



## Review Article

# Inflation Impact on the Primary Food Products - Emerging Trends and Determinants

S. S. Jeyaraj

Sino-British College, GXUN Business School, Guangxi University for Nationalities, Nanning, China

### Email address:

[jeyarajphd@gmail.com](mailto:jeyarajphd@gmail.com)

### To cite this article:

S. S. Jeyaraj. Inflation Impact on the Primary Food Products - Emerging Trends and Determinants. *International Journal of Economics, Finance and Management Sciences*. Vol. 5, No. 1, 2017, pp. 1-14. doi: 10.11648/j.ijefm.20170501.11

**Received:** October 25, 2016; **Accepted:** November 11, 2016; **Published:** December 12, 2016

---

**Abstract:** India and its average food inflation during the period 2006-2013 was one of the highest among emerging market economies, and nearly double the inflation witnessed in during the previous decade. Present paper, I analysed the trend and major drivers of inflation factors for the food inflation. Study is both descriptive and analytical and entirely based on secondary data obtained from different published sources, authenticated source have been chosen without any personal bias. Analyze the data, percentages, growth rate and compounded annual growth rate were used to examine the major drivers of inflation and Ordinary Least Square Method and Trend analysis was used to calculate year over year growth rate. I observed from the analysis of WPI of all commodities was highly variable during the study period due to decadal growth rate showed decreasing trend, population continued to increase and growth of per-capita income has also increased. Despite declines in monthly Per Capita Consumer Expenditure, expenditures on food had increased which indicates a higher demand food in both urban and rural areas. Finally, results suggest that government should take effective measures to reduce the population, new economic policy which increased the demand for variety of food products and increase the agriculture productivity with low cost inputs.

**Keywords:** Monetary Policy Rules, Price Stability, Consumer Price Index, Central Bank, Inflation, Wholesale Price Index

---

## 1. Introduction

Over the past few years, food items and its prices are increasing at an alarming rate, not only locally but also globally, and this increase in prices is termed “economically” as Food Inflation. Inflation is defined as the continuous and persistent is in the general price level, that is, on average all price must increase. Growing food prices have been a major apprehension in India, with food inflation averaging 10% between April 2007 and December 2013. It peaked at over 20% in late 2009, and was rarely at comfortable levels during this period. This was a decisive shift as the food inflation over the previous five years had averaged only 3.6%. With 22% of the population living below the poverty line in 2009-10, the persistence of food inflation at high levels is extremely undesirable. A person spends a significant proportion of their income on food and is unable to redirect additional expenditure to food to counterbalance the effect of food inflation. Thus, high food inflation aggravates nutrition

deficiency, which is already at a very high level in India.

In India, food prices has started increasing since mid 2008 and of late, high inflationary pressure particularly double digit food inflation since October 2008 is turning out to be a spoilsport in an otherwise robustly growing Indian economy. The year 2010-11 witnessed overall inflation rate crossing 10% for the whole year. Inflation based on year wholesale price index (WPI) of primary food articles, still rules high at above 10% (in November 2011). Several factors like drought-induced shortages in food supply, rising international prices, various tiers in the value-chain are deemed to be the major reasons for food inflation in India. Greater government spending leading to increased money supply, structural changes in demand patterns, etc. are being cited as some other major reasons behind this high food inflation. This consistently rising inflation has resulted in a growing concern among policy makers, industry captains, bankers as well as the common man. Food inflation has become a major cause of concern for the common-man.

During January 2012, inflation shot through the roof of

touch an 11 year high of 17.9% and the year 2011 also saw inflation at a negative rate, ironically, food inflation roaring to its maximum level. The wholesale food prices in India touched a 10 year high with food inflation coming at 18.21% for the week ended March 25, 2012. “Unlike in many advanced economies, food inflation has had a non-trivial impact on aggregate retail inflation in India (Anand and others, 2014; Walsh, 2011), reflecting several causes, notably: (i) High share of food expenditure in total household expenditure and correspondingly high weight in the CPI; (ii) Inflation expectations which are anchored by food inflation; and (iii) Wage indexation to consumer price inflation and thereby indirectly to food inflation [1].”

“The importance of these factors in shaping India’s inflation dynamics and determining the conduct of monetary policy, particularly the presence of large second-round effects of food price shocks, has been documented previously (Anand et. al, 2014; RBI, 2014a). However, there is no consensus on the possible drivers of persistently-high food inflation in India. The relative importance of demand and supply factors and the role of related non-monetary policies notably the role of minimum support prices (MSP) and Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) is still debated [2] [3].”

“Gokarn (2011) in his comprehensive analysis of India’s key food price issues since the 1960s concludes that when food prices rise while supply stagnates or fails to keep up, there is no alternative to curbing food inflation often than raising supply rapidly[4].” “Sonna et al (2014) provide additional evidence of the significance of demand forces driving India’s food inflation, showing that rising real rural incomes to have had the largest impact on food inflation, with a relatively smaller impact of cost push factors. While many studies have investigated demand and the supply of key food commodities in India and projected demand and supply scenarios, even at commodity level, analysis of food prices in an equilibrating demand-supply framework is practically non-existent [5].”

Food price inflation also decreases the welfare levels of most households, especially the poorer ones, for whom food consumption constitutes a relatively large share of total expenditures. Beyond this, it simulates the impact of food price increases on household welfare and the potential of adjustments in consumer and producer behavior for mitigating the negative impact on welfare; and assesses the potential impact of regional trade liberalization on food prices. Wholesale Price Index (WPI) which remained persistently high throughout 2011 due to increase in global commodity prices and high crude oil prices has started showing signs of moderation and it is expected to touch 6.5 to 7 percent during the financial year 2012. It also suggests numerous options to contain inflation and to maintain overall price stability ahead.

Both the government and the Reserve Bank of India (RBI) have taken a number of steps to address the issue of high inflation. Liberalization of imports, banning export and a cut in excise and customs duties are some of the many steps initiated by the government to control inflation in the country.

As part of the monetary policy review stance, the RBI has taken suitable steps with consecutive increases in policy rates and related measures to moderate demand to levels consistent with the capacity of the economy to maintain its growth without provoking price rise. These measures included increasing repo rates, the Cash Reserve Ratio (CRR) and reducing the rate of interest on cash deposited by banks with the RBI. This paper represents the inflationary scenario for food products during the study period with the major cause’s impact and measures taken by Indian government to contain food inflation.

## 2. Theoretical Framework

The important selected theories can be classified into demand-pull and cost-push inflation theories which are causes of rise in the general price level.

*Excess Demand or Demand-Pull inflation Theories:* One main branch of inflation theory runs in terms of generalized excess demand, sometimes loosely described as “too much money chasing too few goods. “According to this theory the reason for rise in general price level is increase in demand over supply at existing price [6].”

*Classical Theory of Inflation:* “The Quantity Theory was discussed by the famous 18<sup>th</sup> century Philosopher and economist David Hume and has been advocated more recently by the prominent economist Milton Friedman. Quantity theory emphasizes that the increase in money supply is the principal cause of inflation. In this analysis the aggregate supply is assumed to be fixed and there exists full employment. An increase in the money supply will increase aggregate purchasing power. This will create an excess demand for goods, bidding up their prices in equal proportion to the original increase in the money [7].”

*Keynes Theory of Inflation:* Keynes made a deviation from classical view, when he expressed his view on inflation in his book *How to pay for the war* (1940). “According to Keynes when aggregate demand exceeds aggregate supply at full employment level, inflationary gap arises. He defined inflationary gap as an excess of planned expenditure over the available output at pre-inflation or base price. The inflationary gap generates only money income without creating matching real output because the economy is in full employment equilibrium. The rise in money income would create multiplier effect depending on the Marginal Propensity to Consume (MPC). Since the economy is in the state of full employment and additional goods and services would not be forth coming, the multiplier would work only on the money income. The prices would therefore rise till the entire extra money income and excess demand are absorbed by the rise in the general price level [8].”

*Bent Hansen’s Excess Demand Inflation Theory:* “Bent Hansen’s dissertation, *A study in the Theory of Inflation*, was published in 1951 and attracted international attention. Hansen’s inflation model can be regarded as further development of the inflationary gap model. He differentiated between a goods gap and a factor gap. The goods gap is

responsible for increase in price level while factor gap involves an increase in money wages. The actual speed of inflation, Hansen observes, will depend on the absolute sensitivity of wage and price changes to the size of relevant gaps. If both are relatively volatile, inflation will be rapid; if both are relatively sluggish, inflation will be slower [9].”

