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Inflation in India: An Empirical Analysis

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Abstract

High inflation in India has become a major issue with both academics and policymakers. It is one of the biggest hindrances to growth and a major policy challenge for incumbent governments. This paper analyses trends in inflation over the past five years, particularly food inflation, and examines the demand and supply side factors behind surging food prices. It argues that 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 paper emphasises on the importance of increasing agricultural productivity and reforming retail trade policies for long-term results.

Inflation has long been a concept that excites politicians and laymen alike. More than gross domestic product (GDP) growth, it is inflation that affects the common man on a daily basis and therein lies its power. Inflation is defined as a sustained increase in the overall level of prices, eroding the purchasing power of income, increasing the cost of living and lowering the real value of savings.[2] India has five different measures of inflation; the Wholesale Price Index (WPI) and four measures of the Consumer Price Index (CPI), which include the CPI

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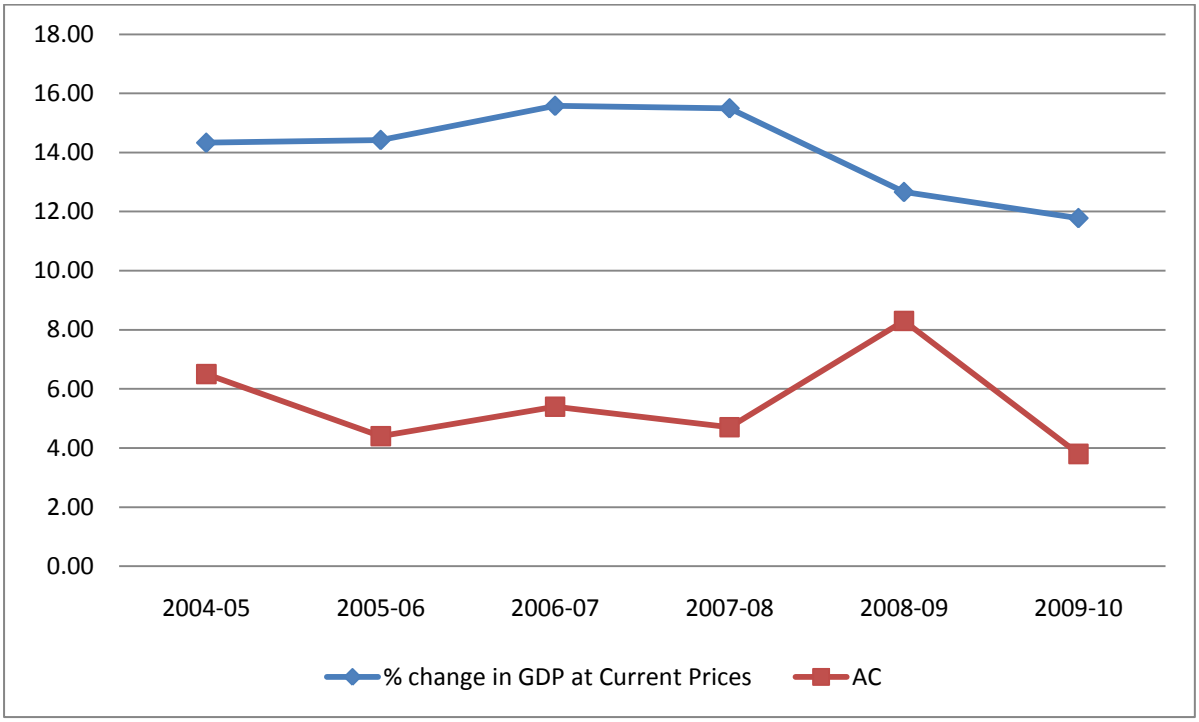
[2] Deepak Mohanty, 'Measures of Inflation in India: Issues and Perspectives', presented at the Conference of Indian Association for Research in National Income and Wealth (IARNIW) at the Centre for Development Studies (CDS), Thiruvananthapuram (9 January 2010), www.bis.org/review/r100125f.pdf. Accessed on 4 April 2011.

for Industrial Workers (IW), for Agricultural Labourers (AL), for Rural Labourers (RL) and for the Urban Non-Manual Employees (UNME). The headline inflation measure in India is the WPI, which measures the change in the average price of goods traded in the wholesale market. The WPI tracks data for a total of 435 commodities (with different weightings) is indicative of the movement in prices of commodities, used in almost all trade and transactions. It is also used because of its easy availability on a weekly basis. Of late, inflation figures in India have been progressively hardening. The year on year increase in WPI in March 2011 was nine per cent while food inflation was 9.5 per cent. Figure 1 shows the percentage change in GDP at current prices plotted with the year on year percentage changes in WPI (All Commodities).

