



India's Non-Inflationary Rate of Growth: *Analytical Perspectives and Policy Implications*

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Structure of Presentation

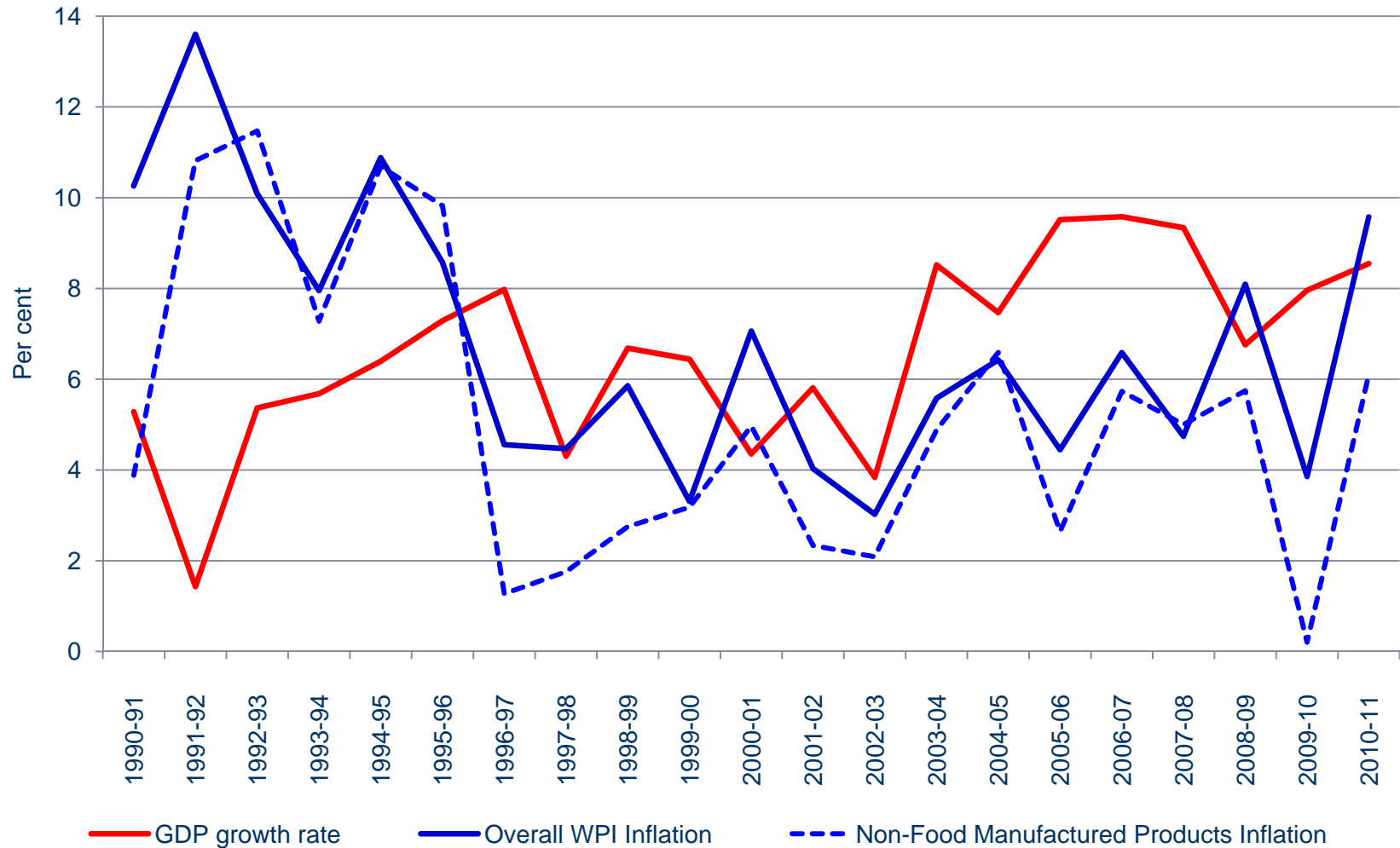
- ◆ Context
- ◆ Estimates of potential growth
- ◆ Persistence of inflation and thresholds
- ◆ Towards analytics of NIRG
- ◆ Policy Implications
- ◆ Concluding thoughts