*Sectoral-Demand Shift Theory (Ratchet Inflation):* “Sectoral Demand Shift Inflation was put forward by C.L. Schultez in his paper titled “Recent Inflation in the United States”. In his paper he pointed out that the inflation in the U.S.A during 1955 to 1957 was neither due to Cost Push inflation nor the Demand Pull Inflation but by sectoral shifts in demand. According to Schultz prices and wages are flexible upward in response to excess demand but they are rigid downward. Even if the aggregate demand is not excessive, excess demand in some sectors of the economy and deficient demand in other sectors, will still lead to a rise in the general price level. This is because prices do not fall in the deficient-demand sectors, there being downward rigidity of prices. But prices rise in the excess demand sectors and remain constant in the other sectors. The net effect is an overall rise in the price level [10].”

*Structural Inflation:* “The structuralist school of South America base itself on certain structural rigidities and social tensions as the prime cause of inflation in developing countries. According to Robert De Oliveria Campos the structural school stresses the structural vulnerability of (developing) economies because of two basic rigidities. The first one is the slow and unstable rate of growth which is chronically inadequate to support the needed rate of development; the sluggish growth rate makes necessary a continuous and sharp effort of import substitution, creating a cost-push because of the substitution effort itself. The second one is the inelasticity of agricultural production, due largely to defective patterns of land tenure which decrease the responsiveness of food production to price stimuli. The cost push in developing economies would thus come from a fourfold direction; cost of import substitution; rise in agricultural prices; deterioration of the terms of trade; and exchange rate devaluation [11].”

### 2.1. Statement of the Problem

In India, the persistence of food inflation will bring social unrest because food have major share in consumption basket of every Indians. Some people spend 80 per cent of their income on food. High food prices will reduce the consumption resulting in malnutrition and hunger. Poor and vulnerable sections of the population are affected more by the sustained growth in the prices of food. In India, poor and even the lower middle class people’s income remain same so when food price rises they find difficult to spend more on food, education and health which will likely to deteriorate the human capital. India was experiencing robust economic growth for the past few years and high food prices have become an obstacle for it. The food inflation has become a serious cause of concern and at the same time controlling it is a major challenge for policy makers and RBI. Food prices fluctuated sharply during

1994-95 to 1998-99. Later from 1999-00 to 2004-05 the prices stayed low. However from 2006-07 onwards the food prices started to increase and remains elevated. The price of a variety of primary food has been under pressure.

On the basis of WPI with base year 1993-94 inflation in India on a point to point basis was low during 1995-96 to 2003-04 (except 2000-01). Inflationary pressure slowly started to build up from 2004-05. In the year 2008-09 the prices increased by 8.4 per cent and after which fell steeply. However in 2010-11 the upward trend resurfaced and headline inflation almost touched the double digit. All the components of WPI have made significant contribution to aggregate inflation in India. Due to new economic policy and development in secondary sector the contribution made by the Manufactured Non Food Product (MNFP) was very low during 1994-95 to 2010-11. During this period the price of Primary Non Food Article (PNFA) and Manufactured Food Product (MFP) fluctuated highly and their prices increased by 5.6 per cent and 4.6 per cent respectively.

One of the major problems faced by Indian economy in recent years is food inflation. Food prices remain remarkably high despite of measures taken to reduce it. There are several factors which must be taken into account, especially demand-side and a supply-side cause in order to explain what is happening to food prices in India. On the supply side weather, production, export, oil price, speculations and others are the factors which affect the food prices. Economic growth, increase in income, increase in population, change in diet and others are the demand side factors which determine the food inflation. Common problems of inflation due to increase in population, changes in the taste and preference, increase in global food prices, mismatch of demand and supply is to maintain proper inventory, trade liberalization in developed countries and high oil prices. The measures taken by the RBI to reduce the food inflation has decreased the economic growth. Therefore, an attempt is made in the present study to understand the major contributors of food inflation. At the same time effort is taken to identify the supply and demand factors which cause food inflation in India.

### 2.2. Review of Literature

“Bindu (1990) found that in the Indian economy inflation is more of the demand-pull type than the cost push type. As a result rise in prices contribute more to inflation rates than that of wages. Wages on the other hand more influenced by the trade union movements and their bargaining power than by the employment rates. Moreover there is excess supply of labour due to the growing population resulting in the rising unemployment rates. As the three variables inflation, unemployment, wage rise influence of one variable on the other is very negligible and hence a trade-off between inflation and unemployment and between rate of change in money wage rate and rate of unemployment is not possible. Therefore the Philips curve is not irrelevant to the Indian contest [12].”

“Barman, *et.al* (1994) tested empirically the accuracy of forecasts of ARIMA model and five selected univariate non-linear time series models on data relating to wholesale

price index and its subgroups. It has been found that some of the non-linear models generate forecast with satisfactory level of accuracy for lead periods up to 12 months. The study suggested that Self Exciting Threshold Auto Regression (SETAR) model performs well for most of the series for lead periods above 3 months. Box Jenkins, Bilinear and state dependent model gave higher forecast accuracy for shorter lead periods up to 3-4 months. Bilinear model generates good forecasts even for higher lead periods. However, it is difficult to say that any single method performs uniformly better than others in all cases [13].”

“Gaur (1996) tried to highlight whether there is any relationship between price and wage/pay. The study reflected the picture that wage/salary has been increasing on political /election considerations. Besides, strong unions are able to win their demand of increase in wage/salary. Pay commission do not consider the conditions of our country. They recommend pay revision in accordance with political guidance. This situation is unsound for stable economic development. Prices should be checked and controlled to achieve the target of “growth with stability”. All the economic decisions should be based on rationality of economic laws. If political and emotional factors are included in national economic policy decisions the country as such is likely to suffer from such irrational decisions [14].”

“Samanta and Mitra (1998) in their study indicated that there has been some strong evidence of growing divergence between the wholesale and consumer prices (after adjusting for increasing level/ trend) in India since May 1995. They found that while data support the existence of a stable long-run relationship (co-integration) between the CPI Industrial Worker (CPIIW) and WPI during April 1991 to April 1995, the relationship is distorted thereafter. Even the short-run relationship is disturbed since May 1995 [15].”

“Khundarppam (1999) in his study questions the argument that Government is indifferent to inflation since it improves the buoyancy of revenue more than it affects the elasticity of expenditure and narrows the fiscal gap employing a partial equilibrium framework for the period 1970-71 to 1997-98. The results indicate that inflation would enlarge the fiscal gap except in the unlikely case inflation enhancing growth. The best policy option when the fiscal gap overshoot the target is to keep inflation stable and activate discretionary fiscal actions [16].”

“Malik and Chowdhury (2001) used co-integration and error correction model to examine the relationship between inflation and GDP growth for four south Asian countries (Bangladesh, India, Pakistan and Srilanka) and found two interesting results. First, inflation and economic growth are positively related. Second, the sensitivity of inflation to changes in growth rates is larger than that of growth to changes in inflation rates. These findings have important policy implication. Contrary to the policy advice of the international lending agencies, attempts to reduce inflation to very low level (or zero) are likely to adversely affect economic growth. However, attempts to achieve faster economic growth may over heat the economy to the extent that the inflation rate

becomes unstable. Thus these economies are on knife edge. The challenge for them is to find a growth rate which is consistent with a stable inflation rate, rather than beat inflation first to take them to a path of faster economic growth. They need inflation for growth but too fast a growth rate may accelerate the inflation rate and take them downhill [17].”

“Kirsten, *et.al* (2002) reports on a study that investigated the increase in food prices in South Africa. It is set against the scenario of an increasing inflation rate since September 2001. The June 2002 STATSSA (Statistics of South Africa) figures estimated the annual inflation rate (Consumer Price Index excluding interest rates on mortgage bonds- CPIX) at 8.8 per cent with food inflation being the major contributor with an annual increase of 14 per cent. The high unemployment and poverty rate in South Africa has already led to concerns about the negative impact of these increases on the cost of living for the poorest. In study they showed that the sharp depreciation of the exchange rate towards the end of 2001 had a major impact on the producer price of maize – one of the key agricultural commodities because of its role as a staple food and as an input in the production of white and red meat and other animal products [18].”