Figure 1: Change in GDP and WPI

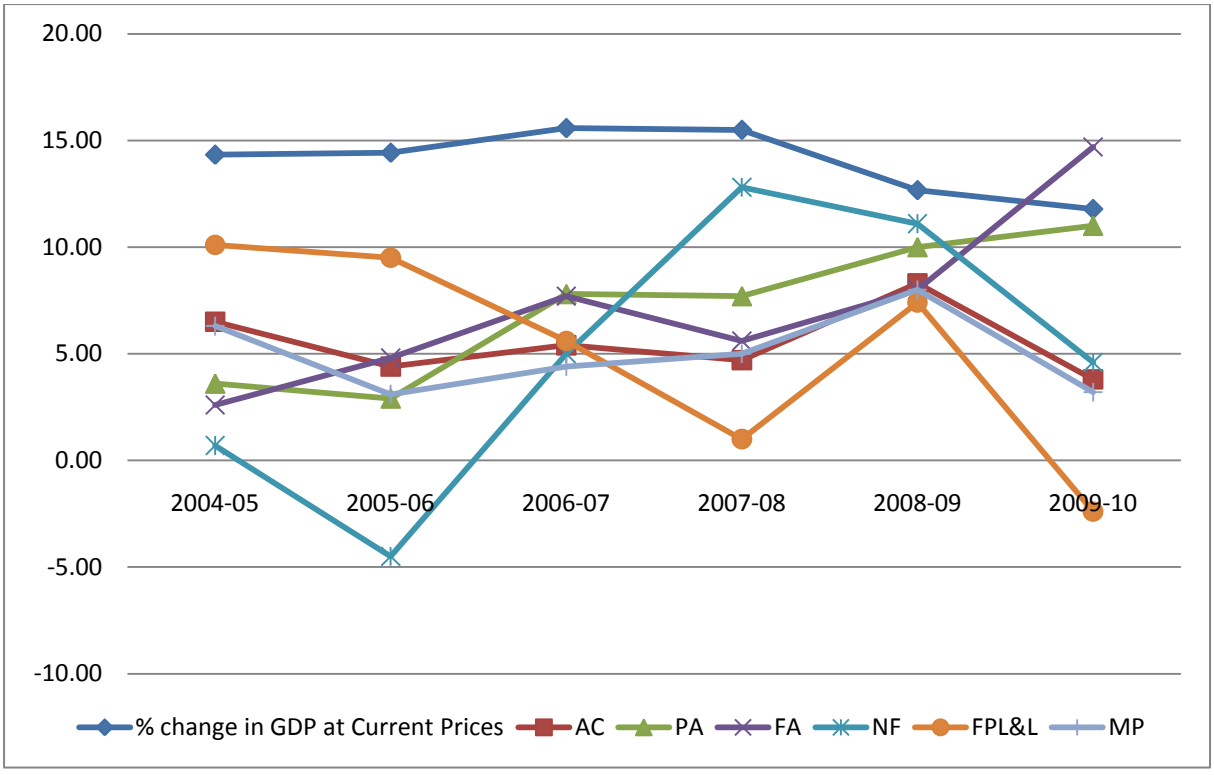


Source: Office of the Economic Advisor, Ministry of Commerce and Industry, http://eaindustry.nic.in/. Accessed on 9 May 2011.

As shown in Figure 1, inflation averaged a little over five per cent for the past five years. From 2004-05 to 2007-08 inflation followed the trend in GDP. This could be a reflection of high growth inducing an increase in prices – a phenomenon that several analysts refer to as the 'growth-inflation' association in India. The sharp rise and fall over the last three years stands out not only because of its large fluctuation but also because it digresses from the GDP trend. To understand this abnormality the All Commodities (AC) WPI is broken up further into its sub-components. These include: primary articles (PA), consisting of food articles (FA) and non-food articles (NF); fuel, power, light and lubricants (FPL&L); and manufactured Products (MP). By plotting these with the change in the GDP it is possible to study which component differs from the trend set by the latter.

