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Salient Features of Measuring, Interpreting and Addressing Indian Inflation

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Abbreviations

AMFI	Association of Mutual Funds of India
APMC	Agricultural Produce Market Committee
AUM	Asset under Management
C-CPI-U	Chained CPI for all Urban Consumers
CPI	Consumer Price Index
CPI (IL)	CPI for Industrial Labourers
CPI (RL)	CPI for Rural Labourers
CPI(AL)	CPI for Agricultural Labourers
CPI-U	CPI for all Urban Consumers
CPI-W	CPI for urban wage earners and clerical workers
CSO	Central Statistics Office
DEA	Department of Economic Affairs
DFS	Department of Financial Services
DIPP	Department of Industrial Policy and Promotion
ECB	European Central Bank
EPF	Employee Provident Fund
EU	European Union
FATF	Financial Action Task Force
FCI	Food Corporation of India
Fis	Financial Institutions
FMC	Forward Markets Commission
FOMC	Federal Open Market Committee
FSB	Financial Stability Board
FSDC	Financial Stability and Development Council
FSLRC	Financial Sector Legislative Reforms Commission
FSO	Federal Statistical Office
FX	Foreign Exchange
GNP	Gross National Product
GPF	General Provident Fund
GVO	Gross Value of Output
HCIP	Harmonised Index of Consumer Prices

IMF	International Monetary Fund
IRDA	Insurance Regulatory and Development Authority
MoSPI	Ministry of Statistics and Programme Implementation
MPCE	Monthly Per Capita Expenditure
MSP	Minimum Support Price
MSS	Market Stabilisation Scheme
NSSO	National Sample Survey Organisation
OMOs	Open Market Operations
PBC	People's Bank of China
PCE	Personal Consumption Expenditures
PFIs	Public Financial Institutions
PFRDA	Pension Fund Regulatory and Development Authority
PPF	Public Provident Fund
PPI	Producer Price Indices
PSUs	Public Sector Undertakings
RBI	Reserve Bank of India
RPI	Retail Price Index
SEBI	Securities and Exchange Board of India
UMPs	Unprecedented Monetary Policies
WPI	Wholesale Price Index

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Abstract

The paper reviews the calculation of Indian wholesale and consumer price indices and suggests improvements in the light of past experience and international best practices. It confirms that food inflation has been the driver of domestic inflation.

The paper studies the recommendations of the Urjit Patel Committee and comments that monetary policies predominantly focussed on inflation targeting may not necessarily be effective in India where inflation and inflationary expectations, compared to developed countries, are not that driven by excess demand. A number of shortcomings in storage, distribution and supply bottlenecks are also relevant. The paper also suggests that the efficiency of price discovery mechanisms including those that are relevant for the financial sector need to be improved to enhance the effectiveness of an explicit inflation targeting regime. In this context, the paper lists the approach taken by a few prominent central bankers to inflation targeting post the widespread financial-economic meltdown of 2008.

Indian inflation has been sticky and based on past experience the paper recommends a multiple-target approach and closer coordination between fiscal and monetary authorities.

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Salient Features of Measuring, Interpreting and Addressing Indian Inflation

Kirti Gupta and Fahad Siddiqui[1]

Section 1

1.1 Introduction[2]

After the financial sector meltdown of 2008 and world-wide negative macroeconomic consequences, there has been renewed focus on macroprudential policies. It is agreed in several quarters that economic and financial stability are important objectives which need to factored into central bank and government thinking rather than an excessive focus on inflation using interest rates as the principal instrument of choice. Academics, multilateral institutions such as the IMF and FSB, central bankers and governments are reviewing the need and implications of macro and micro prudential policies with a view to revise the traditional roles of central banks and governments. Concurrently, there is a sense of uncertainty about the national and international consequences of this prolonged period since 2009 that large developed economies such as the US have maintained very low to negative real interest rates using Unprecedented Monetary Policies (UMPs).[3]

The central banks of the US and UK have engaged in Quantitative Easing which is another way of saying that they printed money by buying large volumes of government and mortgage backed securities. The European Central Bank (ECB) announced recently that deposits with ECB could carry negative nominal interest rates of up to minus 0.1%. It remains to be seen if the central banks of G7 countries can ensure that the asset bubbles which may have been created by such massively expansionary monetary policies would not be pricked abruptly and unexpectedly.

In contrast to developed countries, India escaped with relatively little damage to its banks since its capital account is relatively closed and its financial sector is predominantly majority government owned. Turning to Indian inflation, which is the principal focus of this paper, in the last six decades India's average annual inflation rate (measured by changes in the wholesale price index - WPI) was about 6.7% per annum. This rate of inflation was not particularly high compared to rates experienced by developing and emerging economies. However, since 2010 Indian inflation has hovered near or beyond double digits mainly on account of high food inflation. Indian inflation is currently the highest among most emerging economies, matched only by Vietnam which is a smaller and more open economy. As is well recognised, high inflation erodes confidence in future purchasing power thus impacting savings, investment and economic growth. Reduced domestic and foreign investor confidence

[1] Kirti Gupta and Fahad Siddiqui are Researchers at ICRIER.

[2] This paper has been written as part of Research Studies conducted under 'ICRIER-RBI Chair' headed by Dr. Jaimini Bhagwati. We are thankful to Dr Shankar Acharya and Dr. Rakesh Mohan for their valuable comments.

[3] Bayoumi, T. etal, 'Monetary Policy in the New Normal', IMF Staff Discussion Note

results in lower investments and inflows into the country. High inflation also raises business risks and lowers export competitiveness. Given the high costs of sustained inflation, it is one of the serious challenges facing the country today.

Table 1: Indian inflation has been higher than the world average in recent years

(Year-on-year in per cent)							
	2000-07 Average	2008 Annual	2009	2010	2011	2012	2008-12 Average
Global Inflation							
World	3.9	6.0	2.4	3.7	4.9	4.0	4.2
EDEs	6.7	9.3	5.1	6.1	7.2	6.1	6.8
WPI in India							
WPI	5.2	8.1	3.8	9.6	8.9	7.6	7.6
WPI –Food	3.8	8.9	14.6	11.1	7.2	9.1	10.2
WPI – NFMP	4.3	5.7	0.2	6.1	7.3	5.2	4.9
CPI – IW	4.6	9.1	12.2	10.5	8.4	9.9	10.0
Indian inflation data pertains to financial year, EDEs: Emerging and Developing Economies, WPI: Wholesale Price Index, NFMP: Non-food manufactured products, CPI-IW: Consumer Price Index for Industrial Workers.							

Source: RBI

Inflation is measured using several price indices in India. Changes in the prices of goods at the wholesale price level are gauged by the Wholesale Price Index (WPI) whereas changes in prices of goods and services at the retail level are measured by the Consumer Price Index (CPI). Another methodology to measure changes in prices, apart from estimating price indices, is to use the Gross National Product (GNP) deflator which is the ratio of GNP at current prices to GNP at constant prices. However, GNP numbers are not used to measure inflation in India because of the limited frequency with which these are estimated, just once every quarter. This paper's focus is primarily on the effectiveness or otherwise of monetary policies in containing Indian inflation since shocks to food prices can be a common factor in driving inflation in Emerging Market Economies[4].

After this introductory Section I, Section II details the constituent components of Indian WPI and CPI indices and their weights and reviews which domestic agencies are responsible for collation of raw price data and compilation of these indices. Section III covers inflation measurement practices followed in the US and a few other OECD countries and major emerging economies. Section IV reviews RBI's recently published study on Indian inflation titled "Report of the Expert Committee to Revise and Strengthen the Monetary Policy Framework, January 2014". The final Section V carries this paper's conclusions.

[4] Mohanty, M. S. and Klau, M., 'What determines inflation in emerging market economies?', BIS Paper No. 8, pp. 2

Section 2

Architecture of Indian Inflation Indices

2.1 WPI

India's WPI was based on select items which were considered important region-wise on the basis of the traded values of commodity baskets[5]. For instance, the manufacturing product basket includes all such products with traded value of Rs 120 crore or more. This was the procedure followed for the 1993-94 (base year) series. However, this practice was later changed and 2004-05 was taken as the base year which included each product group in the manufacturing basket, which together cover at least 80 per cent of the traded value at the group level[6]. The price movements of each commodity are tracked individually. For instance, the latest WPI with base year 2004-05 includes 676 commodities and 5482 price quotations which are taken into account while calculating the index. However, price quotations are obtained on a voluntary basis and surveys have not been done on a periodically consistent basis.

The constituents of the WPI are now categorised into three groups (a) Primary Articles which mostly consist of Food items; (b) Fuel & Power; and (c) Manufactured Products. The highest weight is assigned to Manufactured Products and this category constitutes approximately 50% with the Primary items category with Food amounting to about 30%. As shown in Table 2, weights are assigned on the basis of wholesale transactions and these weights have changed over time.

WPI data collection is not done on a defined periodicity basis and there are no pan-India collection centres. Price quotations for manufactured items are collected through online surveys conducted by the Ministry of Commerce and Industry whereby designated factories submit their data online. Price quotations for food items are collated by the Ministry of Agriculture and fossil fuel prices are put together by Ministry of Petroleum and Natural Gas and by PSUs. It is understood that the manner in which the Ministries collect their data is deemed confidential. These Ministries and Government bodies pass on their data to the Office of the Economic Adviser, Department of Industrial Policy and Promotion (DIPP) in the Ministry of Commerce and Industry where the data is collated and the national Wholesale Price Index is released on a monthly basis[7].

Specifically, the WPI is calculated as follows: First, the price index for each commodity is calculated individually for which price relatives (current price/base price)*100 for all price

[5] Traded value = Domestic production plus Imports net of direct imports reaching factories minus Direct exports.

[6] Kumar and Boopathy (2012), CSO

[7] Ministry of Commerce and Industry used to release weekly WPI data on groupings of Primary items such as Food and Fuel & Power. The Government discontinued this practice from February 2012 and since then data has been released on a monthly basis.

quotations of a commodity are calculated. Thereafter, the simple arithmetic mean is calculated for all the price relatives. In this way a single commodity index is obtained. The same procedure is repeated for all 676 commodities and 676 price indices are calculated. To absorb individual commodity indices into one all-commodity index (or WPI), weights are assigned to each commodity on the basis of Gross Value of Output (GVO) and thereafter, a weighted arithmetic mean is calculated[8]. In this way, one index value which covers all commodities is calculated.

Table 2: Comparative Weights assigned to WPI Product Groups

Major Group/Group	**1970-71**	**1981-82**	**1993-94**	**2004-05**
All Commodities	**100**	**100**	**100**	**100**
Primary Articles	**41.667**	**32.295**	**22.025**	**20.118**
Food Articles	29.799	17.386	15.402	14.337
Non Food Articles	10.621	10.081	6.138	4.258
Minerals	1.247	4.823	0.485	1.521
Fuel and Power	**8.459**	**10.663**	**14.226**	**14.91**
Coal		1.256	1.753	2.094
Mineral Oils		6.666	6.987	9.364
Electricity		2.741	5.484	3.452
Manufactured Products	**49.874**	**57.042**	**63.749**	**64.972**
Food Products	13.322	10.143	11.538	9.974
Beverages, Tobacco	2.708	2.149	1.339	1.762
Textiles	11.026	11.545	9.8	7.326
Wood and Wood Products	0.174	1.198	0.173	0.587
Paper and Paper Products	0.851	1.988	2.044	2.034
Leather and Leather Products	0.385	1.018	1.019	0.835
Rubber and Plastic Products	1.207	1.592	2.388	2.987
Chemicals and Chemical Products	5.548	7.355	11.931	12.018
Non-Metallic Mineral Products	1.415	2.477	2.516	2.556
Basic Metals, Alloys and Metal Products	5.974	7.632	8.342	10.748
Machinery and Machine Tools	5.045	6.268	8.363	8.931
Transport Equipments and Parts	1.673	2.705	4.295	5.213
Other Industries	0.546	0.972	0	0

Source: Office of the Economic Advisor, Ministry of Commerce

It is worth noting that a basket of commodities which is determined in the base year is used for all following years, be it WPI or CPI. For instance, the composition of commodities determined in base year 2004-05 remains the same for all following years unless there is a change in the base year. In short, changes in prices over the years are estimated while keeping the basket of commodities constant. However, this methodology does not take into account

[8] WPI manual ; Ministry of Commerce

changes in consumption patterns over time. Therefore, timely revision of base years would be a better practice to follow.

2.2 CPI

Currently, four CPIs are estimated in India, corresponding to different segments of the population. Namely: (a) CPI for Industrial Labourers (IL); (b) CPI for Agricultural Labourers (AL); (c) CPI for Rural Labourers (RL); and (d) CPI for all-India (or combined CPI) which was released recently and encompasses all groupings of the population[9]. Further, all-India CPI is sub-divided into urban CPI which corresponds to prices for populations resident in urban areas and rural CPI which takes into account the rural populations in India[10].

India did not have one composite consumer price index before the advent of all-India CPI. Four different price indices corresponding to specific sections of the population were estimated. That is CPI (IL), CPI (AL), CPI (RL) and CPI (UNME). The dissemination of four different indices was a source of some confusion to both observers and analysts. Khatkhate (2006), Karan (2012) constructed a composite CPI by using different weight criteria[11]. Now this cause for differences in opinion has been eliminated as Government has decided on a CPI for the country as a whole. However, the difficulty now lies in accessibility of distant past data since this is only available January 2011 onwards with 2010 as a base-year. Consequently, for time-series analysis in the next Section, CPI (IL) rather than CPI (AL) or CPI (RL) is considered. CPI (IL) has wider geographical coverage as it covers all Indian states while the latter two cover 20 states. Further, the CPI (IL) series has the latest base year 2001 while the others have dated base years 1986-87. Moreover, CPI-IL is used as a cost of living index in the organised sector. And, CPI (IL) by default represents CPI when it is estimated. It had been a broad based inflation indicator for the country as a whole particularly before the introduction of all-India CPI, including both services and manufacturing products although the weightage for food items dominates the group as can be seen in Table 3. It has been observed that CPI-IL and all-India CPI show similar inflation trends.[12]

[9] The CPI for Urban Non-Manual Employee (UNME) has been discontinued from April, 2010, so effectively there are four CPIs. http://mospi.nic.in/stat_act_t4.htm

[10] Urban CPI includes all cities/towns with population more than 9 lakh as per the 2001 Population Census, covering 310 towns in total whereas rural CPI is based on representative samples of two villages from each district, covering 1181 villages across India.

[11] Karan (2012) assigned equal weights to all four CPI indices, namely CPI (IL), CPI (AL), CPI (RL) and CPI (UNME) to obtain a single measure of CPI inflation.