“Otero and Ramirez (2003) in their study estimated an inflation model for Colombia in terms of disequilibria in the monetary sector, the foreign sector, and the labour sector. The model was also used to study the potential effect on inflation of the creation of an independent central bank, granted through the constitutional mandate of 1991. They found that the domestic factors were a far more power full influence on inflation than are external factors. Further they found that the creation of an independent central bank did change some of the parameters of the model, as the disequilibria in goods and monetary markets were found to have a larger effect on inflation before Central Bank Independence was granted [19].”

“Ogbokor (2004) analyzed the impact on growth performance through a case study of Namibia. He found that inflation could have a negative repercussion on growth, especially, if not controlled. The study also observed that imported inflation is visible in the Namibia because Namibian economy depends heavily on imported items from other countries such as South Africa and United Germany. Further the study recommended appropriate anti-inflationary measures for the Namibian economy. A further study on how to minimize the negative repercussion of inflation on the economy of Namibia is highly recommended [20].”

“Ahmed and Mortaza (2005) used annual data set on real GDP and CPI for the period of 1980 to 2005 and conducted an empirical analysis of the present relationship between inflation and economic growth in the context of Bangladesh. The study found that there exist a statistically significant long-run negative relationship between inflation and economic growth for the country as indicated by a statistically significant long-run negative relationship between CPI and real GDP. In addition, the estimated threshold model suggests 6 percent threshold level (that is structural breakpoint) of inflation above which inflation adversely affects economic

growth. These results have important policy implications for both domestic policy makers and the development partners [21].”

“Chen, *et.al* (2006) used nonlinear flexible regression model to investigate the relationship between inflation and inflation uncertainty for the four dragon economies of East Asia: Taiwan, Hong Kong, Singapore and South Korea. Two hypotheses are examined. First, increased inflation raises inflation uncertainty. Second, a high level of inflation uncertainty leads to a higher rate of inflation. They found that except for Hong Kong, over whelming statistical evidence is in favour of first hypothesis. At the same time, convincing evidence is found for second hypothesis in favour of all four economies. The study suggested a strong commitment to stabilize the inflation rate should be the first policy that is adopted when there are inflationary shocks, identify a target rate of inflation so that they can minimize inflation uncertainty and reduce economic harm and discretionary expansion policies should be carefully conducted and opined when the inflation rate is high, such as when future oil prices go rampant, individuals think the policy makers will not curb the inflation rate and this will create greater inflation uncertainty [22].”

“Calvo, *et.al* (2007) developed a model of optimizing forward-looking staggered price setting where even fully credible disinflation displays a delayed and gradual inflation response and significant output losses. There is a welfare trade-off between these output losses and the gains from smaller inflationary distortions. For reasonable parameter values disinflation improves welfare, and more so if it is phased in gradually. Their pricing assumption of model yields dynamics that are similar to models of sticky information, but its state space is much simpler, thereby allowing for the application of standard linearization methods [23].”

“Bhattacharya, *et.al* (2008) applied standard seasonal adjustment procedure in order to obtain a point-on-point seasonally adjusted monthly time series of inflation in India. In three interesting high inflation episodes -1994-95, 2007 and 2008, they found that the data yields a faster and better understanding of inflationary pressures. The point-on-point seasonally adjusted data examined in the study will play useful role in the effort of forecasting inflation and thus supporting the effort of monetary policy reforms [24].”

“Baek and Koo (2009) found that the agricultural commodity prices and exchange rate play key roles in affecting the short and long-run behavior of U.S food prices. It was also found that in recent years, the energy price has been a significant factor affecting U.S. food prices in the long-run, but has little effect in the short-run. This implies the strong long-run linkage between energy and agricultural markets has emerged through production of commodity-based ethanol in the recent years. An important implication of the findings is that, since the exchange rate has a sizeable effect on the agricultural commodity price and thus food price, the uncertainty about commodity prices could increase as the value of the U.S. dollar fluctuates against currencies of other

major trading partners. Another important implication is that as long as bio-fuel production continues using farm commodities, agricultural commodities and food prices are expected to remain high in the future [25].”

“Porter (2010) investigated the drivers of inflation in China. Chinese inflation, particularly non-food inflation, has been surprisingly modest in recent years. The study revealed that supply factors, including those captured through upstream foreign commodity and producer prices have been important drivers of non-food inflation, as has foreign demand for Chinese goods. Domestic demand and monetary conditions seem less important, possibly reflecting a large domestic output gap generated by many years of high investment. Inflation varies systemically within China, with richer (and urban) provinces having lower, more stable, inflation, but this urban inflation also influence that in lower-income provinces. Higher Mainland food inflation also raises inflation in non-Mainland China [26].”

“Pratima (2011) analyses trends in inflation over the past five years, particularly food inflation, and examines the demand and supply side factors behind surging food prices. According to the study demand for several food items in India exceeds their current supplies, and leads to high prices. It further contends that this demand-supply imbalance is attributable to structural inefficiencies, including distribution of food products. Pointing out that monetary policy responses are unlikely to prove effective in reducing food prices, the study emphasises on the importance of increasing agricultural productivity and reforming retail trade policies for long-term results [27].”

“Gulati and Saini (2013) using a linear regression framework showed that the three factors i.e. fiscal deficit, rising farm wages and transmission of the global food inflation together accounted for 98 per cent of the food inflation in India during 1995-96 to December, 2012. Among the three factors, fiscal deficit with the coefficient of 0.46 with one year lag was the most prominent, followed by farm wages with the coefficient of 0.32 with one year lag and 0.30 for global food prices, respectively [28].”

### 2.3. Objectives and Scope of the Study

The study examines the trend in inflation and attempts to identify the major drivers of inflation. The study also analyses the change in food prices over the periods and seeks to discover major drivers of food inflation. Hence, the study would be of much useful to the reader and policy makers to better understand the problem and also to go for the further studies. By using WPI with base year 1993-94 the study analyses change in the price of commodities from 1994-95 to 2010-11. The specific objectives are the following:

To analyse the trend and major drivers of food inflation price over the past years.

To examine the demand and supply side factors behind surging food prices and

To offer valuable suggestions for control stable food inflation.

## 2.4. Methodology

The present study analysed the trend and major drivers of inflation and the factors that are responsible for the food inflation especially in India. Hence the study is both descriptive and analytical. The secondary data collected from Report of Office of Economic Advisor, Ministry of Commercial Industries, Reserve Bank of India Bulletin (various issues), National Sample Survey Organisation Reports and Directorate of economics and statistics.

## 2.5. Statistical Tool Used

Analyze the data, statistical tools like percentages; growth rate and compounded annual growth rate were used. Pictorial representation was used at appropriate places; weighted contribution method was used to examine the main drivers of inflation. Year over Year growth rate was determined in respect of major groups. Each major group's growth rate was multiplied by its weights. Ordinary Least Square Method and Trend analysis was used for the present study.

The equation of the straight line is  $Y_c = a + bX$ .

$$a = \sum Y/N = 175.8$$

$$b = \sum XY / \sum X^2 = 8.9$$

Hence the equation of the straight line trend is  $Y_c = 175.8 + 8.9X$ .

## 3. Results and Discussion

This Chapter deals with the revision of weights of WPI for all commodities, the major contributors of food inflation and the causes of food inflation in India.

**Table 1.** Revised WPI with Weights (2004-05=100).

Major Groups/Groups	2004-05	1993-94
All Commodities	100.0	100.0
I Primary Article	20.1	22.0
A) Food Article	14.3	15.4
B) Non-Food Article	4.3	6.1
C) Minerals	1.5	0.5
II Fuel and Power	14.9	14.2
A) Coal	2.1	1.8
B) Minerals	9.4	7.0
C) Electricity	3.5	5.5
III Manufactured Products	65.0	63.8
A) Food Products	10.0	11.5
B) Beverages, Tobacco & Tobacco Products	1.8	1.3
C) Textiles	7.3	9.8
D) Wood and Wood Products	0.6	0.2
E) Paper and Paper Products	2.0	2.0
F) Leather and Leather Products	0.8	1.0
G) Rubber and plastic Products	3.0	2.4
H) Chemicals and Chemicals Products	12.0	11.9
I) Non-Metallic and Mineral Products	2.6	2.5
J) Basic Metals, Alloys and Metal Products	10.8	8.3
L) Machinery and Machine Tools	8.9	8.4
M) Transport Equipment and Parts	5.2	4.3

Source: Office of the Economic Adviser, Ministry of Commerce & Industry (<http://eaindustry.nic.in/>)

The Table 1 indicates the revision of Wholesale Price Index (WPI) from 1993-94 to 2004-05. The new series of WPI is based on the recommendation of the Working Group headed by Planning Commission member Abijit Sen. The table facilitates the comparison of weights of two base years. All commodities (AC) are divided under three groups namely Primary Article (PA), Fuel and Power (F&P) and Manufactured Products (MP). These major groups are again divided into Groups and Sub-Group.

