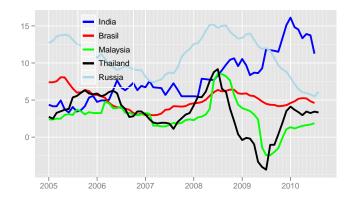
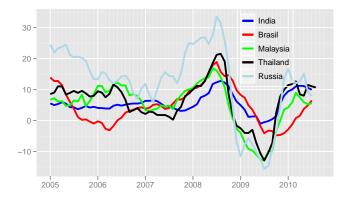
## Is India's inflation a serious problem?

Ila Patnaik, Ajay Shah, Giovanni Veronese

NIPFP Macroeconomics Symposium 14th Sept. 2010

- 1 Is India different?
- 2 Current trends
- 3 Measurement
- 4 Policy implications
- 5 Conclusions





# The recent experience

#### Inflation in India

- A hot political problem: recent bandh, social unrest
- A policy problem, in search for a culprit
  - monetary policy: lack of committment/clarity on target
  - agricultural policy: backwardness of sector, mismanagement of stocks
  - fiscal policy: impact from fiscal profligacy during electoral cycle

## Going forward

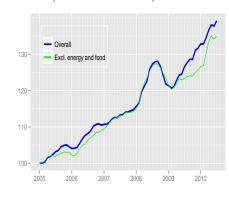
- What do the most recent trends show?
- 2 Measurement adds uncertainty: but can we unravel some patterns?
- B Is the institutional framework conducive to a return to normal inflation?

- 2 Current trends
  - WPI
  - CPI
  - What about services prices?
  - Expectations
- - Multiple (weak) indicators
  - Which target population?
  - Outdated expenditure baskets
  - A look into food
- - A temporary phenomenon?

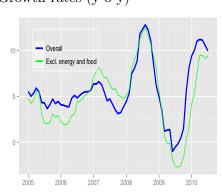
  - Investing in the statistical infrastructure

# WPI: overall and excluding energy and food

#### Levels (Jan. 2005=100)



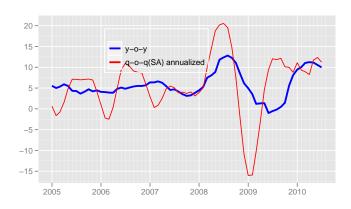
### Growth rates (y-o-y)



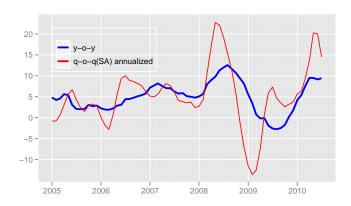
## Investigate shorter run dynamics

- From the graph of the levels: there is little or no seasonality
- y-o-y is probably too much. We are lagging the signal
- We can look at shorter run dynamics, e.g. growth of Jan-Mar. 2010 over Oct-Dec. 2009
- q-o-q growth rate at an annual rate (in scale with y-o-y) leads by approx 1.5 quarters the y-o-y

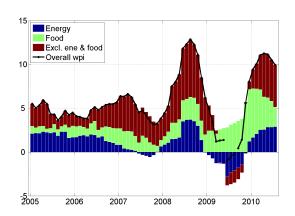
## WPI short run dynamics: q-o-q at an annual rate



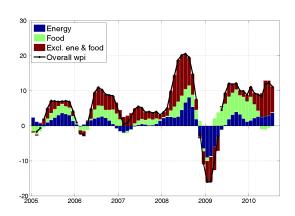
## Excl. energy and food: q-o-q at an annual rate



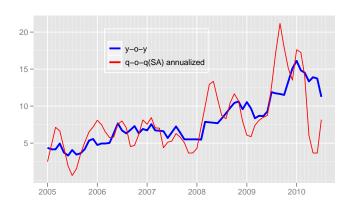
## The (yoy) story behind these WPI numbers



## Shorter run story behind the same WPI numbers

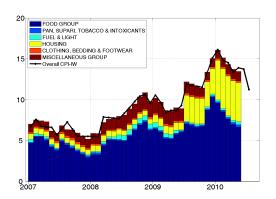


### CPI: industrial workers



## The yoy story behind the CPI numbers

#### Using the officialy available breakdown



Not only food, but also housing:  $(VI^{th} \text{ Pay Commission})$ 

What about services prices?