[12] RBI (2014), Report of the Expert Committee to Revise and Strengthen the Monetary Policy Framework

Table 3: Weights assigned to CPI-IL Product Groups, Base 2001

Particulars	**Weight**
Food	57
Pan, Supari, Tobacco & Intoxicants	3.15
Fuel and light	6.28
Housing	8.67
Clothing, bedding and footwear	8.54
Miscellaneous*	16.36
Total	**100**

*Includes (a) Medical care, Education (b) Recreation and Amusement (c) Transport and Communication (d) Personal Care and Effects (e) Others

Source: Ministry of Labour and Employment

The price data collection for CPI (IL) is done by 78 centres spread across India as per the coverage of industries. Each centre calculates its own monthly sub-groups, groups and general (all groups combined) indices. By taking the weighted arithmetic average of centres' indices, an all-India index is obtained. The index in each centre is calculated in several stages by sub-groups and general groups. First, the relative prices of each item included in a sub-group, say, food is calculated. If an item has multiple price quotations, the price-relative is first calculated separately and then a simple average of these price relatives is taken as the price-relative for that item. In this manner, the relative price for each commodity is obtained. Next, the sub-group and group weights are assigned to each commodity on the basis of Family Living Surveys which are conducted periodically by the National Sample Survey Organisation (NSSO) and weighted arithmetic means are calculated which are consolidated to arrive at the general CPI. This procedure is repeated across centres and thus an all-India CPI is obtained.

At the core of estimating dependable price indices is how reliable are the prices collected by centres since the probability of errors in basic data is high. The number of items in the consumption baskets of different centres varies from centre to centre depending on the consumption pattern related to specific centres. The price data for each centre is collected by employees of State Governments called Price Supervisors and Price Collectors who usually belong to the Directorate/ Bureau of Economics and Statistics of Labour Departments. Each centre usually targets more than one market and several shops in each of them. Thereafter, the same shops are visited at regular intervals by Price Collectors under the guidance of Price Supervisors. Accordingly, retail prices for various commodities, including food items are collected by each centre. The retail price data collected by several centres across India are scrutinised by Labour Bureau officers who are posted in Regional Offices located in Kanpur, Ahmedabad, Madras and Kolkata. Finally, price data is reviewed by officers working at the Headquarters of the Directorate/Bureau of Economics and Statistics of Labour Department in Chandigarh and CPI (IL) is released on a monthly basis.

CPI for Agricultural Labourers (AL) and Rural Labourers (RL) as these terms suggest pertain to agricultural labour and rural labour households respectively. A rural labour household is defined as one whose income during the last 365 days was more from wages paid for manual employment (agricultural labour) vis-à-vis wages paid for non-manual employment and also self-employment. From among rural labour households, those households, which earn 50% or more of their total income during the last 365 days from wages paid for manual labour engaged in agriculture related activities, are categorized as agricultural labour households. It follows that agricultural labour households are a subset of rural labour households.

These indices are mainly used for the determination of minimum wages in the agricultural sector. The broad items of consumption expenditure of CPI (AL) and CPI (RL) are divided into 5 groups, namely, (i) Food (ii) Pan, Supari, Tobacco and Intoxicants (iii) Fuel and Light (iv) Clothing, Bedding and Footwear and (v) Miscellaneous.

Table 4: Weights assigned to CPI (AL) and CPI (RL) Product Groups, Base 1986-87

Group	**CPI (AL)**	**CPI (RL)**
Food	69.15	66.77
Pan, Supari, Tobacco and Intoxicants	3.79	3.7
Fuel & Light	8.35	7.9
Clothing, Bedding & Footwear	6.98	9.76
Miscellaneous	11.73	11.87
All Groups	**100**	**100**

Source: Labour Bureau; http://labourbureau.nic.in/Annual_Rep_ALRL_2010_11.pdf

The retail prices for both series are currently collected on a monthly basis, for 20 states (although there are 29 states at present) and all-India, separately for CPI (AL) and CPI (RL). The data is collected from 1461 markets spread across 600 sample villages by the field officers of the National Sample Survey Organisation (NSSO). The price index for each commodity is calculated in a similar way as it is for CPI IW. However, price quotations collected from different markets for both of these indices are the same but the weights at the compilation stage are different for agricultural labour and rural labour households. And, the weights used in compilation of CPI (AL) and CPI (RL) have been estimated through sample data of the NSSO's 38th round survey, conducted after five years, during 1983. However, it is worth noting that both these indices use an outdated base year i.e. 1986-87 to estimate price indices. To that extent, these indices do not reflect changes in prices of commodities and services accurately.

CPI (AL) and (RL) are combined separately for each of the 20 states by the Labour Bureau, Ministry of Labour and Employment, once the price indices of all commodities are sent by NSSO Field Officers. An all- India series is also compiled and released by the Labour bureau by taking the weighted average for 20 states.

The combined CPI which integrates different sections of the population is a better consumer price measure as compared to aforementioned CPIs, since it is one unified and pan-India CPI with the latest base year of 2010. Combined CPI provides statistics for urban, rural and combined populations. The index is also available for all States[13]/ UTs separately for rural, urban and combined every month with effect from January 2011. Similar to CPI (AL) and RL, weights or consumption pattern are derived on the basis of average monthly consumer expenditure of urban/rural households obtained from the results of the Consumer Expenditure Survey conducted by the NSSO during 2004-05. In comparison to other CPIs, it has a broader consumption basket, comprising about 175 items in rural and around 200 items in urban areas.

Further, the combined CPI has 5 broad groups (Table 5) as do other CPIs. However, combined CPI includes more items within each grouping. For instance, new services are included in the index such as railway and air fares, telephone charges, barber/beautician charges, washer-man charges, tailoring charges etc.

Table 5: Weights assigned to Combined CPI Product Groups, Base 2010

Group	Rural	Urban	Combined (Rural + Urban)
Food, beverages and tobacco	59.31	37.15	49.71
Fuel and Light	10.42	8.4	9.49
Clothing, Bedding and footwear	5.36	3.91	4.73
Housing		22.53	9.77
Miscellaneous	24.91	28	26.31
All Groups	100	100	100

Source: CSO Manual 2011, http://mospi.nic.in/mospi_new/upload/brochure_n_cpi18_feb11.pdf

Turning to price collection in rural areas, there are 1181 villages in total which are used for collection of price quotations of different items. Two villages were selected from each district. But those states which have higher population but less districts, additional villages have also been selected. However, the number of items for price data collection identified through the market survey varies not only among states/UTs but also among the villages within the state/UT. The price quotations are collected from selected shops in villages every month by the Department of Posts. This is because the field investigators of NSSO are not readily available for price collection. However, postal officials are trained by NSSO and CSO at selected centres in the country for price data collection in rural areas.

[13] However, it is to be noted that the index is not available for newly formed state- Telangana.

For price data collection in urban areas, all cities/towns with population above 9 lakh were selected on the basis of the 2001 Population Census. And, the total number of selected towns across the country is 310. The number of markets allocated to these cities/towns is as follows:

Table 6: Markets allocated as per population

Towns with population	No. of markets allotted
9-25 lakh	8
25 lakh-1 crore	12
1 crore>	24
Remaining State/ UT capitals	4

Source: CSO Manual 2011; http://mospi.nic.in/mospi_new/upload/brochure_n_cpi18_feb11.pdf

The total number of markets which are followed at present is 1114 and these markets represent different geographical areas towns and also popularity among different segments of the population (poor, middle and affluent) living towns. Each selected market is visited every month for price data collection by NSSO field investigators. After that the final data is uploaded to the web portals of the National Informatics Centre from the various data collection agency centres. Thereafter, it is compiled and released nation-wide by the Central Statistics Office (CSO), Ministry of Statistics and Programme Implementation (MoSPI).

A snapshot of designs of all prevalent price indices in India is as below.

Table 7: Price Indices compiled at National Level

Sl. No.	Feature	CPI (IW)	CPI (AL)	CPI(RL)	Combined CPI (Rural+Urban)	WPI
1	Data Compiled and Released by	Labour Bureau, Ministry of Labour	Labour Bureau, Ministry of Labour	Labour Bureau, Ministry of Labour	CSO, MoSPI	OEA, Ministry of Commerce
2	Source of Weights	Family Living Survey, NSSO, 1999-2000	Consumer Expenditure Survey, NSS 38th Round (1983)	Consumer Expenditure Survey, NSS 38th Round (1983)	Consumer Expenditure Survey, NSS 61st round (2004-05)	As per Gross Value of Output
3	Base year of the series	2001	1986-87	1986-87	2011	2004-05
4	No. of centres/villages	78 centres	600 villages	600 villages	Rural Villages - 1181 Urban Centres - 1114	NA*
5	No. of markets	289	1461	1461	as above	5482
6	No. of items in the consumption basket	175-200	260	260	Rural CPI-175 Urban CPI-200	676
7	Price quotations collected by	Field Officers of Directorate/ Bureau of Economics and Statistics of Labour Departments	Field Officers of NSSO	Field Officers of NSSO	Officers of Department of Posts	Online Surveys and through various ministries
8	Index released for	78 centres and all-India	20 States and all-India	20 States and all-India	All States/UTs and all India	Single all-India
9	Periodicity of index	Monthly	Monthly	Monthly	Monthly	Monthly

Note: *NA = Not Applicable; Source: Authors' compilation

To summarise, CPI (IL) is compiled and released on a monthly basis by the Labour Bureau, Ministry of Labour as are CPI (AL) and CPI (RL). In contrast, combined CPI is collated and released by the Central Statistical Organisation (CSO) in the Ministry of Statistics and Programme Implementation. As regards WPI, it has been continuously compiled and released by the Office of Economic Adviser in the Department of Industrial Policy and Promotion, Ministry of Commerce and Industry since 1942, post the outbreak of the Second World War. As such, different government departments and subordinate bodies are responsible for the estimation and release of price indices in India which is not the case in most developed countries. The estimation of price indices in select developed countries is reviewed in the next Section.

Section 3

Measurement of inflation in larger economies

In the **US**, several price indices are estimated. These include the following: Consumer Price Index (CPI); Personal Consumption Expenditures deflator (PCE); Producer Price Indices (PPI); and GDP deflator. The first two indices account for prices paid by consumers while the PPI, which used to be called the Wholesale Price Index is an estimate of average changes in producer prices i.e. the price producers receive in exchange for their output. Apart from these indices, which measure overall inflation, core inflation (excluding volatile price commodities such as food and fuel) is also officially calculated, unlike India. The following table has been compiled using data from various sources to provide a snapshot of the price indices used in the US.

Table 8: Composition of Indices used to measure inflation in USA

Price Indices	***Coverage***	***Proportion of US Population/ Goods coverage***	***Compiled & Published by***	***Weights assigned as per***	***Frequency***	***Updates/Revision of weights***
CPI						
CPI for all urban consumers (CPI-U) or widely used CPI	Goods & services	87%	Bureau of Labor Statistics (BLS)	Consumer Expenditure Survey	Monthly	Weights are revised every few years
Chained CPI for all urban consumers (C-CPI-U)	"	"	"		"	Weights are revised monthly
CPI for urban wage earners and clerical workers (CPI-W) or subset of CPI-U	"	32%	"	Consumer Expenditure Survey	"	Weights are revised every few years
Producer Price Index (PPI)	"	600 industry price indexes in combination with over 5,000 specific product	"		"	
Personal Consumption Expenditure (PCE) deflator	"	Not Applicable	Bureau of Economic Analysis (BEA)	Not Applicable	"	Not Applicable

As shown in the above table, several price indices such as CPI-U (or CPI), CPI-W, PPI, and PCE are estimated in the US. Of these only two consumer indices CPI and PCE are tracked

by the Federal government and the Federal Reserve Bank[14]. To be precise the former uses CPI to make inflation adjustments in social benefits such as social security while the latter focuses on PCE inflation for its quarterly economic projections and for targeting longer-run inflation goals. However, the Federal Open Market Committee (FOMC) used to focus on headline CPI prior to 2000 but has since switched to PCE inflation. The PCE index is based on actual spending by consumers whereas CPI is based on consumer surveys in which consumers state what they spend. Further, the former has a more comprehensive coverage of goods and services than the latter[15].

In the **UK**, there are two main consumer price indices which are published monthly by the Office for National Statistics (ONS), namely, the Retail Price Index (RPI) and the Consumer Price Index (CPI). The latter is also called the Harmonised Index of Consumer Prices (HCIP) in the European Union (EU). CPI excludes mortgage interest payments and housing costs (housing depreciation, council tax, dwellings insurance, ground rent, estate agents fees, surveyor costs and conveyance fees) and is used to measure headline inflation in the UK. The RPI which includes mortgage payments is a general purpose indicator of inflation and is widely used in indexation of pensions, benefits and index-linked gilts.

There are variants of both these indices. For instance, RPI-X excludes mortgage interest payments and CPI-Y excludes indirect taxes and the traditional measure of UK inflation was the RPI. In 2003, the government decided that the Monetary Policy Committee should use CPI for inflation targeting purposes. CPI is now used as the official measure for explicit inflation targeting and the target has been set at 2% by the Government[16], not by Central Bank of England. The major consumer price indices RPI-X and CPI are discussed in detail in the following table. The Producer Price Index (PPI) is another and also the oldest indicator of inflation in the UK. It has been published for over hundred years and it measures the adjustment of prices in goods bought and sold by manufacturers. It is split into two different categories. Input PPIs, which measure changes in the prices of materials and fuel bought by manufacturers and output PPIs measure changes in prices that manufacturers charge for ordered goods (also known as "factory-gate" prices). PPI is also estimated on a monthly basis by the ONS and is used for deflating current price values in National Accounts.

The RPI was first estimated in the 1950s while the CPI/HCIP was introduced in the 1990s due to the felt need within the EU to introduce a consumer price index based on harmonised definitions so as to measure European inflation. Its methodology and coverage have been agreed upon by EU members in order to ensure consistency and comparability across European countries.

[14] CPI vs. PCE Inflation http://www.stlouisfed.org/publications/re/articles/?id=2390#chart

[15] CPI vs. PCE Inflation http://www.stlouisfed.org/publications/re/articles/?id=2390#chart

[16] The UK Government i.e. the Chancellor of the Exchequer announces the Government's inflation target each year in the annual Budget statement which is then targeted by the Bank of England to achieve price stability. < http://www.bankofengland.co.uk/monetarypolicy/Pages/framework/framework.aspx>

Table 9: Composition of Inflation Indices in the UK

Criteria	RPI-X	CPI/HCIP
Composition: RPIX and CPI differ in terms of composition	Includes owner-occupied housing costs, buildings insurance and Council Tax These costs account for around 9% of the RPIX basket of goods and services.	Does not include owner-occupied housing costs, buildings insurance and Council Tax
Measurement: Some goods and services appear in both baskets but are measured in different ways	Example: Cars Uses only second-hand car prices	Example: Cars Uses both new and second-hand prices
Coverage:	The RPIX'S chosen basket of goods intends to represent an 'average' UK household Excludes expenditure by the highest 4% of earners, and pensioners largely on benefits, and residents of institutions.	The CPI takes into accounting spending by all consumers Includes the expenditure of all private households and residents, as well as foreign visitors to the UK
Methodology: Differences arise from combining disaggregated price information into an aggregate index	Uses an arithmetic averaging procedure for 60% of goods and services that do not have sufficiently disaggregated expenditure information to allow direct inclusion in the aggregate index	Uses geometric averaging

Since CPI takes the geometric mean of prices instead of the arithmetic mean, CPI is generally lower than the RPI. The rationale is that this will account for consumers buying less if prices go up and vice versa. This difference in the averaging method is the largest contributing factor to the differences between the RPI and the CPI as per the Office for National Statistics.