In the revised weights (2004-05=100) Primary article weights decreased from 22.0 per cent to 20.1 per cent. The weight for manufactured and fuel and power increased by 1.2 per cent and 0.7 per cent respectively. The point to be noted is that the combined weight of food (primary food articles and manufactured food items) in the WPI has come down to 24 per cent and 26.9 per cent in the old base 1993-94. This appears to be inconsistent because food have major share in consumption basket of Indians.

**Table 2.** WPI and its Growth Rate of all Commodities (Base Year-1993-94).

Sl. No	Year (1)	All Commodities (2)	Growth Rate (3)
1	1994-95	112.6	-
2	1995-96	121.6	8.0
3	1996-97	127.2	4.6
4	1997-98	132.8	4.4
5	1998-99	140.7	5.9
6	1999-00	145.3	3.3
7	2000-01	155.7	7.2
8	2001-02	161.3	3.6
9	2002-03	166.8	3.4
10	2003-04	175.9	5.5
11	2004-05	187.3	6.5
12	2005-06	195.6	4.4
13	2006-07	206.2	5.4
14	2007-08	215.7	4.6
15	2008-09	233.9	8.4
16	2009-10	242.9	3.8
17	2010-11*	267.1	10.0
18	CAGR	-	5.2

Note: \*2010-11 WPI was spliced to 1993-94 base year.

Source: Office of the Economic Adviser, Ministry of Commerce & Industry (<http://eaindustry.nic.in/>)

Table 2 furnishes the WPI and annual year percentage growth rate of headline inflation in India. It points out the changes in headline inflation from the year the 1994-95 to 2010-11. Table supplies the information about the movement of prices of AC during the study period.

In the year 1994-95 the WPI was 112.6 which increased to 267.1 in the year 2010-11. Calculated compound average growth rate (CAGR) of headline inflation was 5.2 per cent. Beginning of the study period inflation in India fluctuated at lower rate between 8 per cent and 3.3 per cent. From the year 2008-09 the inflation growth rate was 8.4 per cent which suddenly dipped to 3.8 per cent in the year 2009-10, but again headline inflation began to accelerate in the second half of 2009-10 and reached at the highest in the year 2010-11 with growth rate of 10 per cent. To conclude the WPI growth rate of AC showed a fluctuated trend.

As given in the table 3 AC includes PFA, PNFA, F&P, MFP and MNFP. The table explains the change in prices of these

groups during the study period. WPI of each group is taken from 1994-95 to 2010-11 and its growth rate is calculated.

**Table 3. WPI and its Growth Rate of All Commodities and Major Groups.**

Sl.No	Year (1)	PFA (2)	GR (3)	PNFA (4)	GR (5)	F&P (6)	GR (7)	MFP (8)	GR (9)	MNFP (10)	GR (11)	AC (12)	GR (13)
1	1994-95	112.8	-	124.2	-	108.9	-	114.1	-	110.8	-	112.6	-
2	1995-96	122.2	8.3	135.4	9.0	114.5	5.1	117.8	3.2	122.8	10.8	121.6	8.0
3	1996-97	137.3	12.4	134.2	-0.9	126.4	10.4	124.9	6.0	125.2	2.0	127.2	4.6
4	1997-98	141.4	3.0	137.5	2.5	143.8	13.8	134.6	7.8	130.6	4.3	132.8	4.4
5	1998-99	159.4	12.7	151.8	10.4	148.5	3.3	149.7	11.2	138.5	6.0	140.7	5.9
6	1999-00	165.5	3.8	143.0	-5.8	162.0	9.1	151.3	1.1	143.6	3.7	145.3	3.3
7	2000-01	170.5	3.0	146.5	2.4	208.1	28.5	145.7	-3.7	147.7	2.9	155.7	7.2
8	2001-02	176.1	3.3	152.9	4.4	226.7	8.9	145.4	-0.2	150.6	2.0	161.3	3.6
9	2002-03	179.2	1.8	165.4	8.2	239.2	5.5	153.0	5.2	153.0	1.6	166.8	3.4
10	2003-04	181.5	1.3	186.3	12.6	254.5	6.4	166.7	9.0	158.7	3.7	175.9	5.5
11	2004-05	186.3	2.6	187.6	0.7	280.2	10.1	174.9	4.9	166.7	5.0	187.3	6.5
12	2005-06	195.3	4.8	179.1	-4.5	306.8	9.5	176.8	1.1	174.5	4.7	195.6	4.4
13	2006-07	210.5	7.8	188.2	5.1	323.9	5.6	182.5	3.2	183.4	5.1	206.2	5.4
14	2007-08	222.0	5.5	211.9	12.6	327.0	1.0	190.2	4.2	193.6	5.6	215.7	4.6
15	2008-09	239.9	8.1	235.8	11.3	351.4	7.5	209.3	10.0	206.8	6.8	233.9	8.4
16	2009-10	275.1	14.7	246.8	4.7	343.1	-2.4	244.3	16.7	208.6	0.9	242.9	3.8
17	2010-11*	334.6	21.6	311.2	26.1	415.5	21.1	246.8	1.0	219.4	5.2	267.1	10.0
18	CAGR	-	6.6	-	5.6	-	8.2	-	4.6	-	4.1	-	5.2

Note: PFA- Primary Food ArticlePNFA- Primary Non-Food ArticleF&P- Fuel and Power

MFP- Manufactured Food ProductsMNFP- Manufactured Non- Food ProductsAC- All commodities

GR- Growth Rate

\*2010-11 WPI was spliced to 1993-94 base year

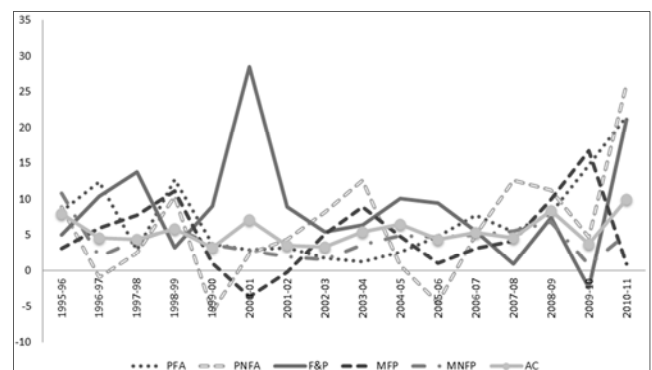
Source: Office of the Economic Adviser, Ministry of Commerce & Industry (<http://eaindustry.nic.in/>)

From the Table-3 it is observed that the growth rate of PFA showed fluctuating trend up to the year 2003-04 and started to increase from 2004-05 and attained double digit growth rates during 2009-10 and 2010-11. In the year 1995-96 the growth rate was 8.3 per cent and 21.6 per cent in the year 2010-11 there by registering 13.3 per cent increase in the growth rate. The calculated CAGR is 6.6 per cent. The PNFA growth rate was varying in the study period. During the years 1996-97, 1999-00 and 2005-06 PNFA was cheap. In the year 2010-11 the growth rate was 26.1 per cent which is the highest in 16 years. The measured CAGR is 5.6 per cent. F&P attained the highest growth rate in the year 2000-01 with 28.5 per cent. The main reason for high growth rate was Y2K problem and growing U.S and world economies. The lowest growth rate was recorded in the year 2009-10 with -2.4 per cent due to economic slowdown. However in 2010-11 the growth rate was 21.1 per cent. There is chance for further increase in growth rate due to rise in oil price because of geopolitical tension in MENA (Middle East and North Africa). CAGR of F&P is 8.2 per cent.