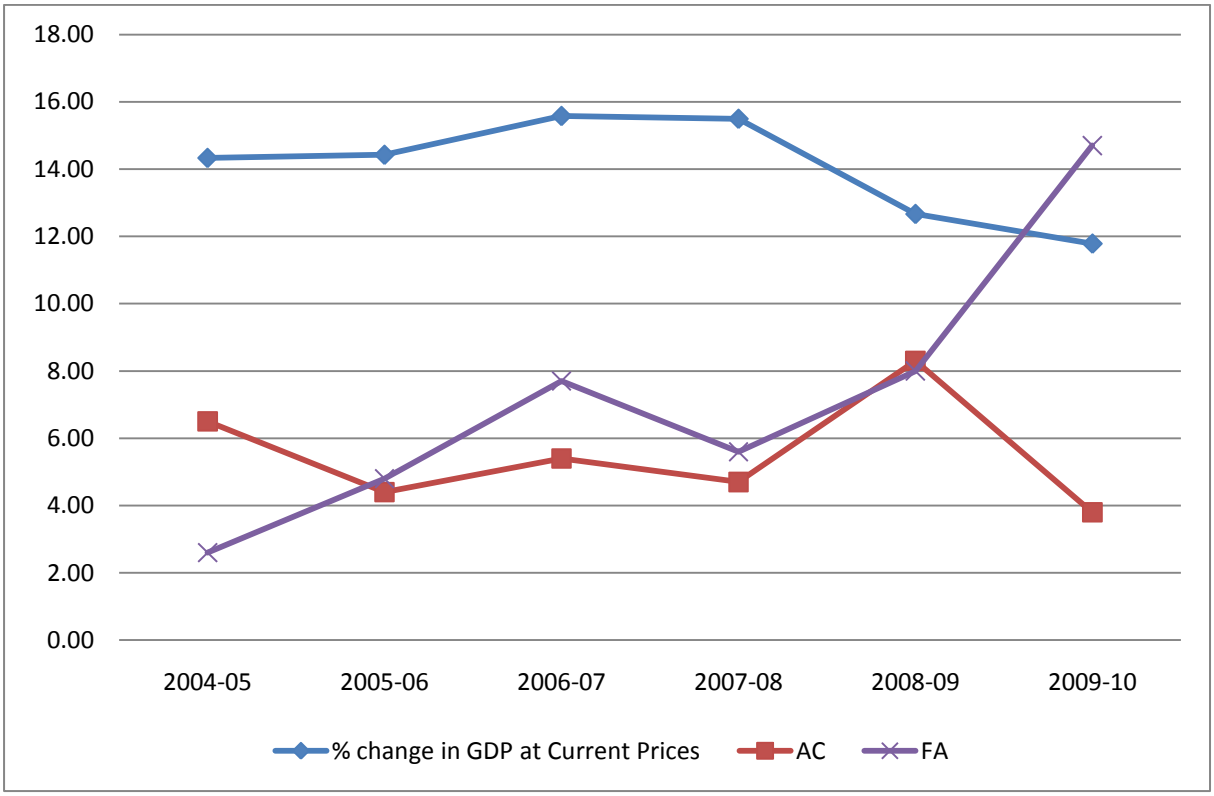
Figure 2 explains the movement of WPI over the last two years a little more clearly. The line representing energy and petroleum resource inflation fluctuates from 2007 onwards, following the pattern of overall inflation and can be attributed to high world prices of natural resources and commodities. The overall inflation is therefore largely 'imported'. Non-food article inflation also varies over the five-year period (shown in Figure 2) but is fairly timid over the last two years and is following the change in the GDP trend. The most interesting observation, though, is the movement of the line capturing the change in food prices over the years. There is a considerable rise in inflation in food articles over the last two years and even more significant is the pattern of rise. Food article prices are seen to change at a rate faster than change in the GDP. These prices rising at an increasing rate is a major contributor to high prices in India and current public discontent. Food inflation has risen at a little over eight per cent on average for the last five years but the sudden 14.7 per cent increase in the last year is striking (Figure 3). Food articles constitute 15.4 per cent of the entire WPI basket. Thus, an in-depth study of food prices is necessary to study inflation in India.

Figure 2: Change in GDP and Components of the WPI



Source: Office of the Economic Advisor, Ministry of Commerce and Industry, http://eaindustry.nic.in/. Accessed on 9 May 2011.

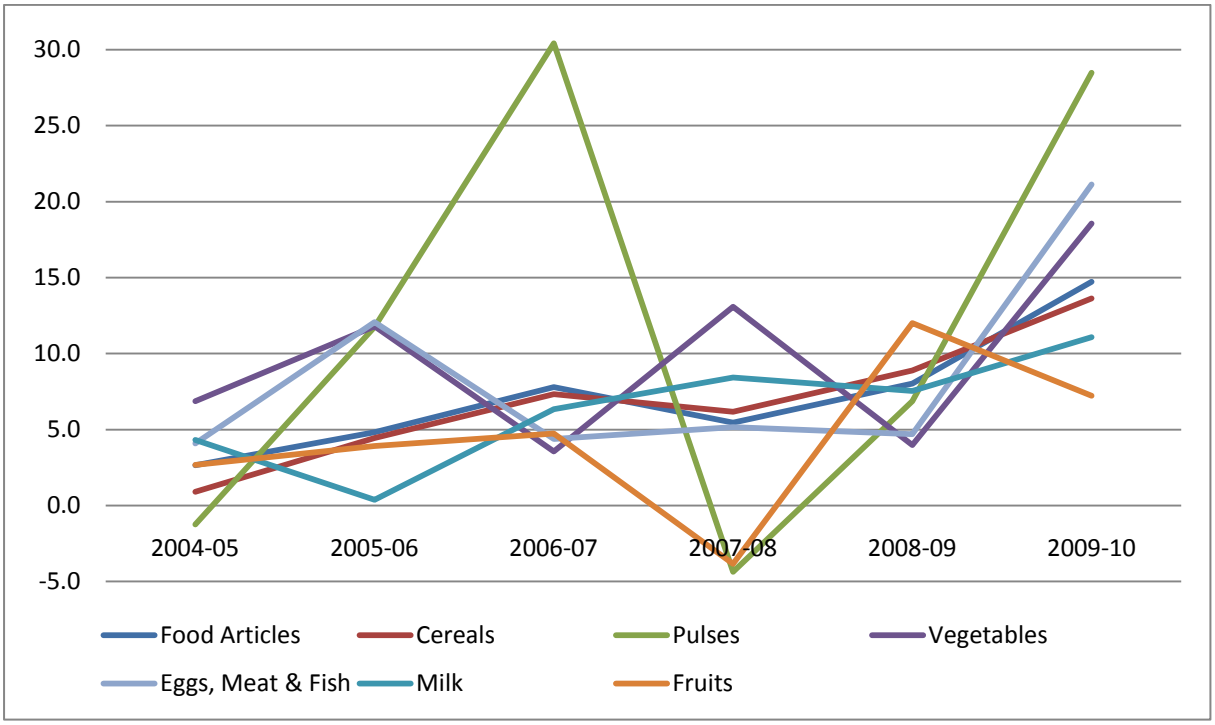
Figure 3: Change in GDP and AC, FA Inflation