Germany, Europe's largest economy, monitors prices through its Federal Statistical Office (FSO) which conducts surveys to calculate several price indices. Germany estimates a national Consumer Price Index (CPI) and the Harmonised Index of Consumer Prices (HICP) to track consumer price movements on a monthly basis. CPI captures the average price change for all goods and services purchased by households for consumption and it provides an overall sense of price rise in the country covering all households and regions. It is also

used for deflation purposes in national accounts.[17] German HCIP is calculated according to EU wide established criteria and is used by the European Central Bank (ECB) to assess inflation in Germany. It is also used in the calculation of European HICP. The Euro area HICP is published by EU's statistical outfit namely Eurostat and is used as a measure of inflation in EU member countries.

Apart from these consumer price indices, Germany also estimates producer price, wholesale price and foreign trade price indices. These indices are calculated on a monthly basis by the FSO. The index of producer prices for industrial products measures price developments for raw materials and industrial products produced and sold in Germany. This includes mineral oil products, metals, basic chemicals and food and is used as a leading indicator of prices at the upstream stages of production.

The Wholesale Price Index represents prices for goods sold by wholesalers in the domestic economy. Goods sold include petrol, heating oil, metals, ores, grain and seed, etc. The goods may have been produced within Germany territory or imported while in the case of the Producer Price Index imported goods are not considered. In addition, price movements for all goods traded between Germany and foreign countries are tracked by the Import and Export Price Indices.

The Bundesbank was the first central bank to pursue strategies to contain inflation based on monetary targets. The monetary aggregate used was central bank money, a narrow aggregate which is the sum of currency in circulation and bank deposits weighted by the required reserve ratios as of 1974. In 1988, the Bundesbank switched targets from central bank money to M3[18].

On 31 December 1998, due to the formation of the European Monetary Union, the Bundesbank's responsibility for conducting monetary policy came to an end. In the Euro monetary area, a common inflation target is targeted for all member countries. Since 2000, the strategy followed by the ECB is to keep year-on-year inflation in the Euro area HCIP to below 2%. Of course, in recent times the ECB is concerned about deflation in the Euro area and is even contemplating the possibility of negative nominal interest rates.

China's central bank (People's Bank of China or PBC) does not explicitly target inflation. The PBC focuses on the value of the currency and exchange rate stability. China uses multiple instruments including foreign exchange market interventions, reserve requirements and administrative controls on interest rates to target growth of money and credit.[19]

[17] Federal Statistical Office

[18] European Central Bank Working Paper; Duetsche Bundesbank Discussion Paper

[19] Filardo, A. and Genberg, H., ' Targeting inflation in Asia and the Pacific', Bank of International Settlements and Hong Kong Monetary Authority

Indonesia achieves its objectives by an inflation targeting framework. Indonesia's central bank targets price stability and exchange rate stability as its objectives. The CPI ceiling is set by the Government after coordination with the Bank of Indonesia which then serves as the target for the central bank's policies. It is important to note that the inflation in Indonesia is subject to shocks represented by volatile food prices and administered price categories which together account for about 40% of the CPI thereby constraining the ability of Bank Indonesia to achieve its inflation targets. As per the Bank of Indonesia working to contain inflation needs cooperation and coordination between the Government and Bank Indonesia.[20]

OECD countries have several price indices but they have consistently used one price index for their monetary policy framework. Additionally, in these countries[21] one agency has been made responsible for estimation and publication of key price indices used by their central banks and finance ministries unlike in India.

To sum up, the **US** targets core-inflation[22] excluding food and oil because the prices of these commodities do not respond readily to changes in monetary policy. The central bank of **Canada** targets combined CPI but also monitors "core" inflation measures to 'look through'[23] temporary changes in combined CPI to thereby remain focus on underlying longer-term trends. The **South African** central bank targets a band for consumer prices (overall CPI). However, it used to targets consumer prices only for metropolitan and other urban areas until 2000 after which it introduced a flexible inflation-targeting framework.[24] **Bank of Thailand** targets core-inflation[25] while the **EU** and the **UK** target headline inflation[26].

[20] Bank Indonesia

[21] In Japan the responsibility for estimation and publication of price indices has been assigned to two bodies. These are the Statistics Bureau, Ministry of Internal Affairs and Communications and the Bank of Japan.

[22] US does not have a formal target. However, an inflation rate of 2% is seen as desirable.

[23] To use as a means to understand the drivers of inflation thereby identifying temporary spikes compared to longer-term trends

[24] South African Reserve Bank

[25] Bank of Thailand

[26] STCI (2011), 'Which Measure of Inflation: Headline, Core or Trimmed?', Available at <http://www.stcipd.com/UserFiles/File/Which%20Measure%20of%20Inflation%20Headline,%20Core%20or%20Trimmed.pdf>; BIS MC Compendium, Petursson (2004); Handbook of Central Banking, 29, Bank of England

Section 4

Trends in Indian Inflation

4.1 WPI and CPI

In the past four decades, WPI and CPI inflation have risen steadily in India. For instance, CPI inflation in 2012-13 was 10.4% compared to 3.2% in 1971-72[27]. Similarly, WPI inflation rose to 7.4% from 5.6% over the same period. However, the inflation varied through several highs and lows over these time periods.[28] Another change has been the divergence between WPI and CPI inflation from 1994 onwards[29]. This has been particularly evident in times of crisis be it the oil price shocks in the 1970s, 1997 Asian crisis or the 2008 global financial sector meltdown. In the first two periods of stress, WPI and CPI inflation rose sharply but this did not happen post 2008. In this Section, CPI (IW) is used as proxy for measuring CPI inflation. Annual averages for CPI (IW) and WPI are taken into account while calculating year-on-year changes in inflation.

The following time series graph, starting from 1970s, illustrates that WPI and CPI-IW inflation have moved in tandem except during the period of the last global financial crisis (Figure 1). WPI inflation registered a sharp decline while CPI inflation rose sharply during 2009-10. Specifically, CPI increased from 9.1% in 2008-09 to 12.2% in 2009-10 and in contrast WPI fell from 8% to 3.8% during the same period. The sharp surge in consumer prices was due to adverse global and domestic factors with high food and fuel prices dominating overall CPI.[30] WPI inflation fell below 2%, in 8 out of 12 months in 2009 as this was broadly due to a fall in industrial production driven by global recession. Surprisingly, however, wholesale food prices jumped 26% while overall wholesale prices dropped by 89% in 2009. This rise in wholesale food prices was not captured by WPI as the weightage for food articles is just 14.3% compared to 65% for manufactured products in this index (Figure 3)[31]. On the other hand, the weightage for food is 57% in CPI items which captures the impact of food prices better. Further, wholesale prices do not take into account the substantial margins at the retail level, which tend to rise when there are shortages. However, when just the changes in food prices for WPI and CPI are plotted (Figure 2) the two curves are found to be fairly close to each other.

[27] The study starts from 1971-72 because data is readily available only since then.

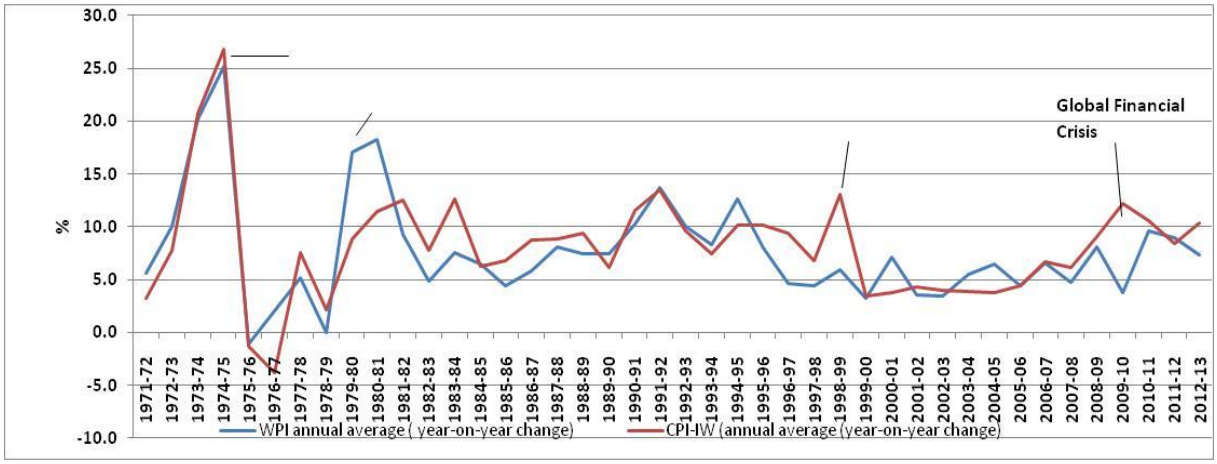
[28] This is illustrated in Figure 1

[29] This can be seen in Figure 1

[30] Headey and Fan (2008), Mahendra Dev (2011), RBI (2013), Gulati and Saini (2013).

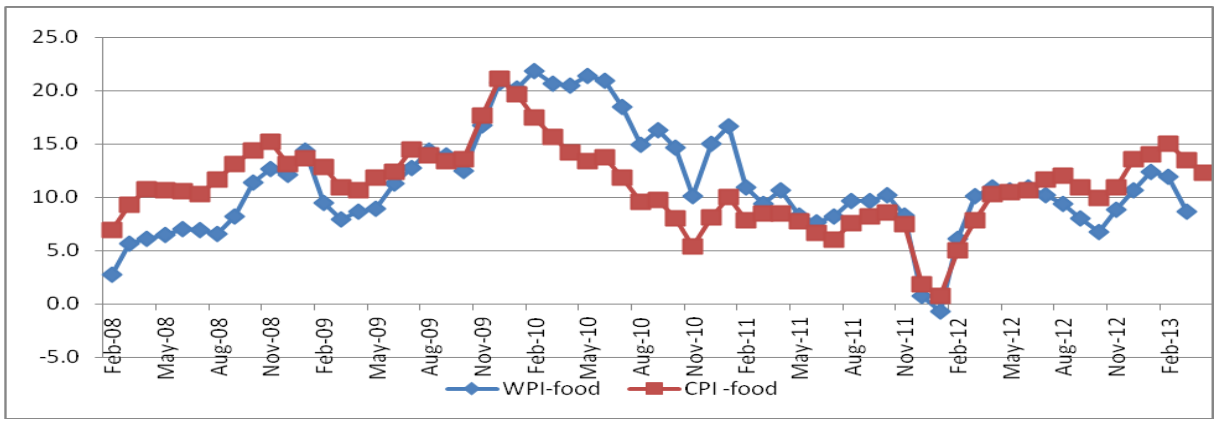
[31] To check whether the rise in overall Indian inflation is principally due to higher food inflation during Global Financial Crisis monthly data (year-on-year change) for WPI food inflation and CPI food inflation has been reviewed in this study.

Figure 1: WPI & CPI-IW Annual Inflation



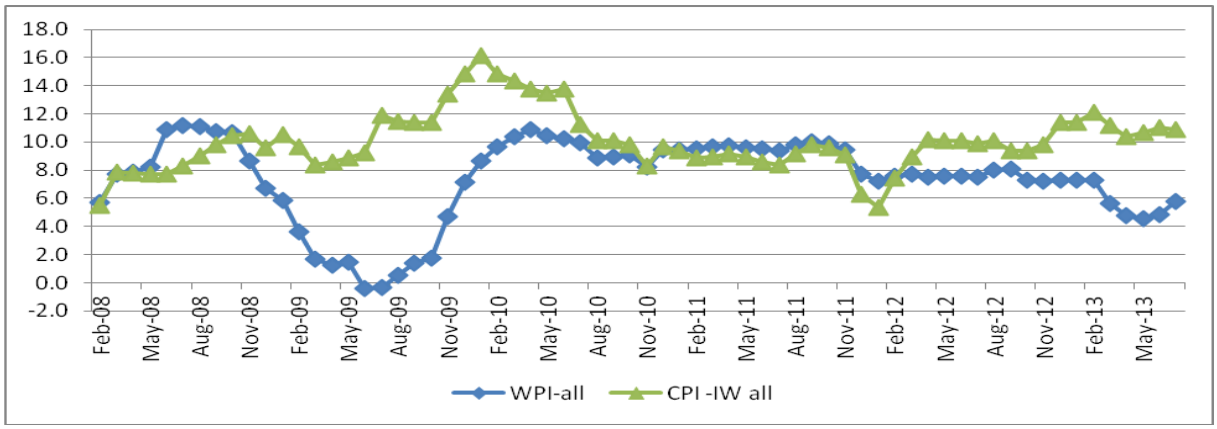
Source: RBI

Figure 2: WPI and CPI-IW Food Inflation



Source: RBI

Figure 3: Monthly WPI and CPI-IW Inflation



Source: RBI

As can be seen from Figure 1 above, WPI inflation came down significantly from 1994-95 and stayed relatively low till 2003-04. Inflation was significantly lower towards the latter half of the 1990s . Even though fiscal deficits persisted in the range of 6 – 8% of GDP (as shown

in Annex B as per annual Economic Surveys, the measures taken to reduce inflation included constraining monetary growth to about 16% in 1996-97 and other supply side measures such as continuation of Food Corporation of India's (FCI's) open market sale of rice and wheat, import of wheat to augment public stocks, import of edible oils, palm oil and pulses and reduction in excise duties among others. It is also explained in the Economic Surveys of 1995-96 and 1996-97 that the rise in inflation in the early 1990s was mainly due to the oil price shocks, higher import bills and the balance of payment crisis which has prompted a foreign exchange reserves build-up phase which fed into a higher growth of money supply.

While various studies point to the positive correlation between sustained fiscal deficits, increase in inflation and negative effects on long-term economic growth[32], the increase in inflation experienced since 2008-09 can be attributed to increasing fiscal deficit numbers and higher growth rate of M3 in India as shown in Annex B and Annex D. The Economic Survey for 2009-10 attributes the rise in inflation to higher international fuel and commodity prices and increasing domestic demand. This year also marked the beginning of an erosion in the growth momentum in India. This negative relationship between inflation and GDP growth rate in India has been corroborated[33].

4.2 WPI inflation after alteration of weights assigned to Product Groups

In this sub-section, higher weightage is assigned to food items in the WPI basket to check if this reduces the gap between WPI and CPI inflation. CPI inflation has been higher than WPI inflation after the outbreak of global financial crisis and high food inflation as compared to overall inflation levels is the principal causual factor. As mentioned in Section II, WPI weights for primary articles in which food items have a dominant share have been reduced over time. Currently, it stands at 20% while it was double that number in the 1970-71 base year (Table10)[34].

The weights as per 1970-71 base year are applied to the WPI time series, starting from 1983-84, when primary articles accounted for around 40% of all commodities taken together[35]. In other words, higher weights are assigned to primary articles (food) as compared to currently prevalent weights to make these weights comparable to those in CPI which gives higher weightage to food.