In the case of MFP 16.7 per cent was the highest growth rate in the year 2009-10 and lowest -3.7 per cent in the year 2000-01. PFA and F&P are the main inputs for MFP. So whenever prices of PFA and F&P rise it will increase the prices of MFP. In the year 1998-99 the growth rate of MFP was 11.2 per cent, in the same year PFA growth rate was 12.7 percent and in the year 2008-09 MFP growth rate was 10.0 and F&P was having 7.5 percent. During 2008-09 and 2009-10 MFP was above the PFA growth rate due to persistent of high food inflation and rise in oil prices. However in the year 2010-11 the growth rate decreased to 1.0 per cent. The

calculated CAGR is 4.6 per cent.

When compare to other major groups the variations in the prices MNFP was less. In the year 1995-96 growth rate was 10.8 per cent which gradually decreased to 1.6 per cent in the year 2002-03. From 2003-04 there was increase in the price, in the year 2008-09 it was 6.8 per cent. In the year 2009-10 the growth rate was 0.9 per cent which was lowest in seventeen years. The CAGR was 4.1 percent with CV 62.1. The new economic policy and development in the secondary sector are the major reasons for the low growth of MNFP. From the table it can be conclude that in the beginning of the study period prices of all the group was at high. But later from 1999-00 to 2004-05 the prices declined. Again from 2005-06 onwards prices started to increase. Out of five group F&P and PFA is having high CAGR so they are the major contributors to the headline inflation in India.



**Figure 1. Percentage Growth Rate of all Commodities and Major Groups.**

The Figure 1 explains that among the major groups PNFA was highly fluctuating followed by F&P and MFP. There was no much variation in the case of MNFP. From 2003-04 onwards the growth rate of PFA was increasing at alarming

rate. This shows the persistent of food inflation in India. In the year 2010-11 except MFP all others major groups prices increased which pulled the headline inflation to double digit.

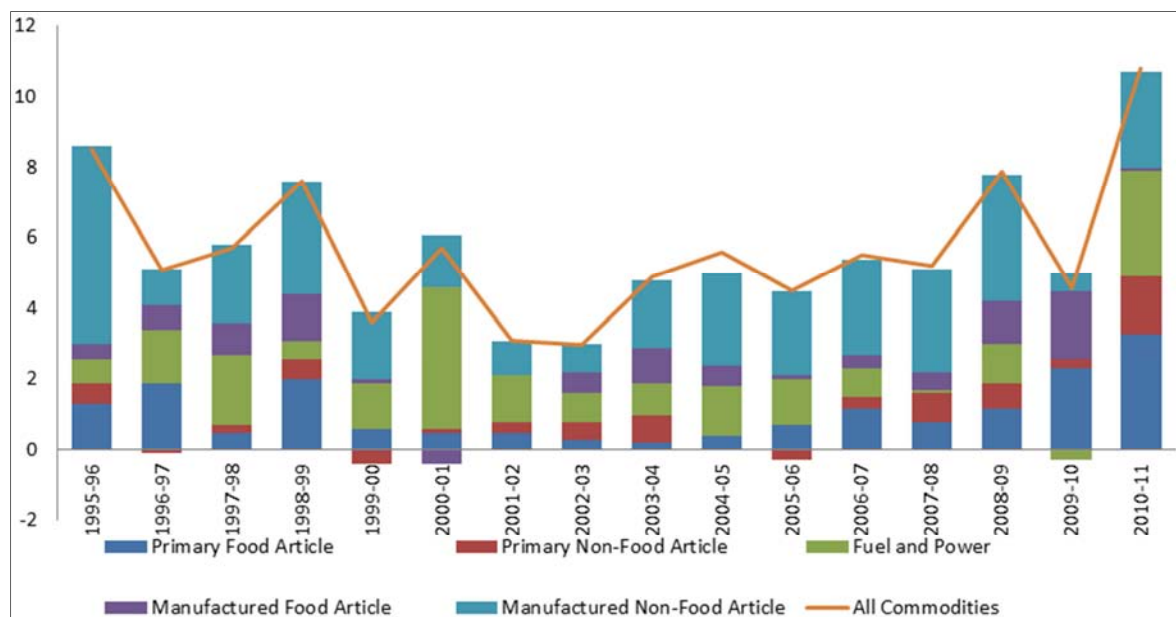
*Table 4. Contributors of Inflation in India.*

Sl.No	Year	Primary Food Article(Wgts-15.4)	Primary Non-Food Article(Wgts-6.1)	Fuel and Power(Wgts-14.2)	Manufactured Food Article(Wgts-11.5)	Manufactured Non-Food Article(Wgts-52.2)	All Commodities(Wgts-100)(3+4+....+7)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	1995-96	1.3	0.6	0.7	0.4	5.6	8.5
2	1996-97	1.9	-0.1	1.5	0.7	1.0	5.1
3	1997-98	0.5	0.2	2.0	0.9	2.2	5.7
4	1998-99	2.0	0.6	0.5	1.3	3.2	7.6
5	1999-00	0.6	-0.4	1.3	0.1	1.9	3.6
6	2000-01	0.5	0.1	4.0	-0.4	1.5	5.7
7	2001-02	0.5	0.3	1.3	0.0	1.0	3.1
8	2002-03	0.3	0.5	0.8	0.6	0.8	3.0
9	2003-04	0.2	0.8	0.9	1.0	1.9	4.9
10	2004-05	0.4	0.0	1.4	0.6	2.6	5.6
11	2005-06	0.7	-0.3	1.3	0.1	2.4	4.5
12	2006-07	1.2	0.3	0.8	0.4	2.7	5.5
13	2007-08	0.8	0.8	0.1	0.5	2.9	5.2
14	2008-09	1.2	0.7	1.1	1.2	3.6	7.9
15	2009-10	2.3	0.3	-0.3	1.9	0.5	4.6
16	2010-11	3.3	1.6	3.0	0.1	2.7	10.8

Source: Researcher calculation

Table 4 indicates major drivers of inflation in India. It provides the percentage of each major group that contributes towards the percentage growth rate of all commodities. With the help of the table it is easy to identify which group has contributed more to the head line inflation in India. In the year 2003-04, 0.2 per cent was the lowest share of PFA towards the total inflation growth. From here onwards the share increased and reached at 3.3 percent in the year 2010-11. The share of PNFA to total inflation was not much significant. Only in the year 2010-11 share went above 1 percent. F&P are the major contributors to the headline inflation. 4.0 per cent was the

highest in the year 2000-01 and -0.3 per cent was lowest in the year 2009-10. After 1.3 percent in 1998-99 contribution of MFA increased in recent years. In 2008-09 and 2009-10 the share was 1.2 percent and 1.9 percent respectively. From 1995-96 the share MNFP started to decrease. During 1996-97 to 2010-11 the share of MNFP hovered below 4 percent. When comparing the weights and percent share to total growth rate MNFP contributes very less towards total inflation. So MNFP is not a major contributor to inflation. The table reveals that the major drivers of inflation are PFA and F&P. Especially in the end of the study period the share of PFA has increased.



*Figure 2. Drivers of Inflation in India.*



The Figure2 describes the major drivers of inflation from 1995-96 to 2010-11. There are a number of important patterns in the graph. The contribution of PFA to overall inflation is steadily increasing from 2004-05. Even though the crude oil prices were increasing gradually the contribution of F&P to inflation was variable. Over the years the share of PNFA was very low but it was striking to note that its contribution

increased in the year 2010-11. The area of MNFP was somewhat steady after 1995-96. However during 2007-08 and 2008-09, as the overall inflation increased so did this component. In the case of MFP share of contribution to total inflation varies. In the year 2009-10 area of MFP was very high and in 2000-01 was below the zero line. So it is clear that food prices are the major drivers of high inflation in India.