Source: Office of the Economic Advisor, Ministry of Commerce and Industry, http://eaindustry.nic.in/. Accessed on 9 May 2011.

Food Articles in the WPI comprise of cereals, pulses, fruits, vegetables, milk, eggs, meat and fish, condiments and spices, and other food articles each with a different weight to help determine its contribution to the WPI. The impact of each of these items on change in WPI depends not only on the amount its price fluctuated over the last two years but also on the percentage weight of the commodity. Eggs, meat and fish are found to contribute the most to food inflation as they account for 2.2 per cent of WPI and the price fluctuation is significant as well. The other influential commodities are vegetables, followed by cereals and milk. Pulses come in fifth as determinants of food inflation since despite having highly volatile prices they account for only 0.6 per cent of WPI (Figure 4). It is noteworthy that except for eggs, meat and fish, all the categories experiencing high inflation constitute the staple diet in India.

Figure 4: Components of FA



Source: Office of the Economic Advisor, Ministry of Commerce and Industry, retrieved from http://eaindustry.nic.in/

Factors Affecting the Price Rise

While examining factors behind high food prices it is important to back up a couple of years, starting from 2004, to identify the reasons. Rising prices are only partially a result of high liquidity and are manifestations of certain structural problems in the economy. The factors behind the structural inefficiencies leading to price rise can be categorised into demand-side causes and supply-side causes.

Of all demand-side factors, income is most crucial. India is an emerging market economy with a high GDP growth rate. High growth rates mean higher incomes which increase propensity to consume and translate into more expenditure. Consumer expenditure from the National Sample Survey Organisation's (NSSO's) latest (2007-08) report on household consumer expenditure in India is used as a proxy to study demand.

Real GDP grew at an average rate of 9.2 per cent during 2004-05 to 2007-08 while the real monthly per capita consumer expenditure (MPCE) (base year 1987-88) was estimated to grow by 8.0 per cent for rural India and by 11.4 per cent for urban India during the same period, as shown in Table 1. Thus, it is seen that as GDP grows, incomes increase resulting in more consumption and expenditure.

Table 1: Growth in MPCE at Current and Constant Prices since 2004-05, All-India

	2004-05	2005-06	2006-07	2007-08
MPCE: rural (₹) (current prices)	579.2	624.5	695.2	763.1
Price deflator for rural sector	319	334	362	389
MPCE: rural (₹) (base 1987-88)	181.6	187.0	192.0	196.2
MPCE: urban (₹`) (current prices)	1104.6	1170.6	1312.5	1463.7
Price deflator for urban sector	338	355	380	402
MPCE: urban (₹) (base 1987-88)	326.8	329.8	345.4	364.1

Source: National Sample Survey Organisation, Ministry of Statistics and Programme Implementation, http://mospi.gov.in/nsso_4aug2008/web/nsso.htm. Accessed on 28 March 2011.

MPCE can be divided into two categories based on the spending characteristic, food expenditure and non-food expenditure (Table 2).

Table 2: Food and Non-Food Components of MPCE, All-India, 2004-05 to 2007-08

		Monthly Per Capita Expenditure (₹)			Per Cent Share in Total MPCE		
Sector	**Year**	**Food**	**Non-Food**	**Total**	**Food**	**Non-Food**	**Total**
Rural	2007-08	395	368	763	51.8	48.2	100
	2006-07	363	332	695	52.3	47.7	100
	2005-06	333	291	625	53.3	46.6	100
	2004-05	308	271	579	53.2	46.8	100
Urban	2007-08	575	889	1464	39.3	60.7	100
	2006-07	517	795	1312	39.4	60.6	100
	2005-06	468	703	1171	40	60	100
	2004-05	447	658	1105	40.5	59.5	100

Source: National Sample Survey Organisation, Ministry of Statistics and Programme Implementation, http://mospi.gov.in/nsso_4aug2008/web/nsso.htm. Accessed on 28 March 2011.