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[32] Rubin, R., Orszag, P. and Sinai, A. (2004), 'Sustained Budget Deficits: Longer-Run US Economic Performance and the Risk of Financial and Fiscal Disarray'

[33] Salian, P. and K., Gopakumar, 'Inflation and Economic Growth in India – An Empirical Analysis', IGIDR

[34] The proportion of food items in primary articles has reduced from 75% in 1970-71 to 70% in 2004-05.

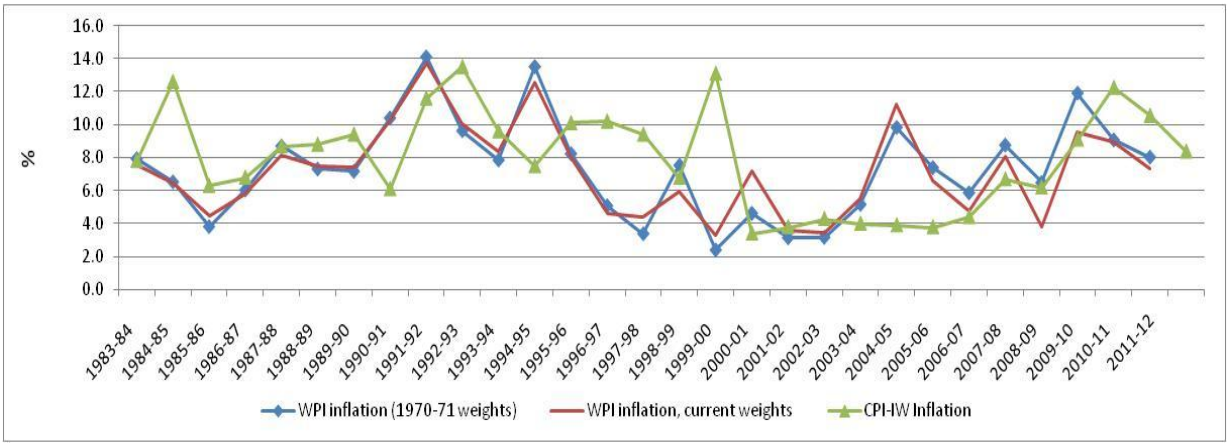
[35] WPI numbers (annual average) are considered from early 1980s up to 2011-12. First, the whole series is transformed into one base year i.e. 2004-05 (current). Thereafter the series is converted as per 1970-71 weights as shown in Table 6. However, there is one limitation in this method. Over time, items have been changed from one group to other, over the three broad groups are not strictly comparable from one base year to other.

Table 10: Revised weights for WPI for trend analysis

	Weights as per 2004-05 (current)	**Weights as per 1970-71 (oldest)**
ALL COMMODITIES	100	100
I PRIMARY ARTICLES	**20.11800**	**41.667**
II FUEL,POWER LIGHT & LUBRICANTS	14.91	8.459
III MANUFACTURED PRODUCTS	64.972	49.874

Source: Office of the Economic Adviser, DIPP, Ministry of Commerce and Industry

Figure 4: WPI Inflation with older higher weightage for food and CPI Inflation



Source: RBI

Until the mid-1990s, the red and blue lines track each other quite closely in the above figure which demonstrates that changing weights does not have a significant impact on WPI inflation (1970-71 weights). Moreover, it suggests that primary articles which include food articles, non-food articles and minerals did not contribute significantly to rising inflation (Figure 4). However, this trend changed from 2006-07 onwards and WPI inflation with current weights i.e. the blue line rose above the red line. Consequently, assigning higher weights to primary articles corresponds to higher inflation as compared to using the currently prevalent weights for WPI. The blue and green lines track each other better from 2007-08 demonstrating a better convergence between WPI inflation with higher weightage to food and CPI inflation post the global financial crisis. Additionally, a strong upward trend is apparent for WPI inflation which has a higher weightage for food items while CPI which is the green line is further away from the red line which represents WPI inflation with lower weightage for food. Clearly, therefore, food inflation has been a significant factor in determining headline inflation.

Causal factors for inflation

Extensive studies have examined causal factors for inflation[36] across countries around the world and have listed factors such as fiscal deficits, oil imports, surging domestic demand, low buffer stocks, changes in global and domestic consumption patterns, supply side constraints and higher than anticipated growth in money supply. Determinants for inflation in India has been recognised as high fiscal deficit, rising farm wages, domestic supply-side constraints, unexpected weather patterns, rise in international oil prices, rupee depreciation, increased demand, pass-through of global prices for input commodities such as coal, iron ore and aluminium, volatile capital flows and monetary accommodation.[37]

The average annual growth in broad money supply, M3, had just grown by 14.7 % during FY 2010 to FY 2014 compared to higher 19.1 % annual average growth during FY 2005 to FY 2009. Thereby, supporting the reasoning that capital flows have not necessarily altered the money supply to an extent to fan inflation. The remit of this paper does not extend to an extensive and fuller analysis of anti-inflation measures[38].[39]

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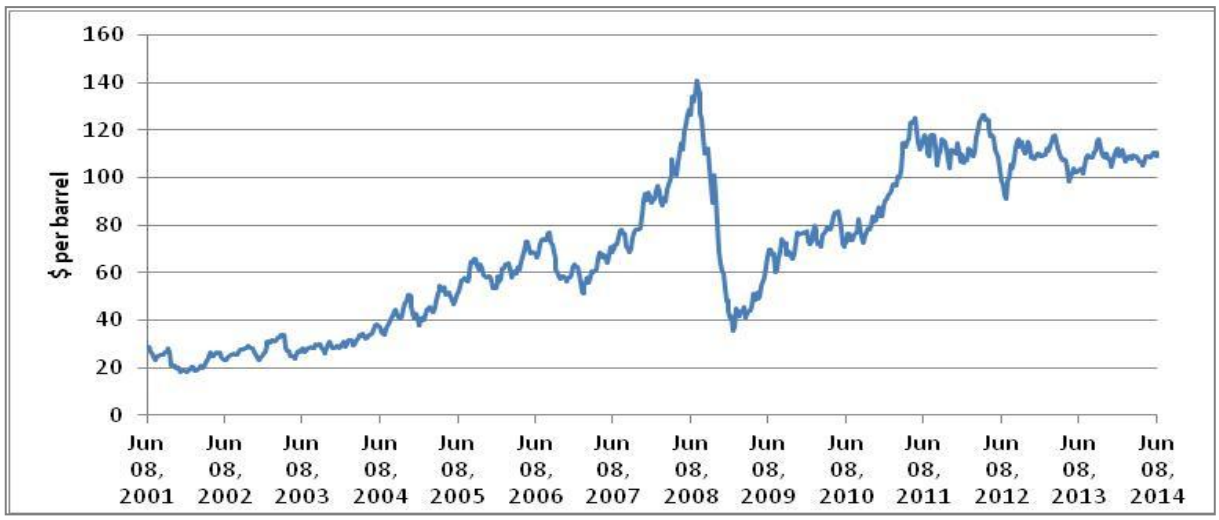
[36] A *monetarist view* links inflation to money supply in the medium-term. One of the solutions is to decrease money supply thereby increasing the rate of interest which should in turn reduce expenditures and ease the pressure on resources and thereby prices. The *Keynesian view* identifies inflation as a result of excessive expenditure relative to the available supply of goods at current prices. In this approach to explaining inflation, fiscal policy is deemed to be more significant, both as a cause and for purposes of control, than monetary policy. According to the Keynesian model, if money supply increases but does not influence spending, prices should not rise. However, if money supply contracts, the velocity of circulation of the reduced money supply would rise to negate the impact of a lower supply of money. Hence, reducing money supply would not reduce inflation rather result in unemployment. A proposed solution by Keynesians is to pursue an income policies which reduce inflationary expectations while decreasing expenditure to eliminate the "inflationary gap". A wage-price policy is advocated. The *Wage-Push view* approach believes that the labor unions have the power within the market process and this is reflected in a persistent tendency for money wage rates to increase faster than worker productivity. Further, these wage increases spill-over to non-union sectors as well. The *Mark-Up theory* states that inflation is caused by firms with market power taking advantage of their monopolistic status to increase profits and hence, changing the industry structure by introducing competition is a credible way to tackle inflation. Other views disaggregate inflation into demand rate of inflation (caused by government, fiscal and monetary policies), shock rate (caused by exogenous factors such as petroleum prices or increases in payroll taxes), and core rate (caused by inflationary expectations).

[37] Gulati and Saini (2013) attribute fiscal deficit, rising farm wages as major culprits.
RBI (Duvvuri Subbarao, Governor, RBI, 2009) attributes persisting Indian inflation to weather, oil prices, rupee depreciation, increase in wages and demand and impediments to monetary policy transmission.
Nair and Eapen (2012) conclude that supply-side constraints has been the major contributor.
Gokarn and Singh focus on import of inflation due to oil prices and pass-through of global inflation on commodities such as coal, aluminium and iron ore.
Patra, Khundrakpam and George (2013) attribute the persistence of inflation to oil and commodity price shocks, fiscal deficits, capital flows, depreciation and supply-capacity retardation.
Raj, Dhal and Jain (2008) have suggested that Indian inflation is influenced by import prices, capital flows and the Rupee's exchange rate.

[38] An IMF paper (Habermeier, K. etal., 2009) has reviewed developments related to inflation in 50 emerging and developing countries till 2008. One of the findings of this study is that "most central banks have tightened monetary policy to constrain aggregate demand and anchor inflation expectations, though the timing and speed of the monetary policy actions varied significantly. The effect of monetary tightening has been limited at the time of the writing, given the delayed actions in many countries, lags in policy transmission, and the magnitude of the tightening."

Figure 5: Europe Brent Spot Price



Source: US Energy Information Administration

Further, it can be seen in Figure 5 above, although oil prices have been rising since early 2009 the increase does not seem to have been significant enough post 2011 to list India's dependency on oil imports as the major reason for persistent inflation. One implication is that there are inefficiencies on the supply-side which have possibly pushed up domestic inflation. Looking for domestic causal factors for inflation compared to imported inflation, the Figure 6 shows that emerging as well as developed countries have experienced a lowering of inflation post 2008. However, India stands out in terms of inflation trending upwards.

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[39] Gulati and Saini (2013) list a few measures such as rationalisation in the pricing of fuel, food, fertilizers and power for efficient usage, containment of subsidy bills, liquidation of excessive grain stocks either in domestic markets or through exports and deregulation of the fertilizer sector. Longer term measures include increasing productivity to match rising farm wages via farm mechanisation, investments and so on and employing an active and variable tariff structure to implement stable, liberal and neutral trade policy.

Government of India (Budget Documents, 2005-06) suggests measures such as strict fiscal and monetary discipline, rationalisation of excise and import duties of essential commodities, effective supply-demand management of sensitive items through liberal tariff and trade policies and strengthening the public distribution system.

Kock and Ghaleb (1995) study the costs associated with fighting inflation for OECD nations. A few anti-inflation measures mentioned are structural policies to increase wage flexibility and foster more efficient labor markets. Arthur Okun suggests fiscal-monetary restraint, cost-reduction and price-wage restraint (Weidenaar, D 'Anti-Inflationary Policies: Alternative Approaches').

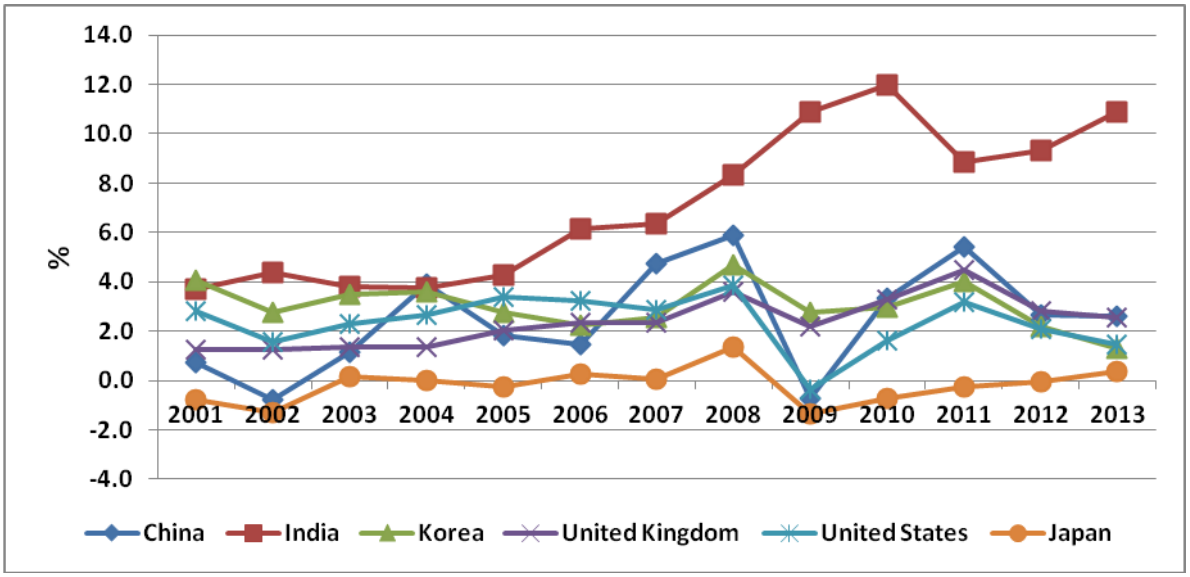
Barry Bosworth (Weidenaar, D 'Anti-Inflationary Policies: Alternative Approaches') suggests policies aimed towards restraining aggregate demand since monetary and fiscal policies have high social cost.

Lloyd Bentsen (Weidenaar, D 'Anti-Inflationary Policies: Alternative Approaches') suggests supply-side improvements, voluntary wage and price guidelines and stimulation of productivity growth.

John Galbraith (Weidenaar, D 'Anti-Inflationary Policies: Alternative Approaches') argues that restraints must be put in place e.g. trade union claims limited to increased productivity on average; large corporations must respect wage restraint and not increase prices. Profits of corporations must be in line with past experience.

George Meany suggests a comprehensive mandatory controls program covering *all* prices and *all* forms of income – profits, dividends, rents, interest rates, executive compensation and professional fees (Weidenaar).