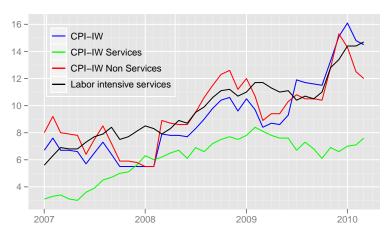
## No high freq data on wages, or on services

But, using the elementary item breakdown of the CPI-IW:

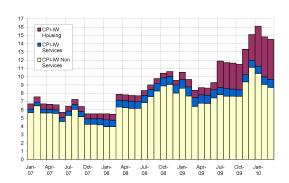
Description	Weight
Communication Services	1.04
Labor intensive Services	4.17
Health Services	0.87
Education	3.01
Leisure Services	0.71
Transport Services	2.52
ESI contribution	0.52
Overall Services	12.84

## The yoy of CPI-IW

#### Using a more interesting breakdown:

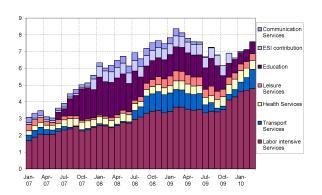


## The yoy story behind the CPI numbers



Not only food, but also housing, services weight is small.

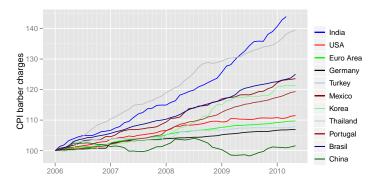
### Focus on services in CPI-IW



Labor intensive services are the key driver of this subgroup.

#### Labor intensive services

Barber prices: good proxy for wage dynamics in the informal economy?



Do they respond to food developments? What is the a link?

Expectations

#### Little information on $\pi$ expectations

- $\pi$  linked bonds allow to infer  $\pi^e = RY_{nominal} RY_{real}$  not available in India.
- Consensus Forecasts: long history and many questions
- RBI survey of professional forecasters (micro data not available)
- Survey data: RBI first released survey of inflation expectations among consumer in April 2010
  Very high inflation expectations numbers

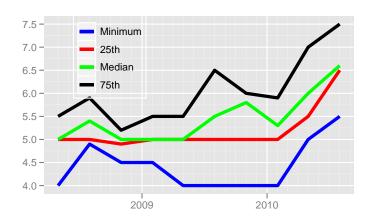
### Consensus Forecasts

Look at inflation expected, in april of each year, for the **next** fiscal year. It is a fully out of sample forecast, no impact from today's observed level of  $P_t$ 

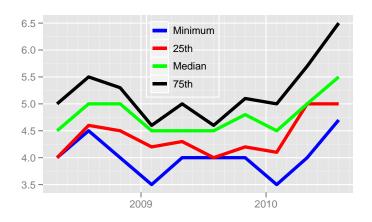
		CPI-IW			CPI-IW WPI			
survey in	Reference year	Mean	High	Low	Mean	High	Low	
Apr-00	2001/02	6.2	8.0	4.4	6.0	8.0	4.8	
Apr-01	2002/03	4.9	5.9	3.7	5.5	7.0	4.2	
Apr-02	2003/04	4.6	6.5	2.5	4.1	5.5	2.0	
Apr-03	2004/05	5.0	6.2	3.0	4.7	6.0	3.6	
Apr-04	2005/06	4.6	5.5	3.5	4.9	6.5	3.7	
Apr-05	2006/07	5.0	5.5	4.5	5.6	6.0	5.0	
Apr-06	2007/08	4.6	5.5	4.2	5.1	5.6	4.8	
Apr-07	2008/09	5.4	8.5	4.3	4.9	6.1	4.0	
Apr-08	2009/10	5.4	6.9	4.5	4.6	6.0	3.5	
Apr-09	2010/11	5.2	6.6	3.9	4.7	6.0	2.8	
Apr-10	2011/12	6.1	8.0	4.5	5.6	7.3	4.0	