Food expenditure comprises 51.8 per cent of total MPCE for rural population but this proportion dropped from 53.2 per cent in 2004-05. For the urban population food expenditure comprises 39.3 per cent of the total MPCE 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 MPCE, the absolute expenditures on food are increasing. Non-food expenditure is slowly occupying an increasingly larger share in the consumption baskets in both rural and urban areas. This probably reflects proportionally higher weightage of non-food items in the consumption basket and an increase in their prices as well. Regardless, the increase in absolute food expenditure, (seen in Table 2) indicates a higher demand for food in both urban and rural areas.

Tables 3 and 4 give a more detailed break-up by item groups of the MPCE over the four years.

Table 3: Break-Up by Item Group of MPCE, All-India Rural, 2004-05 to 2007-08

Value of Per Capita Consumption in 30 days (₹)_RURAL				
Item	**2004-05**	**2005-06**	**2006-07**	**2007-08**
Cereals	100.7	106.3	114.8	124.1
Gram	0.7	1	1.2	1.1
Cereal Substitutes	0.4	0.4	0.5	0.5
Pulses and their Products	17.2	20	22.7	23.7
Milk and Milk Products	47.3	50.9	56.2	60.2
Edible Oil	25.7	25.5	27.2	33.3
Egg, Fish and Meat	18.6	24.3	24.3	26.3
Vegetables	34.1	37.9	43.1	48.5
Fruits and Nuts	10.4	11.8	12.5	13.6
Sugar	13.3	14.8	14.	12.4
Salt and Spices	13.9	13.2	16.3	17.8
Beverages etc.	25.4	26.1	30.7	42.9
Food Total	**307.6**	**333.2**	**363.4**	**404.3**
Pan, Tobacco and Intoxicants	15.0	15.9	17.7	19
Fuel and Light	56.8	60.4	66.1	75.1
Clothing	39.1	39.3	42.4	49
Footwear	5.9	6.2	6.5	7.3
Misc. Goods and Services	133.1	147.7	172.9	190
Durable Goods	21.7	22	26.2	27.7
Non-Food Total	**271.6**	**291.4**	**331.8**	**368**
Total Expenditure	**579.2**	**624.5**	**695.1**	**772.4**
Price Deflator (43rd Round, 1987-88 = 100)	319	334	362	389
MPCE: Base 1987-88	**181.6**	**187**	**192.0**	**198.6**

Source: National Sample Survey Organisation, Ministry of Statistics and Programme Implementation, http://mospi.gov.in/nsso_4aug2008/web/nsso.htm. Accessed on 28 March 2011.

Table 4: Break-Up by Item Group of MPCE, All-India Urban, 2004-05 to 2007-08

Value of Per Capita Consumption in 30 days (₹)_URBAN				
Item	**2004-05**	**2005-06**	**2006-07**	**2007-08**
Cereals	105.8	109.8	118.8	130.6
Gram	1.1	1.2	1.7	1.8
Cereal substitutes	0.5	0.5	0.5	0.5
Pulses and their Products	22.5	25.6	30.1	31.2
Milk and Milk Products	83.3	84.9	97.5	106.6
Edible Oil	36.4	35	37.5	46.4
Egg, Fish and Meat	28.5	32.3	34.2	39.5
Vegetables	46.8	49.7	56.9	64.3
Fruits and Nuts	23.7	25.5	28	31
Sugar	15.9	17.5	17.3	14.7
Salt and Spices	17.7	17.4	20.5	22.2
Beverages etc.	65.3	68.3	74.4	93.6
Food Total	**447.4**	**467.8**	**517.3**	**582.4**
Pan, Tobacco and Intoxicants	17	17.2	18.6	19.7
Fuel and Light	104.6	109.6	117.4	125.7
Clothing	61.9	63.8	70.3	80.1
Footwear	11.4	11.9	13.1	14.7
Misc. Goods and Services	415.2	453.5	516.7	586.7
Durable Goods	47.2	46.8	59.2	62.2
Non-Food Total	**657.2**	**702.8**	**795.3**	**889.1**
Total Expenditure	**1104.6**	**1170.6**	**1312.5**	**1471.5**
Price Deflator (43rd round, 1987-88 = 100)	338	355	380	402
MPCE: Base 1987-88	**326.8**	**329.8**	**345.4**	**366.1**

Source: National Sample Survey Organisation, Ministry of Statistics and Programme Implementation, http://mospi.gov.in/nsso_4aug2008/web/nsso.htm. Accessed on 28 March 2011.