Figure 6: Consumer Price Inflation



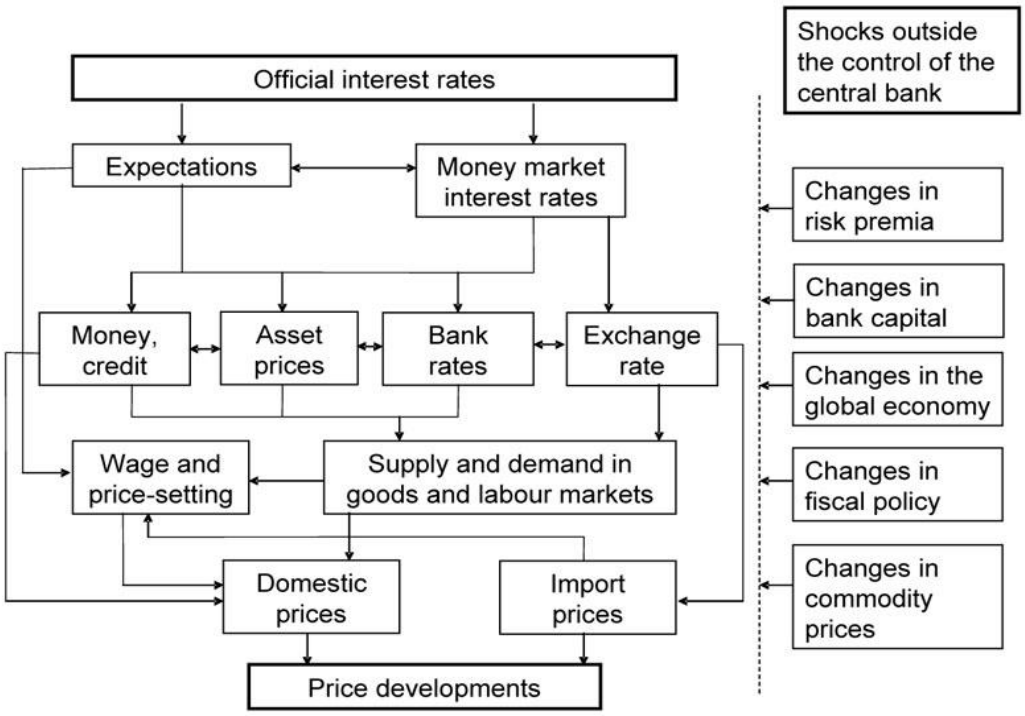
Source: International Finance Statistics, IMF

4.3 Report of the Expert Committee to Revise and Strengthen the Monetary Policy Framework

Two principal and traditional channels through which a central bank can impact inflation are by changing expectations and short term money market interest rates. In recent years, the central banks of the US and the UK have engaged in Quantitative Easing i.e. purchasing of long-term Treasury and mortgage based and other privately issued fixed income securities.

To implement monetary policy changes successfully in terms of their impact on economy wide variables, monetary authorities need to assess which mechanisms of monetary policy affect the economy in question and over what time frames. For instance, monetary transmission can be effected by a central bank changing its policy rates which should impact aggregate demand and price levels through various variables including lending rates, appetite for credit, stock prices, exchange rates and so on. This is illustrated in the following flow diagram.

Figure 7: Principal Transmission Channels of Monetary Policy



Source: ECB

To be specific, contractionary monetary policy raises short-term nominal interest rates (or policy rates). Thereafter, through a combination of sticky prices and rational expectations, real long-term interest rates rise as well, at least for a time.[40] The rise in real interest rates affects lending and deposit rates of commercial banks. The resulting increase in the cost of credit leads to a decline in business fixed investment, spending on housing, expenditure on consumer durables and inventory stocks which in turn results in a decline in aggregate output. In other words, it becomes more attractive for households to save rather than consume. The following schematic[41] explains this interest channel.

$$\mathbf{M \downarrow => i \uparrow => I \downarrow => Y \downarrow}$$

However, the transmission mechanism in practice is not always inevitable or as smooth as indicated above. Monetary transmission is usually characterised by long and uncertain time lags. Further, changes in real interest rates also affects the exchange rate such that when domestic real interest rates rise, domestic currency deposits become more attractive relative to deposits denominated in foreign currencies, leading to rise in value of domestic currency or appreciation of the currency (denoted by E). A higher value of the domestic currency erodes export competitiveness and could result in a fall in net exports (NX↓) and hence, fall

[40] Mishkin (1995)
[41] M denotes money supply, i denotes real interest rates, I stands for investment and Y refers to output.

in aggregate output. And, it may ease inflation due to cheaper imported goods and lower aggregate demand. The following is a flow diagram explaining the exchange rate mechanism:

M ↓ => i↑ => E↑ => NX ↓ => Y↓=> P (Prices) ↓

Concurrently, changes in policy rates impact equity prices which have consequent wealth effects on consumption. For instance, a rise in interest rates causes stock prices[42] to fall (denoted by P_e) which decreases financial wealth and therefore consumption spending declines and hence leads to a fall in aggregate demand.

M ↓ => i↑ => P_e ↓ => wealth↓ => consumption ↓ => Y↓ => P ↓

In brief, changes in policy rates lead to changes in consumption and investment which would change the level of domestic demand for goods and services relative to domestic supply. When demand is higher than supply, upward price pressures are likely to occur. As shown in Figure 7, changes in aggregate demand may translate into tighter or looser conditions in labour and intermediate product markets which in turn can affect price and wage-setting in the respective markets[43]. However, there is no consensus among economists about which transmission channels would dominate and under what circumstances[44]. In this context, recent empirical studies[45] suggest that the interest rate channel is stronger in many emerging economies including India.[46]

Monetarists suggest that inflation is ultimately always a monetary phenomenon and suggest that a rise in money supply translates into inflation even if it is with a medium-term lag. However, this causality is probably more likely to be true in developed economies, which have reached to fuller levels of employment. In emerging market economies which have excess capacity, inflation is not necessarily reined in by reducing money supply. In fact, empirical evidence seems to indicate that monetary tightening measures do not result in lowering inflation in India[47]. Moreover, inflation has been sticky in India even when growth in money supply has declined. As can be seen in Table 11, despite a consistent decline in

[42] Rise in interest rate may cause demand for bonds attractive relative to stocks, causing fall in stocks' prices.

[43] ECB - Transmission Mechanism of Monetary Policy

[44] According to Taylor, the interest rate channel dominates while Ben Bernanke and Marl Gertler see less empirical confirmation. Maurice Obstfeld and Kenneth Rogoff emphasise the importance of the exchange rate channel while monetary economists give more weight to asset price channels. Mishkin (1995).

[45] Mohanty, M.S. and P. Turner (2008); Aleem (2010), Gumata, N.,A Kabundi and E. Ndou (2013)

[46] In a recent IMF paper dated June 2013 titled "Inflation Dynamics and Monetary Policy Transmission in Vietnam and Emerging Asia" inflation in several Asian countries including India is compared. According to this paper: "An important finding from our analysis is that interest rates in Vietnam do not have seem to have a significant impact on headline inflation (as opposed to growth), neither in the short- term nor in the medium-term; in this sense, it can be concluded that the monetary policy transmission mechanism is weak in Vietnam." (Bhattacharya, 2013)

[47] Sabade Shubhada (2013) Available online at www.sciencedirect.com

broad base money growth, CPI inflation has increased steadily except mild drops during 2010-11 to 2011-12. Similarly, WPI inflation has gone up except for a few years. Further, sharp hikes in repo rate and CRR in 2009-10 did not soften CPI inflation although WPI inflation was moderated. Consequently, it appears that reduced money supply may not reduce Indian inflation and it suggests a greater role for non-monetary explanatory factors for inflation. Therefore, one of the usual causal factors for inflation, namely an increase in money supply has not apparently led to higher inflation.

Table 11: Monetary Indicators

	Growth rates			**Change during the year (in %)**[48]	
Year	**Broad money, M3 (%)**	**CPI**	**WPI**	**Repo rate (%)**	**CRR**
2006-07	21.7	6.7	6.6	1↑	1↑
2007-08	21.4	6.2	4.7	nil	1.5↑
2008-09	19.3	9.1	8.1	3↓	2.75↓
2009-10	16.9	12.2	3.8	0.25↑	0.75↑
2010-11	16.1	10.5	9.6	1.5↑	0.25↓
2011-12	13.2	8.4	8.9	1.25↑	1.25↓
2012-13	13.9	10.4	7.4	0.5↓	0.75↓
2013-14	13.3	9.7	6	0.5↑	No change

Source: Handbook of Statistics on Indian Economy, RBI

In the Indian context, it is difficult for the central bank to influence expectations to the same extent as developed countries since its written or verbal messages do not reach the population at large to the same extent. As regards money market interest rates, as will be mentioned later in this paper, there are several administered interest rates and multiple subsidies and government interventions which interfere with efficient price discovery of asset prices, money and credit. It is also possible that cash transactions, to evade detection by tax and regulatory authorities, are higher in proportion than in developed countries and to that extent reduce the effectiveness of signals emanating from RBI.

A Committee led by Dr. Urjit Patel, Deputy Governor, Reserve Bank of India submitted its Report on revising and strengthening India's monetary policy framework in January 2014. The report will be referred as "The Report" hereafter. The terms of reference of this committee included examination of an appropriate nominal anchor, review of instruments of monetary policy particularly a multiple indicator approach, liquidity management and measures to facilitate transmission.

[48] The percentage point change in repo rate and CRR are shown in the full fiscal year wherein upward (downward) arrows indicate a rise (fall).

In the past few years, RBI's concerns have included persistent high inflation, and sluggish growth. High inflation has resulted in relatively low real interest rates for savers for most of the post-global crisis period which tends to depress domestic savings[49]. To an extent external competitiveness too has eroded since inflation in trading partner countries has been relatively lower and the Rupee has not depreciated adequately. Demand for gold which, among its other benefits, is also is perceived as a hedge against inflation has contributed to deterioration in India's current account thus increasing its vulnerability to external shocks. Persistent inflation impacts allocation of resources negatively, impedes growth and worsens income distribution.[50]

The developed West is moving away from focusing principally on inflation to a multiple target-multiple instrument approach without diluting the commitment to price stability over the medium term. This RBI Report indicates that containing Indian inflation is of high priority at the current juncture and it is important to anchor inflationary expectations to set the context for addressing other objectives.[51]

A few salient features and observations of the Report are:

- CPI[52] chosen as a single nominal anchor[53] for future inflation targeting purposes after evaluating several other options for such an anchor including the real exchange rate, monetary aggregates among others
- Movement from a multiple indicator approach which was used from 1998-99 to 2008-09 to a nominal anchor for monetary policy
- Choice of CPI-Combined as the inflation measure to guide monetary policy
- Interest rate transmission mechanism to be utilised to influence lending rates for sizable sectors such as housing and automobiles[54]
- The exchange rate channel has been relatively weak
- Asset prices have reacted in a muted manner to interest rate changes
- Credit channel is relatively direct due to the significant dependence of the economy on bank finance[55]

[49] This can be seen from the trend of real interest rates as shown in Annex A
[50] Ibid., pp. 5
[51] Ibid.
[52] "*The Committee recommends that the RBI should adopt the new CPI (combined) as the measure of the nominal anchor for policy recommendations. The nominal anchor should be defined in terms of headline CPI inflation …"*, (The Report, pp. 18)
[53] *"…This nominal anchor should be set by the RBI as its predominant objective…",* (The Report, pp.11)
[54] RBI (2014), 'Report of the Expert Committee to Revise and Strengthen the Monetary Policy Framework', pp. 41
[55] Ibid., pp.44

- The Small Savings Schemes which carry administered usually higher interest rates have a competitive edge over the bank deposits reducing the effectiveness of the monetary transmission mechanisms at the margin and interest rate resets for such schemes should be more frequent[56]

Taking a step back to ponder on this Report's contents, high inflation can be tackled by reducing demand or augmenting supply. Policies targeting demand usually take effect more immediately. In contrast, supply-side measures including promotion of productivity gains take time to gather traction but tend to be more sustainable in the longer run.[57] As pointed out in the 2013 Economic Survey, the growth-friendly strategy to deal with inflation is to focus on boosting supply. RBI has limited options and curbing of demand in the short-term can have an adverse impact on growth. However, although there are difficult choices to be made in reducing inflation, the decision to switch from WPI to CPI is intrinsically sound since the former measures the impact on suppliers while the latter is closely correlated with end users and consumers. While WPI does not capture price movements in non-commodity producing sectors such as services, which constitute a significant proportion of the economic activity about 64.8%[58] including construction in 2012-13, CPI more closely relates to the cost of living for households[59]. And, the underlying rationale for policy changes and corresponding administrative steps is to protect consumers from inflation. Of course, the impediments to effective control over inflation are common to both WPI and CPI such as effectiveness of price discovery, transmission mechanisms and so on.

In India, it has been observed that an increase in interest rates has a depressing impact on housing costs only in the short-term. In the longer term, higher interest rates have a marginal impact on housing costs due to rising middle-class income and burgeoning of overall demand[60]. The Indian housing sector has a weight of 8.7% in Core CPI. This suggests that the interest rate route to manage inflation may not be sustainable over the longer term. The exchange rate channel too has been relatively weak[61] and this paper's remit does not extend to examining the same. The various mechanisms detailed in RBI's Report suggest a more independent monetary policy which would be capable of handling volatile capital flows,

[56] RBI (2014), 'Report of the Expert Committee to Revise and Strengthen the Monetary Policy Framework', pp.47

[57] This disproportionate effect is highlighted in the paper by Mohanty and Klau, 'What determines inflation in emerging market economies?', BIS Paper No. 8 which points out the larger impact of supply side factors on inflation – in turn due to growing trade openness of economies and flexible exchange rate regimes. It also finds high correlation between exchange rate and inflation volatility. The factors influencing price movements in Emerging Market Economies are affirmed as supply side factors, including large changes in the exchange rate/import prices and agricultural shocks.

[58] Economic Survey 2012-13, pp.3

[59] Bank of England (2013), 'Monetary Policy Trade-offs and Forward Guidance'

[60] Mahalik, M. K. and Mallick, H., 'What Causes Asset Price Bubble in an Emerging Economy? Some Empirical Evidence in the Housing Sector of India', IIT Madras, pp. 28

[61] RBI (2014), 'Report of the Expert Committee to Revise and Strengthen the Monetary Policy Framework', pp. 45

external shocks and exchange rate volatility. However, the Report does not specifically identify mechanisms to contain food and fuel inflation.

In the context of the impact of monetary policy on rural wage inflation, it has been observed that tightening has a mild effect on price inflation and no direct impact on reducing wage inflation. In contrast, fiscal measures have had a more consequences for rural wages.[62] Further, while Government spending does have a limited impact on rural food prices, it has subsequently led to some rise in productivity[63]. Monetary tightening seems to have little impact on rural wage inflation, a mild effect on rural price inflation and comparatively a larger compression in growth[64].

Monetary policy transmission can be expected to be impeded by pre-dominant fiscal policy. In this regard, the Report points out that biggest constraint to monetary targeting as lack of control over RBI's credit to the central government. [65] In addition, exchange rate volatility makes inflation management that much more complex and a stable exchange rate makes for better monetary transmission. Of course, the impact of exchange rate changes does not have to impact inflation if growth in reserve money is reduced through sterilisation interventions by RBI[66]. It is important to note that sterilised intervention to manage the Rupee exchange rate has significant costs. Interest rates paid on domestic government securities are higher than the yields RBI earns on their foreign exchange reserves[67]. At the same time, it needs to be recognised that higher nominal inflation and interest rates should result in a depreciating currency with its attendant benefits.

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[62] Goyal, A. and Baikar, A.K. (2014), 'Psychology, cyclicality or social programs: Rural wage and inflation dynamics in India', IGIDR

[63] As long as price rise has been associated with productivity increase, it accommodates moderate rise in real wages without affecting inflation. Conversely, real wages cannot rise in the long-term without an increase in productivity since inflation would persist until wages were brought in line with productivity.