CONTEXT

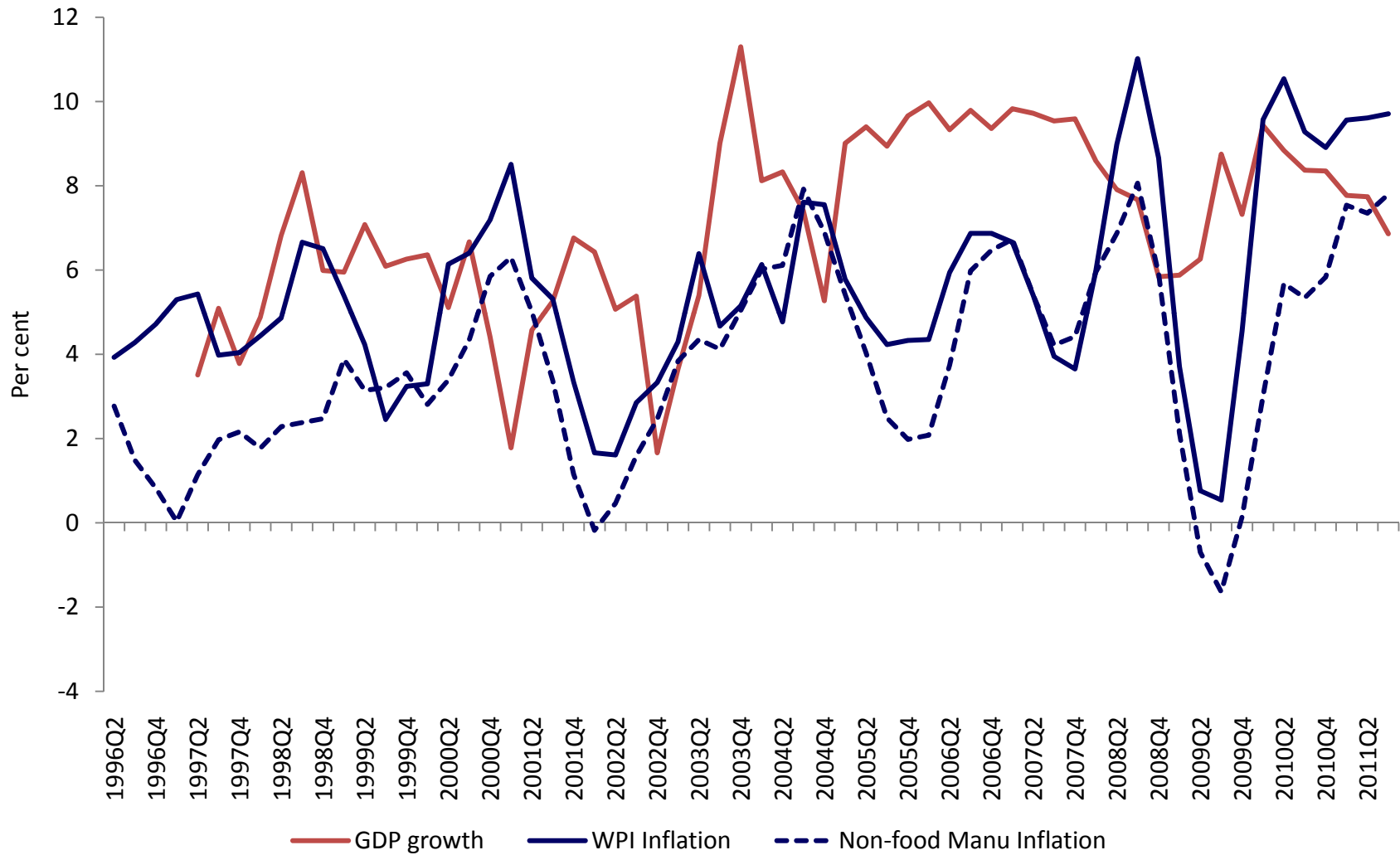


Growth and Inflation: A First Look





A Quarterly Perspective





Some Initial Observations

- ◆ Inflation has tended to accelerate when growth does and decelerate when growth does
 - *Both WPI and NFMP rates follow this pattern*
- ◆ But, growth threshold has changed
 - *7% in the mid-1990s, 8.5% in the early 2000s*
- ◆ Leads and lags are not uniform
 - *Many other factors are also at work over the period*



The Policy Context

- ◆ NIRG is a critical anchor for monetary policy
- ◆ A robust estimate can help effective timing and magnitude of policy actions
- ◆ Growth sacrifice can be communicated more clearly
- ◆ Variability of NIRG makes policy decisions more challenging