Expenditure on all items in the consumption has increased over the years, except sugar. A major difference between rural and urban expenditure is the expenditure on miscellaneous goods and services in rural and urban India. This category includes spending on education, medical care, rent and taxes (none of which are included in the WPI), which is bound to be higher in urban India than in the rural areas because of higher living costs in the former. All five of the food items, identified in section one of this paper, contributing majorly to food inflation show positive upward trends in both rural and urban India. These include eggs, fish and meat, vegetables, cereals, milk and milk products, and pulses and their products.

A second demand-side factor leading to the food price rise is changing tastes and preferences and new consumption patterns with increases in consumption levels. The NSSO's report displays data on the percentage share of different food items in consumer expenditure across the population, divided into ten MPCE classes or deciles, starting from the lowest MPCE to the highest.

The share of cereals, pulses and vegetables in total consumption expenditure was higher in rural India than urban India. Both cereals and vegetables follow a similar pattern with changes in income level; percentage share of cereals in consumer expenditure declines from 20.9 per cent (first decile) to 3.9 per cent (tenth decile) and from 27.8 per cent (first decile) to 8.2 per cent (tenth decile) for the urban and rural populations respectively while percentage share of vegetables falls from 7.5 in the first decile to 2.4 in the tenth decile for the urban population and from 8.7 to 4.0 for the rural population. Share of pulses drops from 3.9 to 1.1 for the urban MPCE deciles and 3.8 to 2.1 for the rural MPCE deciles, indicating that the urban poor spent a higher percentage share of their income on pulses than the rural poor but this reverses with increasing income resulting in the rural populations spending a larger share of their income on pulses. It is, thus, observed that cereals, vegetables and pulses are fairly income inelastic, i.e. quantity demanded of these three products (or share of income spent on them) does not significantly increase with an increase in income.

On the other hand, milk, fruits, and eggs, meat and fish display a different story. The share of milk and milk products in expenditure was found to rise with an increasing income in both urban and rural India declining only in the last decile class with the percentage share increasing from 5.8 per cent (first decile) to 7.7 per cent (ninth decile) before falling to 5.6 per cent in the tenth decile for the urban populations and increasing from 2.8 per cent (first decile) to 9.9 per cent (ninth decile) before falling to 8.7 per cent in the last decile for the rural population. This indicates a fair amount of income elasticity and a higher demand for milk and milk products throughout the country. The share of fruits in total consumption for urban populations (rising from 1.0 for the first decile to 1.8 in the tenth) was higher than rural populations (rising from 0.7 in the first decile to 1.9 in the tenth) with the exception of the last decile. Nonetheless, both were positively sloped indicating larger income elasticity in both rural and urban India. The percentage share of eggs, meat and fish for urban populations rises from 3.2 per cent to 3.7 per cent for the first four deciles and then falls to 1.8 in the tenth decile, while its rural counterpart increases from 2.7 to 3.8 per cent for the first nine deciles before falling to 3.3 per cent in the tenth decile. Thus, the urban poor spent a larger share of their expenditure on eggs, meat and fish than their rural counterpart, though the rural rich spent a higher share of their expenditure on the same. The share of consumption expenditure on eggs, meat and fish by rural India is upward sloping, indicating income elasticity. Although the share of spending on eggs, meat and fish in urban India is declining, it has a gradual slope, suggesting more income elasticity than cereals or pulses. It is therefore clear that these foods are superior goods and are still more or less a luxury for many in rural India and as incomes increase the demand for these products will increase as well.

It is from the above analysis that one can spot the changing tastes and preferences of consumers. By studying their spending patterns, it can be concluded that the share of total consumption expenditure is on the rise for food items like milk, eggs, meat and fish and fruits. As the country grows and incomes increase, the demand for these items is going to increase positively, thereby adding to inflationary pressures on these food items. This changing pattern

of consumption could also explain the current rising prices in food, especially for milk and milk products, and eggs, meat and fish.

After examining the two demand-side causes it is necessary to study the supply-side factors affecting rising food prices. An analysis of the output of agricultural goods is undertaken to check for shortages in production.

The Ministry of Agriculture data shows that the production of cereals declined in 2009-10 to 203.6 million tonnes after increasing at 18.7 per cent from 2004-05 (185.2 million tonnes) to 2008-09 (219.9 million tonnes).[3] Production of pulses declined from 14.8 million tonnes in 2007-08 to 14.6 million tonnes in 2008-09 and remained almost unchanged in 2009-10. Vegetable production grew at 26.6 per cent from 101.4 million tonnes in 2004-05 to 128.5 million tonnes in 2007-08. It remained more or less constant at 129.1 million tonnes in 2008-09, with production only 0.5 per cent higher than the previous year. The supply shortages, and falling output of these food items adds to inflationary pressures. The output of these food products, either constant or declining, is unable to meet the demand for these food items. Albeit gradually, the demand for cereals, pulses and vegetables is growing and therefore outpacing supply, which falls much short of the demand in the country. This mismatch in supply and demand in the recent past has led to an upward spiralling of prices for the abovementioned food items.