[64] In the light of NSS surveys which state that 52.9% of total monthly per capita expenditure (MPCE) in rural areas is on food items and this number stands at 42.9% for urban areas. The second largest item of expenditure is fuel and power which was 8% and 6.7% of MPCE for rural and urban areas respectively in 2011-12. The impact of monetary policies on containing inflation via the standard transmission presents a somewhat unconvincing picture.

[65] However, fiscal dominance over monetary policy has significantly reduced over the years. A series of auctions of 182-day Treasury bills from November 1986, 364-day Treasury bills from April 1992, and 91-day Treasury bills from January 1993 to finance Government debt enabled a sizeable reduction in monetization of deficits, which helped to moderate fiscal dominance of monetary policy. The automatic monetisation of fiscal deficit through issuance of ad-hoc Treasury bills had been phased out. Moreover, the Fiscal Responsibility and Budget Management (FRBM) Act, 2003 was enacted to curb the monetisation of debt. Namely, it prevented the Reserve Bank from subscribing to primary issuance of Government securities from April 1, 2006. Since then, RBI has been periodically engaging indirect monetisation of fiscal deficits by conducting open market operations which undermines the credibility of discretionary liquidity management operations. Source: Report on Currency and Finance (2013), RBI

[66] Mohanty and Bhanumurthy (2014), " Exchange Rate Regimes and Inflation: Evidence from India" , NIPFP Working Paper No. 2014-130

[67] Devereux and Yetman, "Responding to exchange rates in a globalised world", BIS Papers No 77; Mohan and Kapur (2009)

The Report suggests increasing the frequency of resets for the Small Savings Schemes which carry administered interest rates[68]. Table 12 lists the administered rates used for various savings schemes in India.

Table 12: Administered Interest Rates

Year	GPF Rate of Interest	EPF Rate of Interest	PPF Rate of Interest	5-year Post Office Recurring Deposit Account	5-year National Savings Certificate	10-year National Savings Certificate	Public Provident Fund Interest
2013-14	8.70%	8.75 %	8.80 %	8.30%	8.50%	8.80%	8.60%

Source: http://ag36g.cag.gov.in/GPFInterest.aspx; http://www.epfindia.com/sites/pdf/InterestRate_OnPFAccumulationsSince1952.pdf; http://www.indiapost.gov.in/posb.aspx; http://www.tnsmallsavings.com/schemedttot.htm; http://www.unionbankofindia.co.in/personal_govt_ppfund.aspx;

The Employee Provident Fund (EPF) had a corpus of Rs. 3 lakh crores in 2011-12. The assets under the National Small Saving Fund which includes various Postal Office Saving Schemes is estimated at Rs. 8.6 lakh crores in 2011-12.[69] GPF subscriptions can be assumed to be of similar enormity. State Provide Funds amount to about 1.5% of GDP and are administered by the Central Government. The interest rate on this liability was 8% for 2010-11.[70] Based on AMFI data, the AUMs of all mutual funds as of March 2012 were Rs. 5.87 lakh crores. These administered interest rate schemes including provident funds represent a significant share of financial savings and adversely impact RBI's ability to alter financial savings behavior and consumption by changing short-term rates.

In addition to the above mentioned points, the Report also presents the liquidity framework and highlights issues faced by RBI. The challenges to effective liquidity management have included large fluctuations in the central government's balances with the RBI and forex market intervention. The operating framework is anchored with an interest rate rule since empirical estimates point to money demand responding to interest rate changes. It is highlighted that standing sector-specific refinance facilities interfere with monetary policy transmission because of assurance of additional access to liquidity at fixed rates (not market determined). [71] To further strengthen the ability of RBI to manage liquidity, longer-term repos have been suggested. However, use of the longer-term repos to mop up liquidity particularly as a result of foreign exchange reserves intervention may lead to segmentation of

[68] The frequent changes in the cap ($30 billion) on foreign investments in government fixed income securities create market uncertainty and to that extent complicates RBI's monetary policy choices.

[69] Ministry of Finance, Comprehensive review of NSSF, June 7, 2011

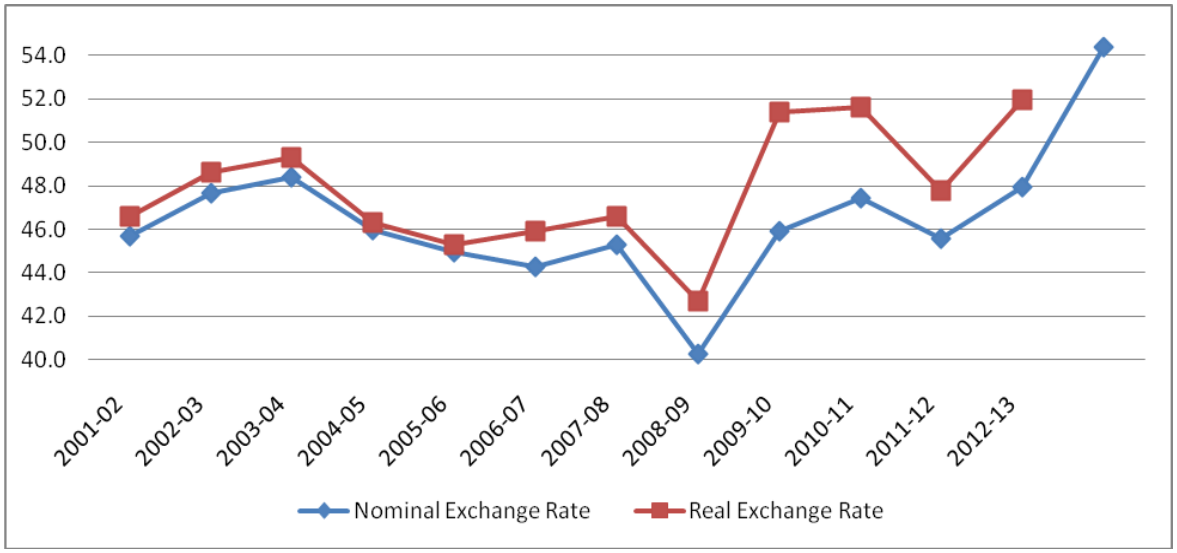
[70] Government Debt, Status Paper, March 2012, Ministry of Finance

[71] The Report, pp. 33-34

the already comparatively shallow domestic sovereign bond market[72] (promoting the development of government bond markets is in the interest of monetary policy transmission effectiveness and hence, RBI[73]). This could also raise the issue of conflicting objectives: preference for longer-term paper to reduce the need to roll it over and inclination towards short-term instruments for day-to-day liquidity operations. This may lead to undesirable consequences for monetary transmission mechanisms.[74] According to Riksbank, the impact on inflation due to changes in repo rates is over the medium-term and hence, reliance on longer-term repos may delay the impact further.[75]

The Indian Rupee- US$ nominal and real exchange rates, India's total FX debt and short-term debt defined as FX debt with remaining maturity of one year, FX reserves (all as % of GDP) and import cover in number of months are shown in Figures 8, 9 and 10 respectively.

Figure 8: Rupee – US$ Nominal and Real Exchange Rates[76]



Source: RBI and IMF

[72] Filardo, A., Mohanty, M. and Moreno, R., 'Central bank and government debt management: issues for monetary policy', BIS Papers No. 67

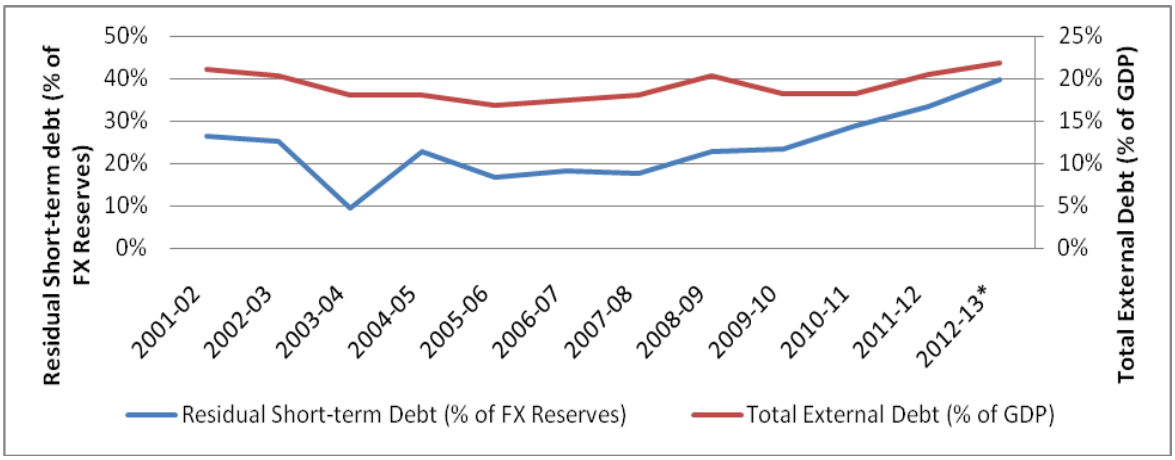
[73] Harun Khan, Deputy Governor, RBI, 'Promoting Retail Investor Participation in Government Bonds', RBI

[74] Filardo, A., Mohanty, M. and Moreno, R., 'Central bank and government debt management: issues for monetary policy', BIS Papers No. 67

[75] http://www.riksbank.se/en/Monetary-policy/Forecasts-and-interest-rate-decisions/How-changes-in-the-repo-rate-affect-inflation/

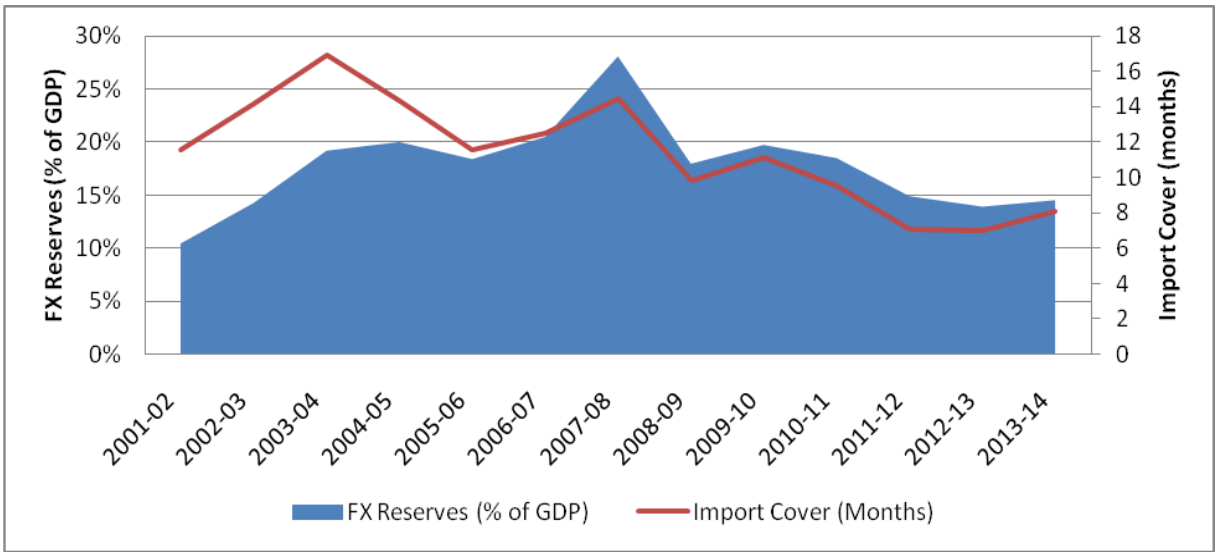
[76] Real Exchange Rate between Indian Rupee and the US$ has been calculated simply as Nominal Exchange Rate *(1 + Domestic Inflation)/ (1 + US Inflation)

Figure 9: Composition of Overall External Debt of India[77]



Source: Ministry of Finance, India's External Debt, A Status Report, 2012-13

Figure 10: India's FX Reserves and Import Cover



Source: RBI

FX reserves, as a percentage of GDP, have declined over the last 5-6 years. This declining trend is also apparent for the number of months of import cover and short-term FX debt as a percentage of FX reserves has risen steadily over the last ten years[78]. This presents an unfavorable picture about the adequacy of India's FX reserves.[79] The Report states that ,

[77] Residual Short-term Debt is calculated as the sum of Short-term debt payable within one year + the portion of repayment obligation of Long-term debt maturing within one year

[78] Short-term debt defined as all debt which is due within 1 year (long-term debt maturing within the year + short-term debt)

[79] Due to higher Indian inflation, the rupee should, all other factors held constant, be expected to depreciate correspondingly in nominal terms over time. The inflow of foreign capital tends to make the rupee appreciate at a minimum in real terms and sometimes even nominally depending on the volumes of inflows. As can be seen in Figure 7, the rupee has appreciated in real terms against the US$ during the last 5 years. This should

"*large inflows in excess of the absorptive capacity of the economy created concerns about erosion in external competitiveness through exchange rate appreciation…*"[80] which the paper appears to perceive as an outcome of inflation targeting since exchange rate appreciation dampens inflation to some extent. In RBI'S opinion its ability to conduct effective Open Market Operations (OMOs) through MSS was constrained due to limited availability of government securities[81].[82] RBI's proposed amendment to the RBI Act to enable the RBI to absorb surplus liquidity without the need for collateral would necessarily require detailed consideration by the Government and approval by Parliament. In the interim, this paper recommends closer coordination with Government to borrow government securities held by FIs, PFIs and PSUs (due to mandatory holding requirements) to augment the effectiveness of OMOs.

In stark contrast to a statement in the Report, *"... inflation should be the nominal anchor for monetary policy framework ... nominal anchor should be set by the RBI as its* ***predominant*** *objective of monetary policy…*"[83], the then RBI Governor, D. Subba Rao, had suggested that inflation targeting is neither possible or advisable for RBI as Indian inflation is influenced by a number of factors other than excess demand. According to the previous RBI Governor, the Indian economy is dependent on imports and has to deal with volatile capital flows, decisions of other central banks, trade channels which cause inflation, vulnerability of agriculture prices to monsoon and adverse weather conditions and more.[84] The following are a few of the reasons provided by RBI in 2009 why inflation targeting is neither desirable nor practical in India:

- It is unlikely that in an emerging economy such as India, the central bank would push exclusively for a single goal oblivious of the larger development context. The RBI would probably have to be guided simultaneously by the objectives of price stability, financial stability and growth
- Food items which have a large weight in consumer price indices are vulnerable to large supply shocks, especially because of the vagaries of the monsoon. An inflation targeting regime cannot do much to tame supply-driven inflation
- It is not possible for an emerging market economy such as India with market imperfections, diverse geography and 1.1 billion people to develop a single representative inflation index

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have had a dampening effect on inflation *ceteris paribus*. Similarly, an outflow of FX should have the reverse effect fanning inflation.