**Table 5.** Fitting the Straight Line Trend for Primary Food Article (PFA).

Sl.No	YEAR (1)	PFA (2)	X (3)	XY (4)	X <sup>2</sup> (5)	Trend Value (6)
1	1994-95	112.8	-8	-902.4	64	104.6
2	1995-96	122.2	-7	-855.4	49	113.5
3	1996-97	137.3	-6	-823.8	36	122.4
4	1997-98	141.4	-5	-707	25	131.3
5	1998-99	159.4	-4	-637.6	16	140.2
6	1999-00	165.5	-3	-496.5	9	149.1
7	2000-01	170.5	-2	-341	4	158
8	2001-02	176.1	-1	-176.1	1	166.9
9	2002-03	179.2	0	0	0	175.8
10	2003-04	181.5	1	181.5	1	184.7
11	2004-05	186.3	2	372.6	4	193.6
12	2005-06	195.3	3	585.9	9	202.5
13	2006-07	210.5	4	842	16	211.4
14	2007-08	222	5	1110	25	220.3
15	2008-09	239.9	6	1439.4	36	229.2
16	2009-10	275.1	7	1925.7	49	238.1
17	2010-11	265.7	8	2125.6	64	247
18	N=17	$\sum Y=3140.7$	$\sum X=0$	$\sum XY=3642.9$	$\sum X^2=408$	$\sum Y_c=2988.6$

Source: Office of the Economic Adviser, Ministry of Commerce & Industry (<http://eaindstry.nic.in/>)Researcher calculation

The table 5 indicates the fitting the straight line trend for PFA. The values are plotted in the Figure 4. PFA was above the trend line from 1994-95 to 2002-03. WPI of PFA was almost equal with the trend line in 2003-04. WPI of PFA was below the trend line on 2004-05 and 2005-06 respectively.

After 2006-07 the prices started to increase and in the rest of the years it was well above the trend line. The largest difference between actual index and trend are seen 1998-99 and 2009-10 which are shown in dotted lines. Of these two years, 2009-10 has highest food inflation.

**Table 6.** WPI and its Growth Rate of Primary Food Article and Sub-Groups.

Sl.No	Year (1)	Cereals (2)	GR (3)	Pulses (4)	GR (5)	Fruits (6)	GR (7)	Vegetables (8)	GR (9)	Milk (10)
1	94-95	113.6	-	122.2	-	108.0	-	96.7	-	110.3
2	95-96	120.8	6.3	135.0	10.5	123.5	14.4	126.6	30.9	114.3
3	96-97	135.7	12.3	151.3	12.1	148.9	20.6	154.6	22.1	119.7
4	97-98	138.4	2.0	145.9	-3.6	142.8	-4.1	149.4	-3.4	125.5
5	98-99	150.9	9.0	160.1	9.7	185.4	29.8	147.3	-1.4	136.0
6	99-00	177.8	17.8	166.1	3.7	154.5	-16.7	130.2	-11.6	147.6
7	00-01	173.0	-2.7	179.6	8.1	160.5	3.9	134.7	3.5	163.2
8	01-02	170.1	-1.7	189.2	5.3	188.9	17.7	154.0	14.3	166.2
9	02-03	173.5	2.0	180.6	-4.5	190.2	0.7	166.6	8.2	171.7
10	03-04	176.3	1.6	176.6	-2.2	195.6	2.8	178.8	7.3	176.0
11	04-05	177.9	0.9	174.4	-1.2	204.2	4.4	190.3	6.4	183.6
12	05-06	185.8	4.4	194.9	11.8	218.9	7.2	213.2	12.0	184.3
13	06-07	199.4	7.3	254.2	30.4	228.2	4.2	214.4	0.6	196.0
14	07-08	211.7	6.2	243.1	-4.4	236.2	3.5	227.3	6.0	212.5
15	08-09	230.5	8.9	259.8	6.9	255.5	8.2	261.5	15.0	228.5
16	09-10	261.9	13.6	333.8	28.5	287.2	12.4	277.2	6.0	253.8
17	10-11*	301.5	15.1	343.4	2.9	331.8	15.5	348.4	25.7	323.1
18	CAGR	5.4	-	6.5	-	6.3	-	6.8	-	5.3

Table 6. Continue.

Sl.No	GR (11)	Eggs, Meat Fish (12)	GR (13)	Condiments and Spices (14)	GR (15)	PFA (18)	GR (19)
1	-	116.1	-	126.2	-	112.8	-
2	3.6	125.2	7.8	153.4	21.6	122.2	8.3
3	4.7	145.6	16.3	176.6	15.1	137.3	12.4
4	4.8	161.5	10.9	176.9	0.2	141.4	3.0
5	8.4	169.4	4.9	220.2	24.5	159.4	12.7
6	8.5	174.0	2.7	226.4	2.8	165.5	3.8
7	10.6	186.0	6.9	202.5	-10.6	170.5	3.0
8	1.8	190.6	2.5	188.1	-7.1	176.1	3.3
9	3.3	193.5	1.5	194.0	3.1	179.2	1.8
10	2.5	186.4	-3.7	205.0	5.7	181.5	1.3
11	4.3	194.0	4.1	188.1	-8.2	186.3	2.6
12	0.4	217.4	12.1	176.6	-6.1	195.3	4.8
13	6.3	226.9	4.4	228.2	29.2	210.5	7.8
14	8.4	238.6	5.2	236.6	3.7	222.0	5.5
15	7.5	249.8	4.7	267.7	13.1	239.9	8.1
16	11.1	302.6	21.1	319.8	19.5	275.1	14.7
17	27.3	369.0	21.9	459.2	43.6	334.6	21.6
18	-	6.2	-	6.0	-	6.6	-

Source: PFA –Primary Food ArticleGR- Compound Growth Rate \*2010-11 WPI was spliced to 1993-94 base year Source: Office of the Economic Adviser, Ministry of Commerce & Industry(<http://eaindustry.nic.in/>)

Table 6 points out the changes in the prices of PFA from 1994-95 to 2010-11. PFA is divided into sub groups they are cereals, pulses, fruits, vegetables, milk, egg, fish and meat, condiments and spices and others. From the year 1995-96 to 2004-05 the growth rate of the prices of cereal fluctuated, but during the year 1999-00 it registered the highest of 17.8 per cent in the study period. Cereals remained cheap in the years 2000-01 and 2001-02. But from 2004-05 onwards the prices started to increase at alarming rate. In 2004-05 prices of cereal increased by 4.4 per cent and in 2010-11 by 15.1 per cent, there was 10.7 per cent increase in the prices. The calculated CAGR for cereals was 5.4 per cent.

The growth rates of prices of Pulses were vacillating during the study period. The lowest WPI growth rate was -4.5 percent in the year 2002-03 and highest 30.4 percent in the year 2006-07. Most of the years in the study period prices of pulse remained high. The calculated CAGR for pulses was 6.5 per cent. In the year 1999-00 fruits were very cheap. But in the year 1998-99 fruits price rose by 29.8 per cent which was the highest in the study. For the next five years that is from 1999-00 to 2002-03 the prices of fruit fluctuated and from 2004-05 onwards there was gradually increased. The calculated CAGR for fruits was 6.3 per cent.

After 1995-96 the prices of vegetable decreased and were having negative growth rate during 1997-98 to 1999-00, from 2001-02 the prices of vegetable increased (except in the year 2006-07). In the year 2010-11 the prices of vegetable rose by

25.7 per cent. The calculated CAGR for vegetables was 6.8 per cent. In the beginning of the study period the price of milk was high, from 2001-02 to 2005-06 milk was cheap. But from 2006-07 price of milk started to rise. In the year 1995-96 the WPI growth rate of milk was 3.6 per cent and in the year 2010-11 it was 27.3 per cent. During the study period the price of milk increased by 23.7 per cent. The calculated CAGR for milk was 5.3 per cent.

During the study period prices of egg, meat and fish remained high. In the years 2009-10 and 2010-11 the price increased by 20 per cent. Only in the year 2003-04 egg, meat and fish were cheap. The calculated CAGR for egg, meat and fish was 6.2 per cent. Variation in the prices of condiment and spices can seen from 1994-95 to 2005-06, but from 2006-07 onwards the prices of condiments and spices started to increase at alarm rate. In the year 2010-11 the prices grew by 43.6 per cent. The calculated CGR for condiments and spices was 6 per cent.

From the above analysis it can be concluded that the persistent growth of food inflation can be seen from the year 2005-06 onwards. Before the year 2005-06 the prices of food fluctuated. Another important point to be noted is the prices of all the sub groups under PFA are showed increasing trend after 2005-06. When compare to other sub groups prices of pulse, fruits, vegetable and egg, meat and fish have contributed more to food inflation.