On the other hand, fruits, milk, eggs, meat and fish displayed increasing output from 2004-05 onwards. Production of fruits increased from 49.8 million tonnes in 2004-05 to 68.5 million tonnes in 2008-09. Milk production increased from 92.5 million tonnes in 2004-05 to 108.5 million tonnes in 2008-09. The output of eggs increased from 45.2 billion in 2004-05 to 59.8 billion in 2009-10, meat production rose from 2.3 million tonnes in 2006-07 to 3.8 million tonnes in 2008-09 and the production of fish increased from 6.3 million tonnes in 2004-05 to 7.6 million tonnes in 2008-09. The prices of these items are increasing, nonetheless, due to the changing consumption patterns in India as was explained earlier in the paper. Higher incomes in the country are increasing demand for these products, for which the supply is increasing but at a rate slower than the demand. More and more people are consuming these products, both in rural and urban India, and the supply is unable to meet the demand, thereby intensifying the rising prices for these food items.

A discussion of supply-side factors would be incomplete without analysing the export situation. Agricultural exports along with agricultural production are the two main factors affecting the supply of food items (others include hoarding, monsoons etc.). An increase in agricultural exports at a rate higher than an increase in production would indicate a diversion of food from domestic consumption to exports, thereby increasing domestic prices. Table 5 shows details of agricultural exports from 2004-05 to 2009-10.

[3] Directorate of Economics and Statistics, Department of Agriculture and Cooperation, Ministry of Agriculture, Government of India, http://dacnet.nic.in/eands/latest_2006.htm. Accessed on 31 March 2011.

Table 5: Break-Up of Exports (in Crore ₹), 2004-05 to 2009-10

Commodity	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10
Pulses	602.6	1115.2	773.3	526.4	540.2	407.4
Rice Basmati	2823.9	3043.1	2792.8	4344.6	9477	10838.9
Rice(Other than Basmati)	3945	3178.2	4243.1	7410	1687.4	414.8
Wheat	1459.8	557.5	35.4	0.2	1.5	0.00
Other Cereals	793.8	453.8	599.3	3002.3	3920.6	3004.9
Total Cereals	9022.6	7232.6	7670.5	14757.2	15086.4	14258.6
Poultry and Dairy Products	458.8	794.6	497.1	960.2	1130.1	549.3
Poultry Products	282	313.4	313.8	429.5	413.5	365.9
Dairy Products	176.8	481.2	183.3	530.7	716.6	183.4
Fruits/Vegetable Seeds	66	93	121.6	142	120	145.3
Fresh Fruits	862.3	1120.7	1414	1446.6	1945.2	2269
Fresh Vegetables	863	919.8	1546.5	1477.9	2454.2	2904.4
Processed Vegetables	362.5	494.5	650.2	602.2	711.2	752.2
Processed Fruit Juices	369.2	599.9	711.4	773.4	1099.2	1156
Miscellaneous Processed Items	908	989.5	1125.1	1362.4	2077.4	2136.9
Meat and Preparations	1905.3	2750.2	3314	3749.5	5371.4	6285.4
Marine Products	6469.2	7035.9	8001	6926.7	7066.4	9891.1
Total Agricultural Exports	41602.7	49217	62411.4	79039.7	85951.7	89522.6
Total National Exports	375339.5	456417.9	571779.3	655863.5	840755.1	845125.2
Per Cent Share of Agricultural Exports in National Exports	11.1	10.8	10.9	12.1	10.2	10.6

Source: Directorate of Economics and Statistics, Department of Agriculture and Cooperation, Ministry of Agriculture, Government of India, http://dacnet.nic.in/eands/latest_2006.htm. Accessed on 31 March 2011.

Table 5 shows agricultural exports fluctuating over the years. Exports of pulses reduced in the last year and a similar decline was seen for total cereals. Poultry and dairy product exports fell by half in 2009-10, mainly because of the sharp fall in dairy product exports. Fresh fruit and vegetable exports experienced a gradual growth with a similar growth in meat and preparation exports, as well as, marine product exports. Overall, there was a small increment in agricultural exports in 2009-10, with the percentage share of agricultural exports in national exports going up by a marginal 0.4 per cent. Thus, exports of cereals and pulses reduced, due to a fall in their production, while fruit, vegetable, poultry and dairy products, meat and marine product exports continue to rise. Therefore, agricultural exports do not increase disproportionally and hardly contribute to the inflationary pressures yet, as exports are regulated based on domestic demand. High-end food items like dairy products, meat and marine products are likely to see higher domestic demand with increases in income and, although currently there is not much evidence of diversion of food from domestic demand to exports, this trend must be maintained in order to avoid worsening inflation.