[80] The Report, pp. 59

[81] The Report states, "*Reverse repos and outright OMO sales demanded the availability of adequate stock of government securities with the RBI, which became a constraining factor in sterilization operations as the volume of capital inflows expanded.*"

[82] The Report, pp. 40

[83] The Report, pp. 11

[84] RBI Speech, July 2, 2009, Available at < http://rbi.org.in/scripts/BS_SpeechesView.aspx?Id=427>

- The monetary transmission mechanism is impeded because of large fiscal deficits, persistence of administered interest rates and illiquid private bond markets
- A boom-bust pattern of capital flows can lead to large disorderly movements in exchange rates rendering both inflation targeting and financial stability vulnerable[85]

This was a substantially different RBI position in the past[86,87]. Most of these factors standing in the way of an efficient conventionally understood inflation targeting regime still appear to hold true.

On a separate note, ECB President Mario Draghi has pointed out the dangers of lowering interest rates in the context of a flagging economy when inflation is already high[88]. Former Bank of England Governor Mervyn King has commented that central banks need to go beyond containing inflation and be mindful of financial stability[89]. He has also highlighted the importance of supply-side policies.[90] The former Chairman of the Federal Reserve Board, Ben Bernanke, commenting on inflation targeting at Kotak Presidium in Mumbai on 15th April 2014 said, "*I have been very supportive of inflation targeting. Monetary policy benefits from clarity and transparency. It really helps people know what you are trying to achieve. Particularly in a country where inflation has been high, setting a target, even if higher...it tells markets what to expect.*"[91] In the light of the 2008 financial-economic breakdown experience around the world and the above mentioned and other similar views this paper recommends use of a multiple-objective approach[92]. For example, inflation targeting even as

[85] Duvvuri Subbarao, Governor of RBI, 'Global financial crisis – questioning the questions', Available at < http://www.bis.org/review/r090806a.pdf>

[86] This difference in stance is also reflected in the 2008 comments of ex-RBI governor YV Reddy when he said, "*India is not an inflation-targeting country…the two groups of commodities that carry a large weight in the consumption basket, namely food and fuel, are subject to supply shocks, making it difficult to identify a 'core' that could be meaningfully targeted…*"

[87] The difference in opinion can be seen in the Report of the Committee on Financial Sector Reforms, 2009 chaired by Dr. Raghuram Rajan when he stated, "*the RBI can best serve the cause of growth by focusing on controlling inflation, and intervening in currency markets only to limit excessive volatility…*" (carried in Urjit Patel Report to Revise and Strengthen the Monetary Policy Framework, pp. 10)

[88] "*…presence of heavily indebted private and public sectors with large open foreign exchange positions, central banks have little space for manoeuvre when faced with a flagging economy. This is especially true when inflation is already high…In these circumstances, lowering the policy rate to stimulate the economy may risk sparking depreciation pressures on the domestic currency … in turn fuel inflation and offset the impact of economic stimuli…",* (Speech by Mario Draghi, December 2012

[89] In light of costs such as the financial crisis of 2008, he suggests monetary policy to go beyond targeting price stability and also target financial stability (Mervyn King (2012), 'Twenty years of inflation targeting', Bank of England)

[90] Interview/Mervyn King, 'Inflation targeting welcome but policy instruments hard to come by', Available at http://ajw.asahi.com/article/views/opinion/AJ201303160009

[91] However, he added the caveat that a focus on inflation should not mean the central bank ignores everything else. Available at http://articles.economictimes.indiatimes.com/2014-04-16/news/49185226_1_rbi-governor-raghuram-rajan-kotak-mahindra-bank-ben-bernanke

[92] The global financial crisis has proved that policymakers have to gauge many targets along with the traditional indicators. For instance, monetary policy should not only target price stability but needs to introduce regulation tools. Evidence suggests that Central Banks that target inflation have also intervened in foreign

the predominant anchor for monetary policy could work against FX reserves accumulation as a way of addressing sharply higher capital inflows[93]. The Report comments on the issue of inadequate foreign exchange reserves[94] and recommends building up of reserves during periods of inflows. However, the Report perceives this as a conflicting objective to that of containing inflation.

In the above context, macro-prudential oversight and monetary policy impact on the financial system is now within the purview of the Financial Stability and Development Council (FSDC). FSDC is headed by the Finance Minister and includes financial sector regulators and senior officials of the Ministry of Finance[95]. It was set up by the Government of India in 2010[96] for better inter-regulatory coordination and promotion of financial stability. The following tasks have been listed for this body:

- Macro prudential supervision of the economy, including the functioning of large financial conglomerates
- Address inter-regulatory coordination issues
- Focus on financial literacy and financial inclusion
- Coordinating India's international interface with financial sector bodies such as the Financial Action Task Force (FATF) and Financial Stability Board (FSB)
- Issues related to financial development[97]

In the recent meeting of the Council, held on June 7 2014, the Finance Minister stressed the need to improve the climate for business and reduce the costs of doing business in order to revive stalled investments in the economy.

In addition to this Council, a FSDC sub-committee has been set up which is headed by the Governor of RBI. It is expected to meet more often than the full Council[98].

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exchange markets to smooth volatility and influence the level of exchange rate. Source: Blanchard et al (2010)

[93] Since the primary objective may be in conflict with the policy, "*…inflation is the RBI's primary objective and that it expects to be held accountable for its performance in this regard."*, (The Report, pp. 13)

[94] The Report states, "…*if the foreign exchange reserves are not perceived to be adequate, monetary measures to avert a free fall in the exchange rate may not be very effective.*" (pp.61)

[95] FSDC is headed by the Finance Minister and the members are the Governor of Reserve Bank of India and the heads of the Securities and Exchange Board of India (SEBI), Insurance Regulatory and Development Authority (IRDA), Pension Fund Regulatory and Development Authority (PFRDA), and Forward Markets Commission (FMC). In addition, Finance Secretary and/ or Secretary of Department of Economic Affairs (DEA), Secretary of Department of Financial Services (DFS) and Chief Economic Adviser of the Ministry of Finance are members of this Council. The Council can invite experts to its meetings if deemed necessary.

[96] It should be noted that the FSDC is not a statutory body. The Financial Sector Legislative Reforms Commission (FSLRC) has recommended that the FSDC should be a statutory body in order to have operational and financial autonomy. This suggestion was opposed by the former Governor of the Reserve Bank of India. He felt that the role of the Council should be limited to that of a "coordination body".

[97] Press Information Bureau, Government of India

A separation of tasks in relation to financial stability has been attempted by other countries in the light of the crisis of 2008[99]. The BIS has observed in this regard that "prudential tools that target financial stability need to be calibrated at the level of the financial system but implemented at the level of each regulated institution". Similarly, the European Commission has set up the European Systemic Risk Board in charge of macro prudential oversight to enhance effectiveness of early warning mechanisms.[100] In the UK, a Financial Policy Committee will be created within the Bank of England which will track the wider economic and financial risks to the stability of the system.[101]

4.4 Inflation Targeting in India in the context of Distorted Price Discovery Mechanisms

In broad terms, the problem of sustained food inflation in India could be attributed to the mismatches between the relatively larger income elasticities of demand for farm products and lower price elasticities of supply in the short and even medium-term. Macroeconomic policies which induce significant increase in demand for farm products when supplies cannot be enhanced conceivably cause significant upward price impact[102]. For instance, fiscal stimulus provided by the government even ahead of the global financial crisis resulted in a rise in the central government's fiscal deficit and lead to rising prices. Rising prices would usually be implicit in revenue expenditures which are consistently above revenue receipts. Under such circumstances, tighter monetary policies can be expected to have a slower impact on containing inflation while it has a relatively faster dampening effect on investment[103.] Clearly and somewhat simplistically, longer term solutions lie in correcting supply-side bottlenecks. It calls for investment in large volume supply chains starting with high yielding seeds, investment in irrigation facilities, warehousing and efficient retail chains[104] and all this calls for proactive and effective administration.

Governor, RBI's intervention on *Fighting Inflation* delivered at the FIMMDA-PDAI Annual Conference on 26th February 2014 provides a detailed exposition on Indian inflation. It was explained that the food basket with 48% weight for all India CPI does explain overall inflation to a large extent during April 2012 and January 2014. Housing and Fuel & Lighting contribute about 20% and 11% respectively to all India CPI for the same period. As food prices are a significant explanatory factor, irrespective of which measure of inflation is chosen, it is pertinent to review to what extent the prices of agricultural commodities are determined efficiently in India.

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[98] This Sub-committee has met 12 times whereas the full Council has met 11 times so far.

[99] A new Council of regulators consisting of the heads of the Treasury, SEC, CFTC and the Fed has been created to supplement the Fed's role to ensure financial stability.

[100] http://www.esrb.europa.eu/home/html/index.en.html

[101] http://www.bankofengland.co.uk/financialstability/Pages/fpc/default.aspx

[102] (Thompson, 1988)

[103] Rangarajan and Sheel (2013)

[104] Gulati and Saini (2013)

Agricultural markets continue to be fragmented in India. Prices of agriculture commodities are influenced by Central and State government interventions at several stages. From sowing of crops to selling of agricultural produce, prices of inputs and crops continue to be distorted. Minimum support prices (MSPs) declared by Government before sowing for [24] agricultural items, constitute more than one-third of primary articles in the WPI. MSPs are meant to incentivise farmers to shift towards higher priced MSP crops such as wheat and rice from low yielding crop and it follows that this distorts price discovery[105]. Agricultural products acquied at MSP result in higher than otherwise market prices at the retail level. Further, state governments declare their own bonuses above MSPs from time to time. For example, the Tamil Nadu government offered a bonus of Rs 50-70 per quintal and Bihar Rs 250 per quintal on procurement of paddy for fiscal 2013-14. A table listing minimum support prices (MSPs) is provided in Annex E highlighting Government's intervention in the agricultural market and upward revision in MSP on a regular basis. Concurrently, agricultural inputs such as fertilisers, irrigation, agricultural credit are invariably provided at prices lower than the prices which would determined by market processes resulting probably in higher margins for intermediaries rather than farmers. Furthermore, prices of fruits and vegetables which account for high price votality items among food articles in WPI as well as in CPI are subject to Agricultural Produce Market Committee (APMC) Acts. It is likely that the repeal of these acts would enable farmers to sell their produce more freely including to APMC regulated markets. Consequently, less regulated flow of perishable goods would result in better price discovery which should be beneficial for consumers and producers. An analysis of the paddy market reveals Government's interventions in buying paddy at MSP is costly since the objective of protecting farmers' revenues can be met through purchases of levy rice from millers which reduces the government's fiscal and managerial burden[106]. Various studies have been conducted to ascertain the effectiveness of policies on the supply side in India and particularly in the agricultural sector. India ranks among the highest in emerging economies in terms of distortions to world trade due to trade barriers, import restrictions and domestic support either through subsidies or minimum support prices[107]. This point is emphasised by Gulati et al. (2008).

According to FCI, approximately 30% and 36% of the total production of wheat and rice is procured by Government at MSPs. The fertilizer subsidy was about Rs. 90,000 crore (~1% of GDP)[108] for the 2012-13 fiscal year[109]. The total subsidy on petroleum products in 2012-13 was Rs. 96,880 crore (~1% of GDP)[110] and the support for oil marketing companies from

[105] RBI 2014, Fighting Inflation- Raghuram G. Rajan

[106] Gupta, N. (2010), 'Reserve Prices, Minimum Support Prices and Farmers' Revenues: Government Grain Policy through the Prism of Rice Auctions in North India', Delhi School of Economics, University of Delhi

[107] Anderson, K., Martin, W. and Mensbrugghe, D. (2005), 'Distortions to world trade: impacts on agricultural markets and farm incomes', World Bank Policy Research Working Paper 3736

[108] Ministry of Chemicals and Fertilizers

[109] Fertilizer subsidy was reduced in 2013-14 to about 0.6% of GDP (Budget Documents)

[110] Ministry of Petroleum and Natural Gas

upstream oil companies was Rs. 60,000 crore (~0.65% of GDP)[111]. The quantum of subsidy provided by State Governments to all electricity utilities was about Rs. 25,832 crores (~0.25% of GDP) in 2011-12[112]. Interventions at these levels result in distortions in the price discovery processes, weakening monetary policy transmission mechanisms.

International trade in agriculture continues to be regulated through tariffs on imports or stop-go bans on exports although this trade has been significantly liberalised over the years. For example, exports of non-basmati rice were banned in April 2008 and were reallowed from September 2011. Similarly, exports of wheat were banned for the same period. Moreover, India restricts wheat exports from time-to-time according to the domestic demand-supply situation. It is likely that such ad-hoc administrative decisions have not benefited Indian farmers or consumers in any sustainable sense. For instance, after the removal of the ban on export of regular rice in September 2011, India has emerged as the world's largest rice exporter in 2012. Customs duties on import of cereals hover in the range of 50-80% whereas pulses attract zero import duty as domestic production barely meets domestic demand. In the case of maize there has been no government intervention and India has emerged as a large exporter[113]. Unpredictable government interventions ostensibly to protect the interest of producers or consumers distort price discovery, hence transparent and sustained trade policies are required for farm products for a competitive and buoyant agricultural sector.

[111] Ibid.
[112] Performance Report on State Power Utilities, Power Finance Corporation Ltd, pp.viii
[113] Gulati et al (2013), Farm trade: tapping the hidden potential

Section 5

Conclusions

- In India, price data collection has been more systematic for CPI than for WPI. CPI price surveys are conducted on an all-India basis at regular intervals while WPI price data is not collected on any fixed periodicity basis and there are no pan-India collection centres. As food inflation accounts for more than 50% of CPI inflation, combined CPI provides adequate weightage to expenditure on food products and hence is a preferable inflation measure in terms of consequences for the population at large. Moreover, CPI inflation is closely related to household expenditure and better reflects the cost of living. Evidence from select OECD countries suggests that a single price index is invariably targeted for monetary policy formulation despite the availiability of multiple price indices. It follows that the Urjit Patel Committee Report's recommendation to use CPI inflation for monetary policy decision making is timely (Sections II, III, IV.I & IV.II).

- In India, several government bodies are collectively responsible for the compilation and release of price indices which is not the case in the US, UK or Germany. Accountability for efficient and reliable data collection should preferably be housed in one institution to curb duplication of effort and expenditure. That is, the overall responsibility and accountability for estimating Indian price indices should be housed in one central government body to maintain consistency of follow up action and to improve domain expertise (Sections II & III).

- Discretionary fiscal measures and global financial conditions affect the efficacy of monetary transmission mechanism. Additionally, to enhance monetary policy effectiveness, administered interest rates on savings in GPF, EPF, PPF and Postal savings schemes need to be progressively dropped. In this environment, an enhancement in RBI's role as communicator and inclusion of projected fiscal developments in well explained statements in a coordinated manner with Government would help in lowering inflation expectations (Section IV.III).

- Due to transmission impediments and the nature of second order effects of policies, targeting and controlling consumption patterns present a difficult challenge and hence monetary policies may impact exchange rates more immediately. That is, raising interest rates could lead to FX investments in Rupee Treasury bills resulting in upward pressure on the Rupee exchange rate in the short-term rather than on inflation (Section IV.III).

- From reviewing the recommendations of the Urjit Patel Report, it is found that the Report does not explicitly identify the policies to be adopted when RBI's objectives are conflicting such as building up of foreign exchange reserves can be in conflict with the objective of containing inflation. (Section IV.III).