Expectations

### SPF from RBI: 10 years ahead CPI inflation



# SPF from RBI: 10 years ahead WPI inflation



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- 5 Conclusions

Multiple (weak) indicators

### Inflation indicators

#### Many indicators in every country

Distribution stage	India	USA	$\mathbf{U}\mathbf{K}$	Italy
Importer	na	Import price index	PPI-imp	PPI-imp
Exporter	na	Export price index	PPI-exp	PPI-exp
Producer	na	PPI	PPI	CPI-NIC
Wholesaler	WPI	na	na	na
	CPI-IW	CPI-W	RPI	CPI-FOI
Retailer	CPI-AL	CPI-U	CPI	HICP
	CPI-RW	C-CPI-U		
Deflator	PCEPI	PCEPI	PCEPI	PCEPI

India actually lacks some

## The price indices in India: a comparison

	CPI-IW	CPI-AW	CPI-RW	CPI- UNME	WPI
Source	Bureau of Labor	Bureau of Labor	Bureau of Labor	Central Statistical Office	Ministry of Commerce and Industry
Base	2001=100	1986/87=100	1986/87=100	1984/85=10 0	1993/94=100
Data collection	monthly and weekly	monthly and weekly	monthly and weekly	monthly and weekly	monthly and weekly (food)
Frequency of published data	monthly	monthly	monthly	monthly	monthly and weekly (food)
Publication delay (weeks)	4	3	3	2	2
# elementary items	310	260	260	146-345	435/1918
% food products	48.5	69.15	66.77	45.67	26.9
% energy	7.43	8.35	7.9	5.5	14.2
% services	12.18	7.04	7.09	NA	0
Target population	70% non agric. workers	agricultural workers	rural workers	urban non manual employees	Gross output value and market surplus ratio
Underlying consumer survey	Working Class Family Income and Expenditure Survey 1999/2000	National Sample Survey Organisation 1983	National Sample Survey Organisation 1983	Middle class family living survey 1982/83	IIP and agriculture production survey
Geographical coverage and data collection	78 urban centers	600 rural villages	600 rural villages	59 urban centers	Centralized collection

Well known issue among policy makers and applied economists:

- poverty line estimation: Deaton and Tarozzi (2006)
- monetary policy: unlike in other countries disregard CPIs and rather focus on WPI

#### Lacunae related to:

- target population
- distribution of weights
- prices

## whose prices?

- Difficult to address aggregation into an All-India CPI from existing indices (hope lies in the future)
- current WPI is far from being easily referred to a well defined population: new one being released. Will see.

# The WPI, 1993/94=100

Primary Food Article	15.40
Non-Food Articles	6.10
Minerals	0.50
Food manufactured products	11.50
Beverages, Tobacco and Tobbaco products	1.30
Textiles	9.80
Wood and wood products	0.20
Paper and paper products	2.00
Leather and Leather products	1.00
Rubber and Plastic products	2.40
Chemicals and Chemical products	11.90
Non-metallic mineral products	2.50
Basic metals alloys and metal products	8.30
Machinery and Machinery tools	8.40
Transport, equipment and parts	4.30
Fuel, power and lubricant products	14.20
Food	26.90
Energy	14.20
Excluding food and energy	58.80

Since then dramatic changes occurred in the economy Not clear how weights were derived, and how to interpret them

## towards a new WPI index: 2004/05=100

	weights: 2004-05	weights: 1993-94
I. Primary articles	20.1	22.0
(A) Food Articles	14.3	15.4
(B) Non-Food Articles	4.3	6.1
(C) Minerals	1.5	0.5
II. Fuel & power	14.9	14.2
(A) Coal	2.1	1.8
(B) Mineral Oils	9.4	7.0
(C) Electricity	3.5	5.5
III. Manufactured products	65.0	63.7
(A) Food Products	10.0	11.5
(B) Beverages, Tobacco	1.8	1.3
(C) Textiles	7.3	9.8
(D) Wood & Wood Products	0.6	0.2
(E) Paper & Paper Products	2.0	2.0
(F) Leather & Leather Products	0.8	1.0
(G) Rubber & Plastic Products	3.0	2.4
(H) Chemicals & Chemical Products	12.0	11.9
(I) Non-Metallic Mineral Products	2.6	2.5
(J) Basic Metals, Alloys & Metal products	10.7	8.3
(K) Machinery & Machine Tools	8.9	8.4
(L) Transport, Equipment & Parts	5.2	4.3