A point to consider would be the inflation in India measured by the WPI, gives food articles only 15.4 per cent weight in the index while manufacturing products get 63.7 per cent. Most households in India still spend a majority of their income on food and to give it only a 15.4 per cent weight seems to underestimate the impact it has on the daily lives of consumers. Unlike most other countries, India does not use the CPI to measure inflation as the CPI reflect the cost of living conditions for only a homogenous group of consumers, based on retail prices.[4] The WPI is an outdated measure of inflation with unchanged weightings to different products that are now affecting consumers very differently. For example, services, such as education and real estate are not included in the WPI. Increasingly, the share of consumption expenditure spent on services is rising in both urban and rural India. Thus, an important future study on inflation might include creating an appropriate measure of inflation in India to replace the current but outdated WPI.

To conclude, inflation seen in India is a consequence of certain structural inefficiencies playing out simultaneously. The Reserve Bank of India's latest measure of increasing interest rates cannot contain inflation, since high liquidity is not the main cause of the inflationary pressures in the economy. Eventually, a long term policy must be put in place to curb inflation and ensure that the structural problems are dealt with for good. Each of the factors behind the rising prices must be examined in detail. The demand for food in India is not satiated by the current supply, thereby leading to the upward spiral in food prices. A thorough study of the demand patterns must be undertaken to avoid prices for certain commodities rising more than average. The supply of food items must also improve to keep up with the demand. Not only is supply unable to meet demand, it is in some cases constant or even declining, further exaggerating inflationary pressures.

While demand-side factors should be taken into consideration when constructing a policy to curb inflation, detailed research must be undertaken to overcome the supply-side constraints on food production. According to the Ministry of Agriculture, the sector witnessed a growth rate of 3.8 per cent for the first half of 2010-11.[5] Annual growth in food-grain production for the period between 1950-51 and 2006-07 was 2.5 per cent, which exceeded the 2.1 per cent population growth for the same period. However, for the sub-period of 1976-77 to 2006-07, when growth in food-grain production fell to 1.2 per cent and population grew at 1.9 per cent.[6] The agricultural sector in India has, for a long time, been suffering from relatively low

[4] Deepak Mohanty, 'Measures of Inflation in India: Issues and Perspectives', presented at the Conference of Indian Association for Research in National Income and Wealth (IARNIW) at the Centre for Development Studies (CDS), Thiruvananthapuram (9 January 2010), www.bis.org/review/r100125f.pdf. Accessed on 4 April 2011.

[5] Department of Agriculture and Cooperation, 'Annual Report 2010-11', *Ministry of Agriculture, Government of India* (March 2011), p.3., http://agricoop.nic.in/Annual%20report2010-11/AR.pdf. Accessed on 5 May 2011.

[6] Johannes Jansen, Dipak Dasgupta and Abhijit Sen Gupta, 'Food Price Increases in South Asia', *The World Bank* (March 2011), www.worldbank.org.in/WBSITE/EXTERNAL/COUNTRIES/SOUTHASIAEXT/INDIAEXTN/0,,contentMDK:22812432~menuPK:50003484~pagePK:2865066~piPK:2865079~theSitePK:295584,00.html. Accessed on 5 May 2011.

productivity. A shift from the current policy of agricultural subsidies to direct cash transfers is needed on the grounds of efficiency – the subsidies imply large costs both implicit and explicit to the Government – and equity, since it is mainly the richer farmers that benefit most from the former. Investments in rural infrastructure, especially irrigation, electricity and roads are crucial. Equally important is access to financing and improved technology. A majorly overlooked but critical aspect in reviving and sustaining agriculture productivity in India is public spending on agricultural research. Basic farming research can help improve productivity by sparking a new agricultural revolution with better technology, higher crop yields and cheaper fertilisers.

It is also necessary to consider the organisation of agricultural producers into more consolidated and cohesive bodies, to increase their negotiating capacities in critical aspects like marketing and selling of produce.[7] Supply-side shortages get exacerbated due to distribution bottlenecks. Hoarding is rampant in the country, as are leakages from the public distribution system. An estimated 40 per cent of perishable foods, like fruits and vegetables, are also wasted due to lack of quality storage, cold chain and transport infrastructure.[8] Much of these inadequacies can be addressed by expansion of organised retail businesses, which requires more liberal foreign investment policies in domestic retail trade. However, that is an outcome which depends more on political courage than economic foresight.

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[7] Adolfo Brizzi, 'Food Price Crisis', *The World Bank* (April 2008), www.worldbank.org.in/WBSITE /EXTERNAL/COUNTRIES/SOUTHASIAEXT/INDIAEXTN/0,,contentMDK:21743688~menuPK:295605~ pagePK:141137~piPK:141127~theSitePK:295584,00.html#3analysis . Accessed on 5 May 2011.

[8] *Prokerala News* (28 Feb 2011), www.prokerala.com/news/articles/a205268.html. Accessed on 5 May 2011.