- The Indian central and state government interventions via subsidies, tariffs and MSPs distort prices and to that extent price discovery is sub-optimal. As such, monetary policies can be expected to have less than the expected impact on food prices particularly on rural headline inflation. Rural household expenditure is relatively higher on food products than urban households. This combined probably with a lower impact of monetary policies on agricultural wages/incomes compared to industrial wages, the depressing impact on the growth in the shorter term could possibly be higher than the constraining impact on rural food inflation. Such differences in the inter-temporal impact on wages can be expected to vary between regions and over time (Section IV.IV).

- A related and current issue is whether RBI should target headline CPI or core CPI. At first blush, it seems appropriate that RBI should target core inflation since it excludes volatile price items such as food and fuel. Moreover, inflation in food and fuel would be better addressed by correcting supply side constraints. However, using core CPI inflation would defeat the purpose of switching from WPI to CPI inflation. As discussed in Section IV, price discovery mechanisms for agricultural products are distorted. Hence it is not meaningful to focus only on core inflation rather than broader measures which include movements in food and fuel prices. Concurrently, it has to be accepted that any central bank's ability to constrain headline inflation is limited. Hence, as the RBI Report suggests a multipronged approach needs to be adopted to meet the objective of price stability (Section IV.IV).

- Lastly, this paper recommends that the FSDC could periodically and systematically assess the impact of fiscal and monetary policies on headline and core CPI and suggest coordinated action. (Section IV.III).

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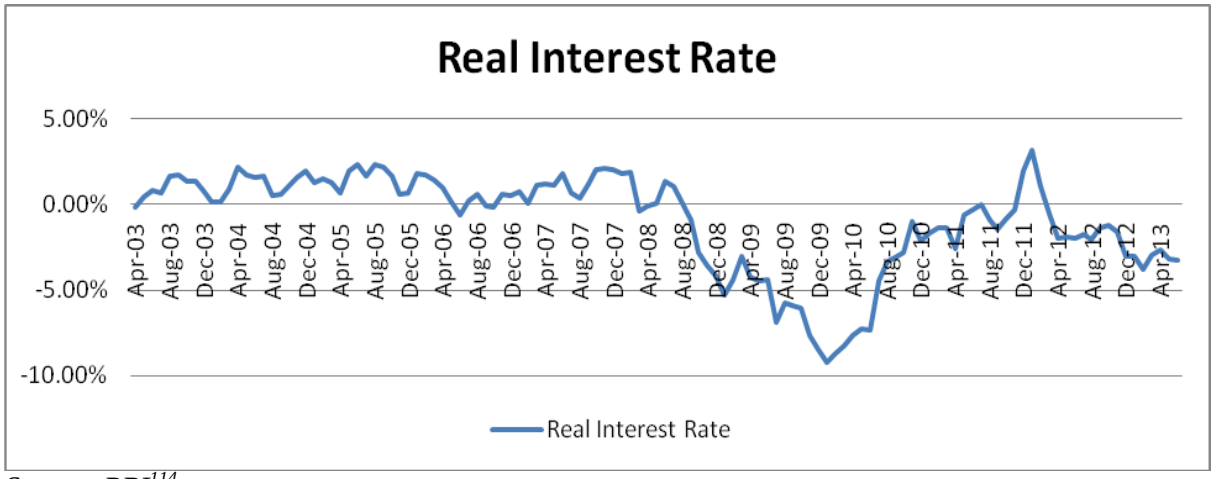
Annex A: Real Interest Rates in India



Source: RBI[114]

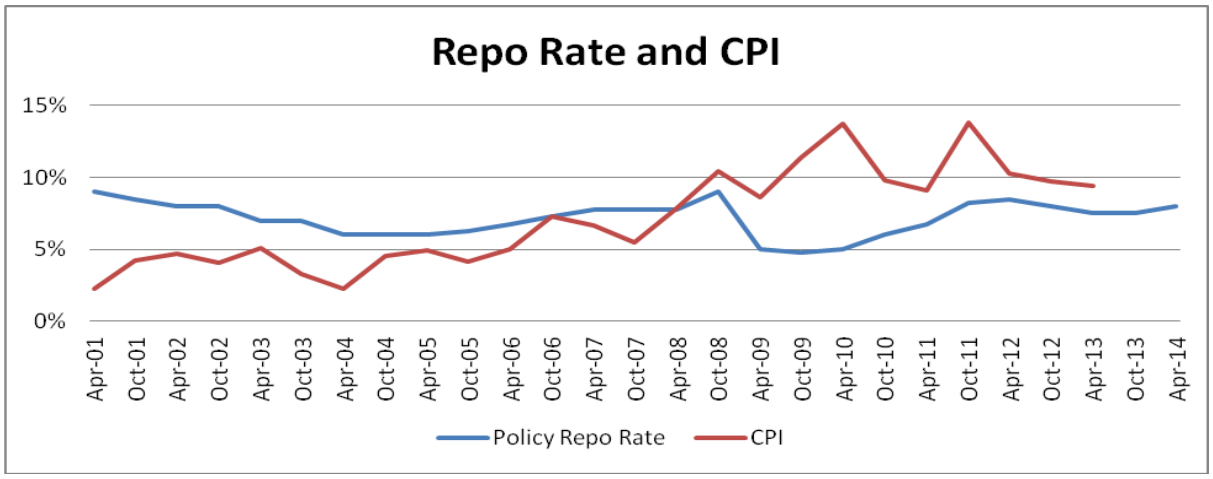
Annex B: Fiscal Deficit trend in India

	Central Government Fiscal Deficit [% of GDP]	Central Government Net Primary Deficit [% of GDP]	Central Government Primary Revenue Deficit [% of GDP]	Central plus State Government Fiscal Deficit [% of GDP]
2013-14	4.69%	1.58%	3.27%	6.90%
2012-13	5.10%	2.13%	3.6%	7.20%
2011-12	5.70%	2.91%	4.39%	8.10%
2010-11	4.80%	1.88%	3.24%	6.90%
2009-10	6.50%	3.40%	5.23%	9.30%
2008-09	6%	2.80%	4.5%	8.30%
2007-08	2.54%	-0.88%	1.05%	4.09%
2006-07	3.32%	-0.18%	1.87%	5.37%
2005-06	3.97%	0.37%	2.5%	6.49%
2004-05	3.88%	-0.04%	2.42%	7.19%
2003-04	4.50%	-0.03%	3.57%	8.18%

Source: Economic Survey 2012-13; RBI; Planning Commission

[114] The real interest rate is calculated by subtracting the CPI-IW inflation recorded with the Base CPI-2001 as 100 from the 1-Year Treasury yields. The data is taken from RBI.

Annex C: Repo Rate and CPI



Note: CPI (AL) series is used till 2011 and CPI (combined) numbers are being used from 2012 onwards

Source: RBI

Annex D: Time-Series of Repo-rates, Bank Rates and Growth rate of M3

Year	Repo Rates*	Bank Rates*	Cash Reserve Ratio*	Yearly Growth rate of M3
Mar 1989 -Apr-1990	-	10.0%	15%	19.0%
Mar 1990 -Apr-1991	-	10.0%	15%	17.1%
Mar 1991- Apr-1992	-	12.0%	15%	16.7%
Mar 1992- Apr-1993	-	12.0%	15%	17.7%
Mar 1993 -Apr-1994	-	12.0%	14%	15.9%
Mar 1994 - Apr-1995	-	12.0%	15%	19.8%
Mar 1995 -Apr-1996	-	12.0%	14%	15.6%
Mar 1996 -Apr-1997	-	11.0%	10%	16.2%
Mar 1997 - Apr-1998	-	10.5%	10.25%	17.0%
Mar 1998 -Apr-1999	-	8.0%	10.5%	19.8%
Mar 1999 -Apr-2000	-	7.0%	9%	17.2%
Mar 2000 -Apr-2001	9.0%	7.0%	8%	15.9%
Mar 2001 -Apr-2002	8.0%	6.5%	5.5%	16.0%
Mar 2002 - Apr-2003	7.0%	6.3%	4.75%	16.1%
Mar 2003 - Apr-2004	6.0%	6.0%	4.5%	13.0%
Mar 2004 - Apr-2005	6.0%	6.0%	5%	14.0%
Mar 2005 -Apr-2006	6.8%	6.0%	5%	15.9%
Mar 2006 -Apr-2007	7.8%	6.0%	6%	20.0%
Mar 2007 -Apr-2008	7.8%	6.0%	7.5%	22.1%
Mar 2008 -Apr-2009	5.0%	6.0%	5%	20.5%
Mar 2009 - Apr-2010	5.0%	6.0%	5.75%	19.2%
Mar 2010 -Apr-2011	6.8%	6.0%	6%	16.1%
Mar 2011 -Apr-2012	8.5%	9.5%	4.75%	15.8%
Mar 2012 - Apr-2013	7.5%	8.5%	4%	15.4%
Mar 2013 -Apr-2014	8.0%	10.3%	4%	13%**

* These numbers are as of 1st April of the year

** Projection according to RBI

Annex E: Minimum Support Prices

Minimum Support Prices (Rs. Per quintal)
(According to Crop Year)

Sl. No.	Commodity	Variety	2009-10	2010-11	2011-12	2012-13	(#) increase in MSP 2012-12 over 2011-12	2013-14	(#) increase in MSP 2013-14 over 2012-13
	KHARIF CROPS								
1	PADDY	Common	950$	1000	1080	1250	170(15.7)	1310	60(4.8)
		Grade 'A'	980$	1030	1110	1280	170(15.3)	1345	65(5.1)
2	JOWAR	Hybrid	840	880	980	1500	520(53.1)	1500	.-
		Maldandi	860	900	1000	1520	520(52.0)	1520	.-
3	BAJRA		840	880	980	1175	195(19.9)	1250	75(6.4)
4	MAIZE		840	880	980	1175	195(19.9)	1310	135(11.5)
5	RAGI		915	965	1050	1500	450(42.8)	1500	.-
6	ARHAR (Tur)		2300	3000 ¶	3200 ¶	3850	650(20.3)	4300	450(11.7)
7	MOONG		2760	3170 ¶	3500 ¶	4400	900(25.7)	4500	100(2.3)
8	URAD		2520	2900 ¶	3300 ¶	4300	1000(30.3)	4300	.-
9	COTTON	Medium Staple	2500[a]	2500[a]	2800[a]	3600	800(28.6)	3700	100(2.8)
		Long Staple	3000[aa]	3000[aa]	3300[aa]	3900	600(18.2)	4000	100(2.6)
10	GROUND IN SHELL		2100	2300	2700	3700	1000(37.0)	4000	300(8.1)
11	SUNFLOWER SEED		2215	2350	2800	3700	900(32.1)	3700	.-
12	SOYABEEN	Black	1350	1400	1650	2200	550(33.3)	2500	300(13.6)
		Yellow	1390	1440	1690	2240	550(32.5)	2560	320(14.3)
13	SESAMUM		2850	2900	3400	4200	800(23.5)	4500	300(7.1)
14	NIGERSEED		2405	2450	2900	3500	600(20.7)	3500	.-
	RABI CROPS								
15	WHEAT		1100	1120 $	1285	1350	65(5.05)	1400	50(3.7)
16	BARLEY		750	780	980	980	0(0.00)	1100	120(12.2)
17	GRAM		1760	2100	2800	3000	200(7.14)	3100	100(3.3)
18	MASUR (LENTIL)		1870	2250	2800	2900	100(3.57)	2950	50(1.7)
19	RAPESEED/ MUSTARD		1830	1850	2500	3000	500(20.00)	3050	50(1.7)
20	SAFFLOWER		1680	1800	2500	2800	300(12.00)	3000	200(7.1)

21	TORIA		1735	1780	2425	2970	545(22.47)	3020	50(1.7)
	OTHER CROPS								
22	COPRA	Milling	4450	4450	4525	5100	575(12.7)	5250	150(2.94)
	(Calender Year)	Ball	4700	4700	4775	5650	575(12.0)	5500	150(2.80)
23	DE-HUSKED COCONUT (Calender Year)		1200	1200	1200	1400	200(16.7)	1425	25(1.79)
24	JUTE		1375	1575	1675	2200	525 (31.3)	2300	100(4.55)
25	SUGARCANE*		129.84	139.12	145.00	170	25(17.2)	210.00	40(23.5)
#	Figures in brackets indicate percentage increase								
$	An additional incentive bonus of Rs. 50 per quintal was payable over the Minimum Support Price (MSP)								
*	Staple Length (mm) of 24.5 - 25.5 and Micronaire value of 4.3 - 5.1								
aa	Staple length (mm) of 29.5 - 30.5 and Micronaire value of 3.5 - 4.3								
¶	Additional incentive at the rate of Rs. 500 per quintal of tur, urad and moong sold to procurement agencies was payable duirng the harvest/arrival period of two months.								
*	Fair and remunerative price								

Annex F: **New Series of CPI-All India Weights**

New series of CPI - All India Weights

Sub group/group	**Rural**	**Urban**	**Combined (Rural + Urban)**
Cereals and products	19.08	8.73	14.59
Pulses and products	3.25	1.87	2.65
Milk and milk products	8.59	6.61	7.73
Oils and fats	4,67	2.89	3.90
Egg, fish and meat	3.38	2.26	2.89
Vegetables	6.57	3.96	5.44
Fruits	1.90	1.88	1.89
Sugar etc	2.41	1.26	1.91
Condiments and spices	2.13	1.16	1.71
Non-alcoholic beverages	2.04	2.02	2.03
Prepared meals etc	2.57	3.17	2.83
Pan, tobacco and Intoxicants	2.73	1.35	2.13
Food, beverages and tobacco	59.31	37.15	49.71
Fuel and Light	10.42	8.40	9.49
Clothing and bedding	4.60	3.34	4.05
Footwear	0.77	0.57	0.68
Clothing, Bedding and footwear	5.36	3.91	4.73
Housing		22.53	9.77
Education	2.71	4.18	3.35
Medical care	6.72	4.34	5.69
Recreation and amusement	1.00	1.99	1.43
Transport and communication	5.83	9.84	7.57
Personal care and effects	3.05	2.74	2.92
Household requisites	4.48	3.92	4.30
others	1.12	0.99	1.06
Miscellaneous	24.91	28.00	26.31
All Groups	100.00	100.00	100.00

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ICRIER's Board of Governors includes leading academicians, policymakers, and representatives from the private sector. Dr. Isher Ahluwalia is ICRIER's chairperson. Dr. Rajat Kathuria is Director and Chief Executive.

ICRIER conducts thematic research in the following seven thrust areas:

- Macro-economic Management in an Open Economy
- Trade, Openness, Restructuring and Competitiveness
- Financial Sector Liberalisation and Regulation
- WTO-related Issues
- Regional Economic Co-operation with Focus on South Asia
- Strategic Aspects of India's International Economic Relations
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To effectively disseminate research findings, ICRIER organises workshops, seminars and conferences to bring together academicians, policymakers, representatives from industry and media to create a more informed understanding on issues of major policy interest. ICRIER routinely invites distinguished scholars and policymakers from around the world to deliver public lectures and give seminars on economic themes of interest to contemporary India.