**Table 7.** Contributors of Food Inflation in India.

Sl. No	Year (1)	Cereals (2)	Pulses (3)	Fruits (4)	Vegetables (5)	Milk (6)	Eggs, Meat & Fish (7)	Condiments and Spices (8)	Other Foods (9)	PFA (10)
1	1995-96	0.3	0.1	0.2	0.5	0.2	0.2	0.2	0	1.5
2	1996-97	0.5	0.1	0.3	0.3	0.2	0.4	0.1	0	1.9
3	1997-98	0.1	0	-0.1	-0.1	0.2	0.2	0	0.1	0.5
4	1998-99	0.4	0.1	0.4	0	0.4	0.1	0.2	0	1.5
5	1999-00	0.8	0	-0.3	-0.2	0.4	0.1	0	0	0.8
6	2000-01	-0.1	0	0.1	0.1	0.5	0.2	-0.1	0	0.6
7	2001-02	-0.1	0	0.3	0.2	0.1	0.1	0	0	0.5
8	2002-03	0.1	0	0	0.1	0.1	0	0	0	0.4
9	2003-04	0.1	0	0	0.1	0.1	-0.1	0	0	0.3
10	2004-05	0	0	0.1	0.1	0.2	0.1	-0.1	0	0.5
11	2005-06	0.2	0.1	0.1	0.2	0	0.3	0	0	0.8
12	2006-07	0.3	0.2	0.1	0	0.3	0.1	0.2	0	1.2
13	2007-08	0.3	0	0.1	0.1	0.4	0.1	0	0	0.9
14	2008-09	0.4	0	0.1	0.2	0.3	0.1	0.1	0.1	1.4
15	2009-10	0.6	0.2	0.2	0.1	0.5	0.5	0.1	0	2.2
16	2010-11	0.7	0	0.2	0.4	1.2	0.5	0.3	0	3.3

Source: Researcher calculation

Table 7 indicates major drivers of food inflation in India. It provides the percentage of each sub groups that contributes towards the percentage growth rate of PFA. The above table helps to identify which sub group has contributed more to the food inflation in India. In the beginning of the study period cereals exerted more pressure on the food prices. In middle the contribution decreased. However from 2005-06 onwards the cereals became one of the major contributor towards the high food inflation.

In PFA the share of pulses remained very low during the study period and during the year 2006-07 and 2009-10 the share was 0.2 per cent which was the highest. Fruits contribution fluctuated from 1995-96 to 2001-02, but from 2004-05 onwards the fruits contribution increased.

Contribution of vegetables towards food inflation was high in the years 1995-96 and 1996-97, the next two years it remained low, but from 2001-02 onwards vegetables exerted more pressure on the food price.

It was observed that the contribution of milk towards the food inflation remained high except the years from 20001-02 to 2003-04 throughout the study period. From 1994-95 to 2003-04 the contribution of egg, meat and fish fluctuated and from 2004-05 share has increasing trends. During 2009-10 and 2010-11 share was high with 0.5 per cent. Contribution made by condiments and spices towards food inflation was very low and only in the year 2010-11 share was 0.3 per cent. Other foods that are tea and coffee contribution remained low throughout the study period.

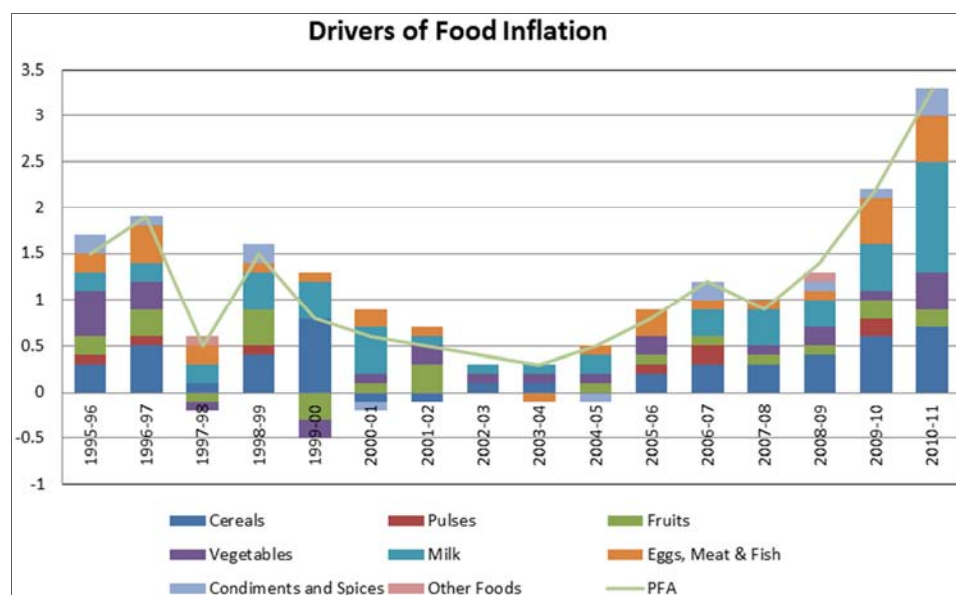
**Figure 3.** Drivers of Food Inflation.

Figure 3 displays the relative contribution made by different food groups to overall food inflation. It can be seen

that before 2003-04 the major contributor was cereals and to some extent fruits. But end of the study period the dominant

contributors to food inflation were milk, egg, meat, fish and fruits. In the years 2009-10 and 2010-11 most of the commodities in the food group made high contribution towards the total food inflation especially milk.

## 4. Findings

The study found that in the revised weights (2004-05=100) primary article weights decreased from 22.0 per cent to 20.1 per cent and the revised WPI the weight for manufactured and fuel and power increased by 1.2 per cent and 0.7 per cent respectively. The combined weight of food (Primary Food Articles and Manufactured Food items) in the revised WPI has come down to 24 per cent from 26.9 per cent in the old base 1993-94. Beginning of the study period inflation in India fluctuated at lower rate between 8 per cent and 3.3 per cent. From the year 2008-09 the inflation growth rate was 8.4 per cent which suddenly dipped to 3.8 per cent in the year 2009-10, but again headline inflation began to accelerate in the second half of 2009-10 and reached at the highest in the year 2010-11 with growth rate of 10 per cent. It was observed from the analysis of WPI of all commodities that the inflation in India was highly variable during the study period.

Among the major groups of WPI, Primary Non Food Article fluctuated highly followed by Fuel and Power and Manufactured Food Product. From 2003-04 onwards the growth rate of Primary Food Article was increasing at alarming rate. It was found that in the year 2010-11 except Manufactured Food Product all other major group prices increased which pulled the headline inflation to double digit.

The contribution of Primary Food Article to overall inflation steadily increased from 2004-05. Over the years, the share of Primary Non Food Article was very low but it was striking to note that its contribution increased in the year 2010-11. However during 2007-08 and 2008-09, as the overall inflation increased so did this component. In the case of Manufactured Food Product share of contribution to total inflation varies. In the year 2009-10 share of Manufactured Food Product was very high and in 2000-01 was very low. So using weighted contribution method it was found that food prices are the major drivers of high inflation in India.

From the trend analysis it was found that in the years 1998-99 and 2009-10 the food prices was at maximum. Especially during the year 2009-10 it registered highest food inflation. The persistent of food inflation can be seen from 2005-06 onwards. Before 2005-06 the prices of food fluctuated. Even though the decadal growth rate showed decreasing trend, in absolute term the population continued to increase. High population growth in absolute term has increased the demand for variety of food article in India putting more pressure on food, feed supply and depleted stocks. This has caused the food prices to rise.

The study found that for the period 1994-95 to 2002-03 the average growth rate was only 4 percent, however per capita income showed robust growth of 7.8 percent from 2003-04 to 2010. Growth of per-capita income has increased the intake level of nutrition and food in India. Due to this demand for

food increased followed by high food inflation in India.

Food expenditure comprises 51.8 percent in 2008-08 of total monthly Per Capita Consumer expenditure for rural population but this proportion dropped from 53.2 percent in 2004-05. For the urban population food expenditure comprise 39.3 percent of the total monthly Per Capita Consumer Expenditure which is slightly lower than the 40.5 per cent share it had in 2004-05. Despite these declines in the shares of food in the total monthly Per Capita Consumer Expenditure, the absolute expenditures on food had increased. The increase in absolute food expenditure indicates a higher demand food in both urban and rural areas.

More detailed break-up by item groups of the monthly Per Capital Consumer Expenditure revealed that all the five of the food items, contributing majorly to food inflation show positive upward trends in both rural and urban India. During the study period the stock maintained by Public Distribution System (PDS) fluctuated highly putting more pressure on the price of food.