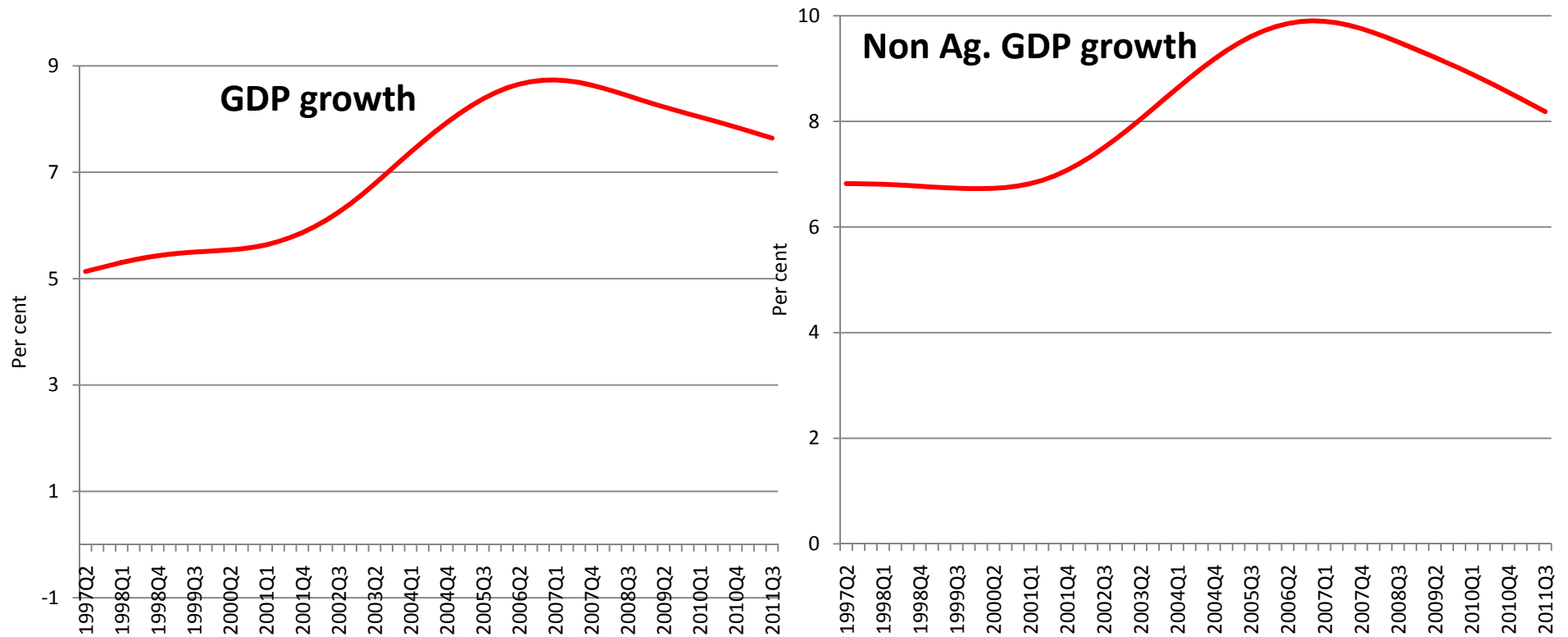
ESTIMATES OF POTENTIAL GROWTH



Potential Output Growth

Conventional Hodrick-Prescott Filter Approach

Potential GDP Growth Rate





Variance across Estimates

Study	Year	Potential Growth
Donde & Saggar	1999	6.3 per cent
Dhal, S	1999	6.5 & 8-10 per cent
Rodrik & Subramanian	2004	7 per cent (2 decades)
Bosworth-Collins	2006	8-8.4 per cent
Ranjan et al	2007	6.6-8.0 per cent
Hiroko Oura	2007	7.4-8.1 per cent
RBI	2010	8.0 per cent
Bardoloi et al	2011	8.1-9.5 per cent



Some Issues...