- food weight in WPI, down to 24% from 26.9%
- but agriculture share in GDP  $\approx 15\%$ , from > 25% in 1993
- How should we then read the WPI?

## an aside on prices

- WPI prices are: a mixture of producer, wholesaler, MSP & PDS prices
- lack of clarity has relevant implications for policy analysis
- from producer to wholesaler the gap is mainly due to services (transport and distribution)

The concept of wholesale price adopted in practice represent the quoted price of bulk transaction generally at primary stage. The price pertaining to bulk transaction of agricultural commodities may be farm harvest prices, or prices at the village mandi /market of the Agricultural Marketing Produce Committee/ procurement prices, support prices. For manufactured goods the wholesale prices are administered prices, ex-factory gate/ ex-mill, ex-mine level. Ex-factory prices exclude rebate if any, other taxes and levies are excluded though excise duty is currently included.

(See OEA)

### The CPI-IW

Outdated expenditure baskets

- Among CPIs, CPI-IW has most recent weighting scheme
- 78 centres
- based on NSSO ad hoc survey in 1999/2000
- Target population: manual workers in manufacturing, but also plantations
- Imputed rents approach (as in US CPI)
- $\approx 12\%$  of the index are **services** (not counting rents)

See Report of the Index Review Committee, 2009

# Food weights

#### Expenditure shares according to NSSO rounds

NSSO round	43rd	50th	55th	61st	62nd	63rd
Rural population	1981/82	1986/87	1991/92	1996/97	2001/02	2006/07
cereals	26.1	23.8	22.2	17.4	17.0	16.5
gram	0.2	0.2	0.1	0.1	0.2	0.2
cereal substitutes	0.1	0.1	0.1	0.1	0.1	0.1
pulses & their products	4.0	3.7	3.8	3.0	3.2	3.3
milk & milk products	8.6	9.3	8.8	8.2	8.2	8.1
edible oil	5.0	4.4	3.7	4.4	4.1	3.9
egg, fish & meat	3.2	3.3	3.3	3.2	3.9	3.5
vegetables	5.2	5.9	6.2	5.9	6.1	6.2
fruits & nuts	1.6	1.7	1.7	1.8	1.9	1.8
sugar	2.9	3.0	2.4	2.3	2.4	2.0
salt & spices	2.9	2.6	3.0	2.4	2.1	2.3
beverages etc.	3.9	4.1	4.2	4.4	4.2	4.4
food total	63.8	62.1	59.4	53.1	53.3	52.3
pan,tobacco & intoxicants	3.2	3.1	2.9	2.6	2.5	2.5
fuel & light	7.4	7.2	7.5	9.8	9.7	9.5
clothing	6.7	7.4	6.8	6.7	6.3	6.1
footwea	1.0	1.0	1.1	1.0	1.0	0.9
misc. goods & services	14.4	16.8	19.6	23.0	23.7	24.9
durable goods	3.6	2.3	2.6	3.8	3.5	3.8
non-food total	36.2	37.9	40.6	46.9	46.7	47.7