### 4.1. Suggestion

The study suggested that the Primary Food Article should be given more weight to get a better picture about food inflation because food items have major share in the Indian diet. India has achieved robust economic growth after new economic policy which increased the demand for variety of food products. Government should take effective measures to increase the supply to meet the demand and reduce the population focusing on small family norms. It is suggested that to meet the growing demand for food products government should go for second green revolution by using innovative thinking. To increase the agriculture productivity low cost inputs like bio-fertilizer, organic farming and good quality of seeds, advanced technological equipments, regulated agriculture markets should be used. Wages of agriculture labourers are increasing due to shortage of supply. Policy must be directed towards attracting more private investment in agriculture, bringing in new technology and raising yields. Losses and waste should be reduced at the time of harvest. Due to increase in per- capita income demand for protein rich foods has increased. To meet the growing demand government should go for a new revolution leading to protein rich food items. One of the major causes of food inflation is drought and during this time proper food management should be carried out that is maintaining buffer stock and timely release.

### 4.2. Conclusion

Present study is based on the aggregate data and it has the limitation of aggregate data. Taking the availability of the published data on macro aggregates the study is limited up to the latest period of 2010-11. Aggregate data are taken at national so the study is limited to the national level. As the study is entirely based on time series secondary data obtained from different published sources, authenticated source have been chosen without any personal bias. However the

limitation interests to the secondary data are to be recognized.

From the study, it was found that the inflation has been driven mostly by price increase of primary goods. It was observed that all of the commodities that the inflation in India was highly variable during the study period from the analysis of WPI. Especially, Primary Non Food Article fluctuated highly followed by Fuel and Power and Manufactured Food Product. In the year 2010-11 except Manufactured Food Product all other major group prices increased which pulled the headline inflation to double digit. With the help of weighted contribution method it was found that food prices are the major drivers of high inflation in India. High population growth in absolute term has increased the demand for variety of food article in India putting more pressure on food, feed supply and depleted stocks. This has caused the food prices to rise. Growth of per-capita income has increased the intake level of nutrition and food in India. Due to this demand for food increased followed by high food inflation in India.

Despite declines in the monthly Per Capita Consumer Expenditure, the absolute expenditures on food had increased. The increase in absolute food expenditure indicates a higher demand food in both urban and rural areas. During the study period the stock maintained by Public Distribution System (PDS) fluctuated highly putting more pressure on the price of food. The major problem faced by Indian economy that related to food inflation is becoming difficult to control it because rise in price is felt on the entire food product. The poor and the vulnerable sections of people spend almost entire income on food and they are affected more by food inflation rather than rich people. This will reduce the protein intake and increase the poverty leading to slow economic growth. Supply of food is not coping up with growing demand. Even if there is good harvest the problem that arises is where to store safely. Ensuring good harvest, RBI effective monetary policy to reduce demand at reasonable level and measures taken by government of India to increase the supply may reduce food inflation. Government of India and RBI should develop a mechanism to detect early signal of food inflation and can control it before getting generalised.

## References

- [1] Anand, Rahul, Ding Ding, and Volodymyr Tulin, 2014, "Food Inflation in India: The Role for Monetary Policy," *IMF Working Paper* 14/178 (Washington: International Monetary Fund).
- [2] Walsh, James, 2011, "Reconsidering the Role of Food Prices in Inflation," *IMF Working Paper* 11/71 (Washington: International Monetary Fund).
- [3] Reserve Bank of India, 2014b, "*Reserve Bank of India Annual Report* 2013-14," August 2014.
- [4] GokarnSubir, 2011, "Food Inflation – This Time it's Different", Kale Memorial Lecture at the Gokhale Institute of Politics and Economics, Pune, 9 December 2011.
- [5] Sonna, Thangzason, Himanshu Joshi, Alice Sebastian, and Upasana Sharma, 2014, "Analytics of Food Inflation in India", *RBI Working Paper*, October 2014, Reserve Bank of India.
- [6] Edward Shapiro, *Macroeconomics analysis*, 3<sup>rd</sup> Edition, Harcourt Brace Jovanovich, inc. 1974, P.409.
- [7] Brain Snowdon and Howard R Vane, *An Encyclopedia of Macroeconomics*, Edward Elgar Publishing, 2002.
- [8] D. N Dwivedi, *Macroeconomics Theory and Policy*, Tata McGraw-hill Publishing Company Limited, New Delhi, 2004, P. 369.
- [9] K. C Rana and K. N Verma, *Macroeconomics analysis*, Vishal Publishing Co, Jalandhar, 2002, P. 584.
- [10] M. L Jhinjan, *Macroeconomics Theory*, 11<sup>th</sup> Revised Edition, Vrinda Publications (P) LTD, 2003, P. 448.
- [11] Mrityunjjoy Banerjee, *Inflation: Causes and Cures*, The World Press Private Limited, Calcutta, 1975, P. 42.
- [12] BinduHima. D, "Inflation and Unemployment in India During 1970-1984: The Relevance of Philips curve", Department of Economics, Stella Maris College, Madras, December 1990, PP. 115-116.
- [13] Barman R. B, Madhusoodanan T. P and Samanta G. P, "Dynamics of Inflation in India and their Modeling by Time Series Analysis", *Reserve Bank of India occasional papers*, Vol-15, No-2, June 1994, PP. 103-123.
- [14] Gaur G. L, "Is Pay Rise Leading to Price Rise", *Economic Affairs*, Vol-41, Qr.2, June 1996, PP. 199-122.
- [15] Samanta G. P and MitraSharmishtha, "Recent Divergence Between Wholesale and Consumer Prices in India – A Statistical Exploration", *Reserve bank of India occasional papers*, Vol-19, No-4, December 1998, PP. 329-343.
- [16] KhundrappamJeevan Kumar, "Why should Government be Indifferent to Inflation", *Reserve Bank of India occasional to Paper*, Vol-20, No-3, winter 1999, PP. 415-427.
- [17] Malik Girijasankar and ChowdhuryAnis, "Inflation and Economic Growth:Evidence from Four South Asian Countries", *Asia-Pacific Development Journal*, Vol-8, No-1, 2001, PP. 123-135.
- [18] J. F. Kirsten, N. Vink, D. Scheepers, F. Meyer, M. Calcaterra and L. Jenkins, "The political economy of food price inflation in South Africa", *Working Paper 2002-02*, Department of Agricultural Economics, University of Pretoria, South Africa, 2002, PP. 3-11.
- [19] Otero Jesus and Manual Remirez "Inflation before and after Central Bank Independence: The case of Colombia", *Journal of development economics*, Vol-79, No-1, Feb-2006, PP. 168-180.
- [20] Ogbokor A Cyril, "Impacts of Inflation on Namibian Growth: An empirical study" *Journal of Applied sciences*, 4(4), 2004, PP. 644-648.
- [21] Ahmed Shamin and Mortaza Md. Golam, "Inflation and Economic Growth in Bangladesh: 1981-2005", *Working paper No 0604*, Bangladesh Bank, December 2005, PP. 1-16.
- [22] Chen Shyh-Wei, Shen Chung-Hua and XieZixiong, "Evidence of a Nonlinear Relationship between Inflation and Inflation Uncertainty: The Case of the Four Little Dragons", *Journal of Policy Modeling*, Vol-30, Issue-2, March/April- 2008, PP. 363-376.

- [23] Calvo Guillermo, CelasumOya and Kumhof Michael, "Inflation Inertia and Credible Disinflation", *Journal of International Economics*, Vol-73, Issue-1, September-2007, PP. 48-66.
- [24] RudraniBhattachary, IlaPatnaik and Ajay Shah, "Early Warnings of Inflation in India", *Working Paper No-2008-54*, National Institute of public Finance and Policy, New Delhi, August 2008, PP. 1-19.
- [25] Beak Jungho and Koo W. Won, "Analyzing Factors Affecting U. S Food Price Inflation", *Centre for agriculture policy and trade studies*, North Dakota state university, September 2009, P. 14.
- [26] Porter Nathan, "Price Dynamics in China", *IMF Working Paper /10/221*, Asia and Pacific Department, September 2010, PP. 3-22.
- [27] AtulGuha, Ashutosh Kr Tripathi, (2014). "Link between Food Price Inflation and Rural Wage Dynamics" *Economic and Political Weekly*, June 28, 2014 (Vol. XLIX Nos. 26 & 27).
- [28] Gulati and Saini (2013), 'Taming Food Inflation in India', *Discussion Paper No. 4*, Commission for Agricultural Costs and Prices, Ministry of Agriculture, Government of India.