- ◆ Captures structural breaks
- ◆ Some consonance with the raw impressions on growth and inflation dynamics

BUT

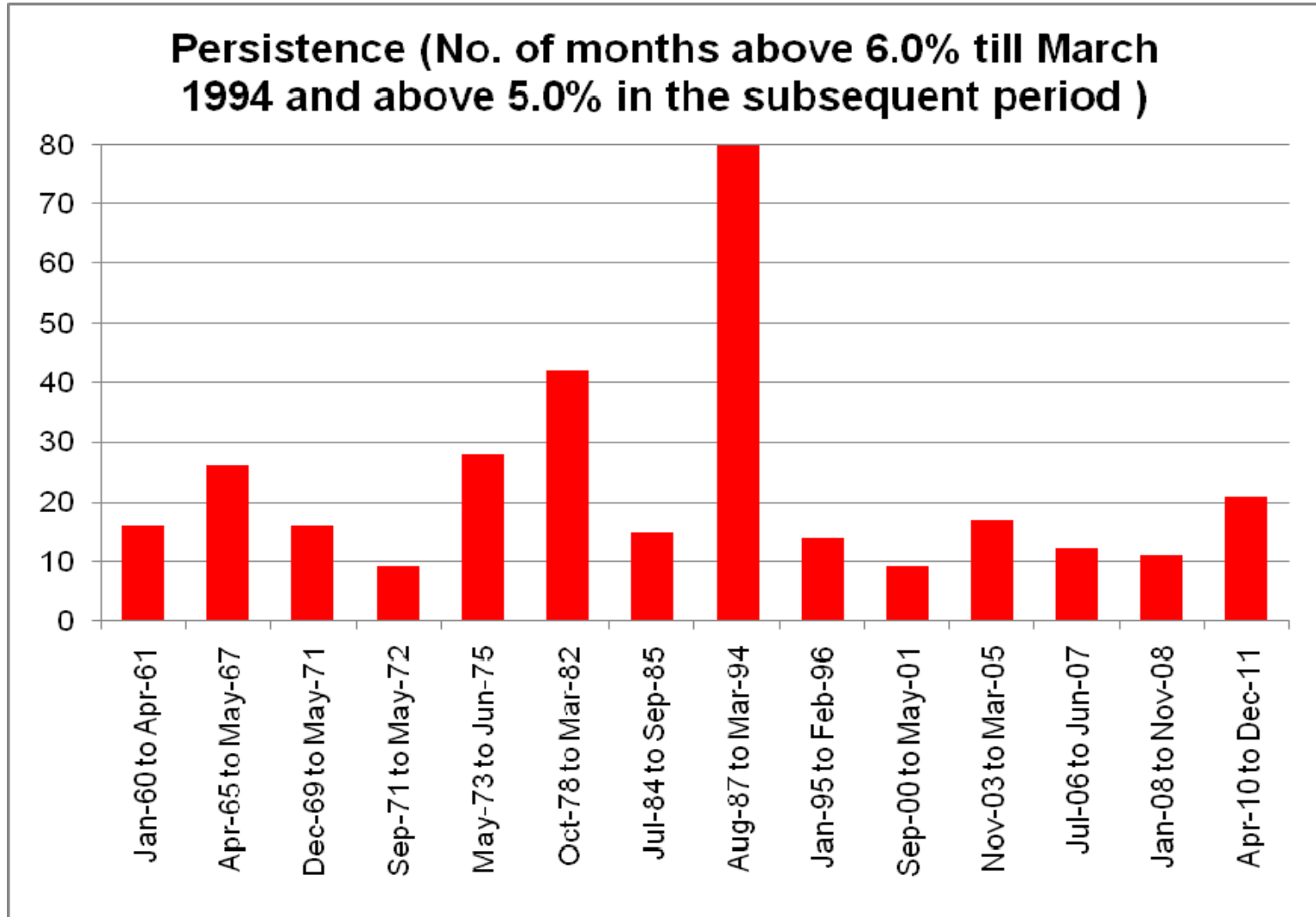
- ◆ Very sensitive to estimation technique
- ◆ **Inflation dynamics are not explicitly integrated**