NSSO round	43rd	50th	55th	61st	62nd	63rd
Urban population	1981/82	1986/87	1991/92	1996/97	2001/02	2006/07
cereals	14.8	13.8	12.3	9.6	9.4	9.1
gram	0.2	0.2	0.1	0.1	0.1	0.1
cereal substitutes	0.1	0.1	0.0	0.0	0.0	0.0
oulses & their products	3.4	3.0	2.8	2.0	2.2	2.3
milk & milk products	9.5	9.7	8.7	7.5	7.3	7.4
edible oil	5.3	4.3	3.1	3.3	3.0	2.9
egg, fish & meat	3.5	3.3	3.1	2.6	2.8	2.6
vegetables	5.2	5.4	5.1	4.2	4.2	4.3
ruits & nuts	2.5	2.6	2.4	2.1	2.2	2.1
sugar	2.3	2.3	1.6	1.4	1.5	1.3
salt & spices	2.3	2.0	2.2	1.6	1.5	1.6
beverages etc.	6.7	7.1	6.3	5.9	5.8	5.7
food total	55.9	53.9	48.1	40.5	40.0	39.4
pan,tobacco & intoxicants	2.6	2.3	1.9	1.5	1.5	1.4
fuel & light	6.7	6.5	7.8	9.5	9.4	8.9
clothing	6.0	7.0	6.1	5.6	5.4	5.4
lootwea	1.1	1.2	1.2	1.0	1.0	1.0
misc. goods & services	23.5	26.4	31.5	37.6	38.7	39.4
durable goods	4.2	2.6	3.6	4.3	4.0	4.5
non-food total	44.1	40.4	E4 0	E0 E	co o	co.c

Still very large weight. Have things changed more recently? Look at CMIE pyramid dataset which provides evidence orthogonal to NSSO

A look into food

### Food in CPI-IW and CMIE household survey

CPI-IW	I	CMIE- S	Sep 2009, all India
Food	shares in food	shares in food	Label
Cereals & Pulses	29.4	29.2	Cereals & Pulses
Edible Oils	7.3	7.0	Oils and Fats
Spices etc.	3.7	5.5	Condiments and spices
Potatoes & onions	5.8	1.56	Potato and onions
Vegetables & Fruits	14.4	13.1	Vegetables and fruit
Milk	13.2	13.9	Milk various kinds
Milk Products	2.5	1.9	other milk products
Biscuit	1.3	1.02	Biscuit
Salty Snacks	1.1	1.65	Snack-Saltish
Noodles/flakes	0.4	0	NA
Confectionery	0.4	0.95	Snack-Sweet
Juices/jams	0.6	0.13	Cold drink/Aerated Water
Health supplements	0.8	0	NA
Meat/Eggs/Fish	8.1	8.6	Meat, Fish and Eggs
Ready to Eat Food	1.8	0	NA
Tea	2.3	6.2	Tea
Coffee	0.2	0.3	Coffee Powder
Sugar, Gur etc.	4.5	3.3	Sugar and Gur
Beverages (Soft drinks)	0.6	0.1	Green Coconut
Bottled Water	0.1	0.13	Cold drink/Aerated Water
Other food	1.4	1.73	Other food

Not too dissimilar distribution within food categories, but substitution may have occurred at

## looking elsewhere for food prices

We investigate developments in top "inflation culprits", using data from multiple sources:

- Ministry of Agriculture prices (retail and wholesale). The latter underlie WPL
- NCDEX commodity prices
- Labour Bureau (LB): price level data underlying the CPI-IW
- MSP prices

Intensive cleaning of the raw data of the price levels needed to obtain "reasonable" price series

# Findings

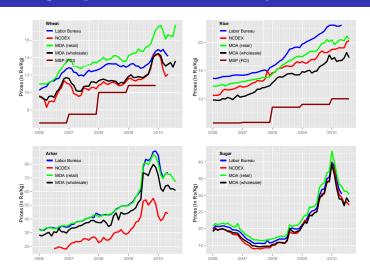
- Substantial geographical heterogeneity in price levels
- Some discrepancies in price levels across sources
- Problems of non response, outliers in MoA and LB data: needs to be addressed
- NCDEX provides high quality leading information on agricultural prices

#### Also,

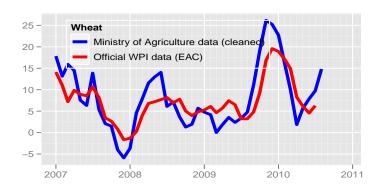
- Compare official dynamics in WPI and CPI for these items
- Investigate behavior of retail-producer margins