PERSISTENCE OF INFLATION AND THRESHOLDS

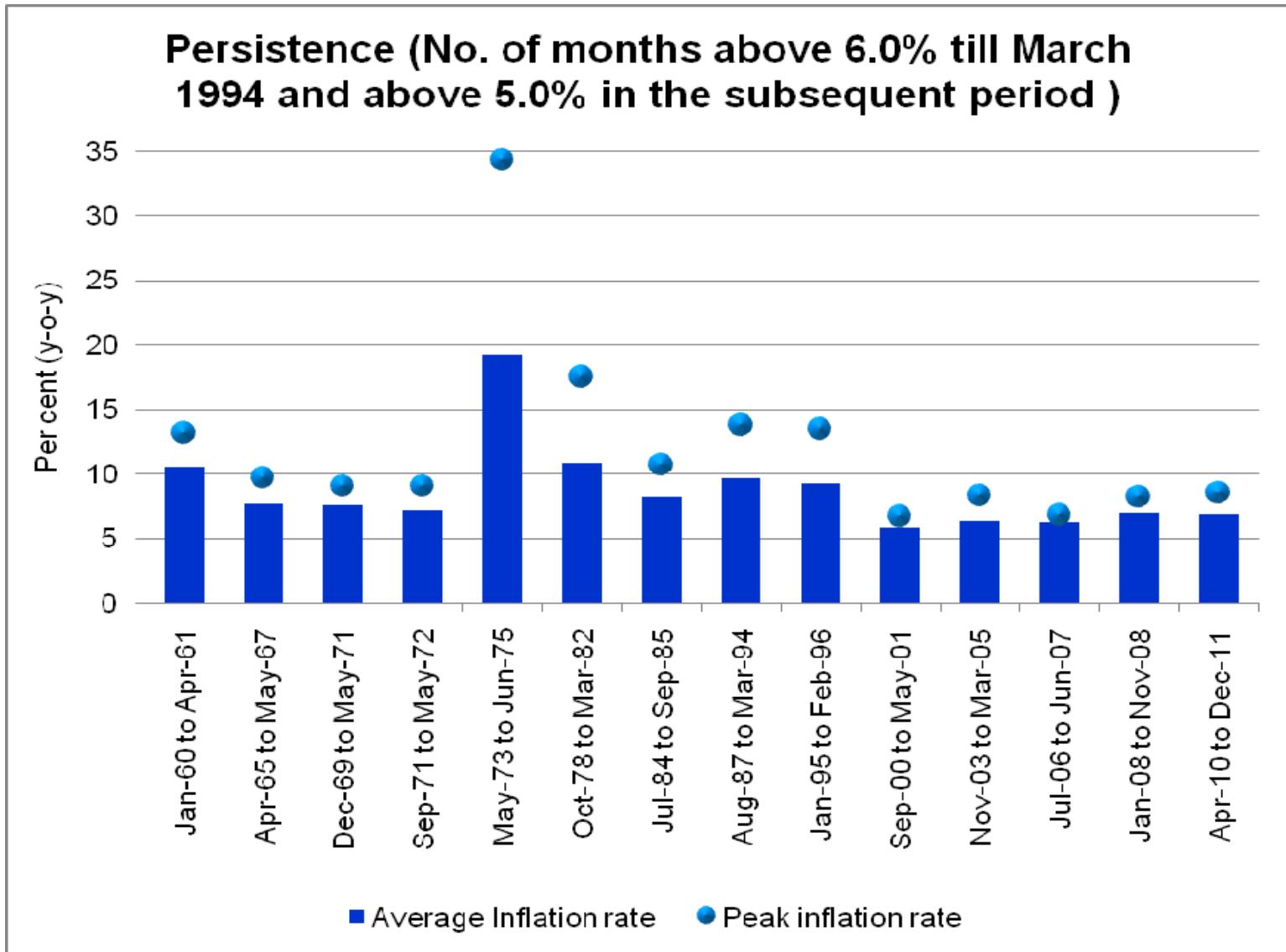


Persistence of Non-food Manuf. Inflation..1





Persistence of Non-food Manuf. Inflation..2





Estimates of Threshold Inflation

Study	Period	Threshold Inflation (%)
Rangarajan (1998)		6.0
Kannan and Joshi (1998)	1981-96	6.0-7.0
Vasudevan, Bhoi and Dhal (1998)	1961-98	5.0-7.0
Samantaraya and Prasad (2001)	1970-99	6.5
RBI, Report on Currency and Finance (2001)	1970-2000	5.0
Singh and Kalirajan (2003)	1971-98	No Threshold
Bhanumurthy and Alex (2010)*	1975-2005	5.0 - 5.5
Singh, Prakash (2010)	1970-2009	6.0
RBI, Annual Report 2010-11		4.0-6.0
Pattanaik and Nadhanael (2011)		6.0
Mohanty, Chakraborty, Das and John (2011)	1996-2011**	4.0-5.5
IMF (2012)	1996-2011**	5.5-6.0

* In the monthly data over January 2000 to April 2007, they suggested 4 to 4.5 per cent as the threshold.