A look into food

## Looking at price levels from many sources

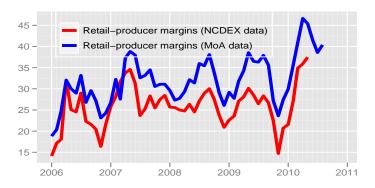


## Wheat price dynamics WPI vs MoA, y-o-y growth



- WPI lags the NCDEX "wholesale" price series
- Difference in levels and volatility

# Evidence of hoarders/speculators



Margins=  $100*(\frac{Price_{consumer}}{Price_{producer}}-1)$  What series you use matters, but no evidence of an "abnormal" behavior

- - CPI
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A temporary phenomenon?

# From RBI Macroeconomic and Monetary Developments, Oct. 26 2009

Sustained high CPI and essential commodities inflation could pose a challenge to the Reserve Bank's objective of firmly anchoring inflation expectations.

the WPI inflation in India has shown significant firming up in recent months, with the pressure though coming from primary articles and manufactured food products. The dominance of food prices as the key driver of inflation in recent months indicates a limited role for demand management in effectively curbing the price pressures. Persistence of food price inflation could erode the purchasing power of the public who may be compelled to devote larger share of their disposable income to food consumption. Moreover, high food inflation and elevated CPI inflation could potentially generate wage-price **spiral** and raise inflationary expectations.

## RBI IV IIIrd Quarter Review, Apr. 19 2010

Alongside increasing generalisation of the inflation process, demand side pressures from certain quarters also became visible. Consumer price inflation moderated in February 2010 although it still remains high in double digits. With recovery in growth gaining momentum, the Reserve Banks' policy emphasis has shifted to anchoring inflation expectations.

Given inflation persistence, high generalised inflation, if not contained, could aggravate inflation expectations and impede the ongoing recovery.

A temporary phenomenon?

# From RBI Macroeconomic and Monetary Developments, Jul 26, 2010

Wage revisions to offset the impact of inflation on purchasing power, and use of higher mark ups with return of pricing power of firms, could strengthen the interactions between inflation expectations and actual inflation. This suggests a need to continue the process of normalisation of monetary policy to anchor inflation expectations.

#### The current monetary policy framework:

- time varying weights attached to  $\pi$ , ygap, financial stability, etc
- lacks clarity on what inflation rate is perceived as desirable
- need to settle on what indicator (or combination of indicators) to look at. This choice cannot be state dependent.
- being fuzzy about it only makes non transparent the inevitable economic and distributional costs of policy making

Our committeent in this regard is clearly defined in our own policy documents where we say our objective is to 'contain perception of inflation in the range of 4.0 to 4.5 per cent in line with the medium-term objective of 3.0 per cent inflation consistent with India's broader integration with the global economy'. from Subbarao (26 April 2010)

On balance, keeping in view domestic demand-supply balance and the global trend in commodity prices, the baseline projection for WPI inflation for March 2011 is placed at 5.5 per cent. ... We expect four major outcomes from the above policy action: i) Inflation will be contained and inflationary expectations will be anchored.... from RBI Annual policy statement for the year 2010-11, press statement 20 April 2010

## core vs non core items

CB may want to exclude certain items from the inflation index:

- volatility (Cecchetti, Blinder etc)
- rigidities and distortions (Aoki, Woodford)

However CB should be careful in disregarding them:

- with credit constrained households (Prasad et al.)
- indexation of wages and contracts
- second round effects

## Wages and food price inflation

#### A first look into the food-wages nexus



Response to Cholesky One S.D. Innovations  $\pm 2$  S.E.

# The future looks brighter: we are hopeful

- New WPI: 2004/05 will be released today
- New CPI: sometimes soon
- More coordinated effort by the statistical agencies

- Inflation is a problem
  - $\blacksquare$  measurement: statistical deficiencies complicate the analysis
  - Similar issues arise in measuring economic activity (next paper)
- policy: monetary policy needs refocusing
- How can we anchor expectations if no agreement on what inflation is?