** Estimates based on quarterly data. Remaining studies are based on annual data.



Some Issues

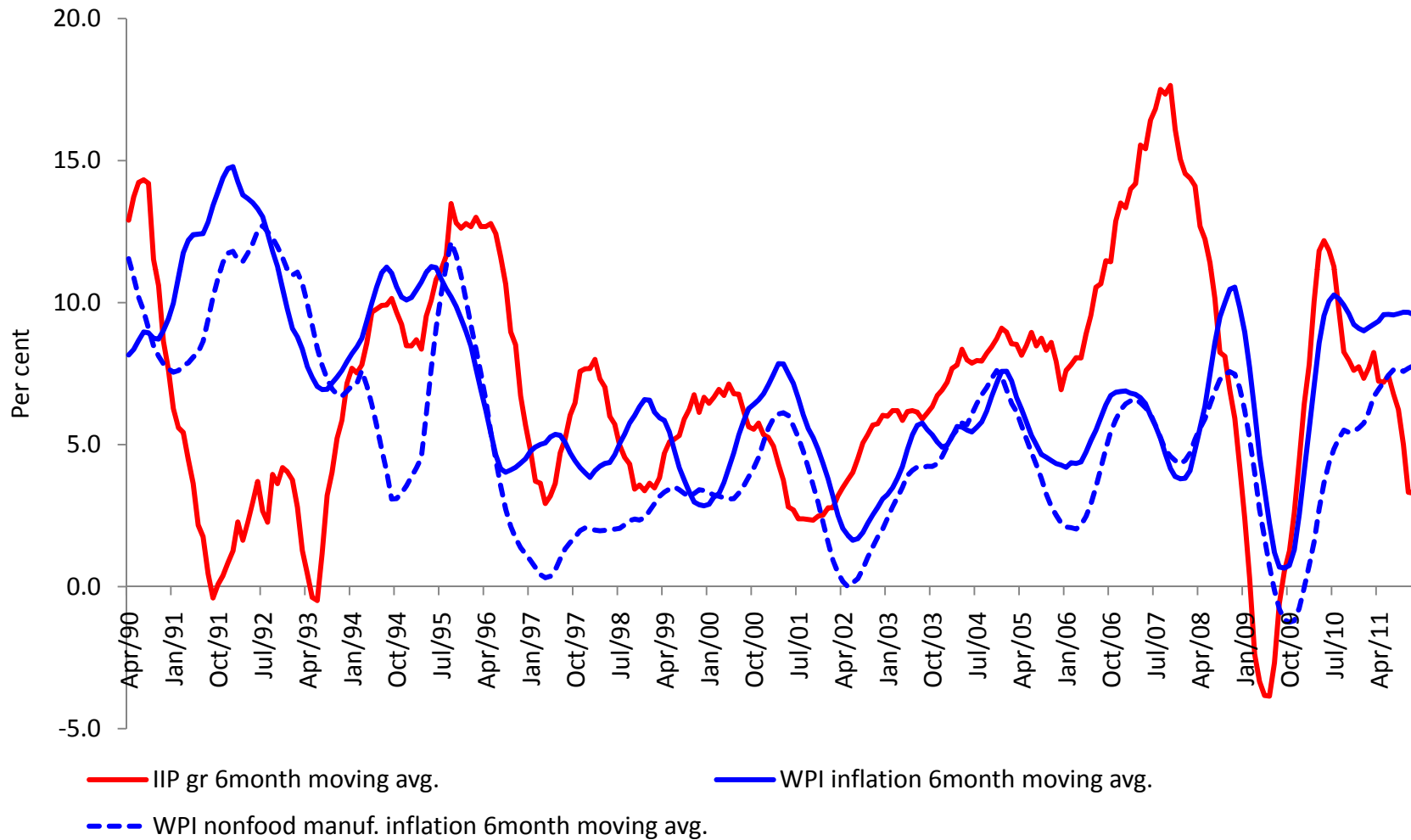
- ◆ Threshold estimates have been relatively stable over time
- ◆ More recent exercises cap it at 6%, but somewhat lower appears to be safer
- ◆ Most recent episode of persistence raises concerns
 - *Pricing power and behaviour*
 - *Expectations*



TOWARDS ANALYTICS OF NIRG

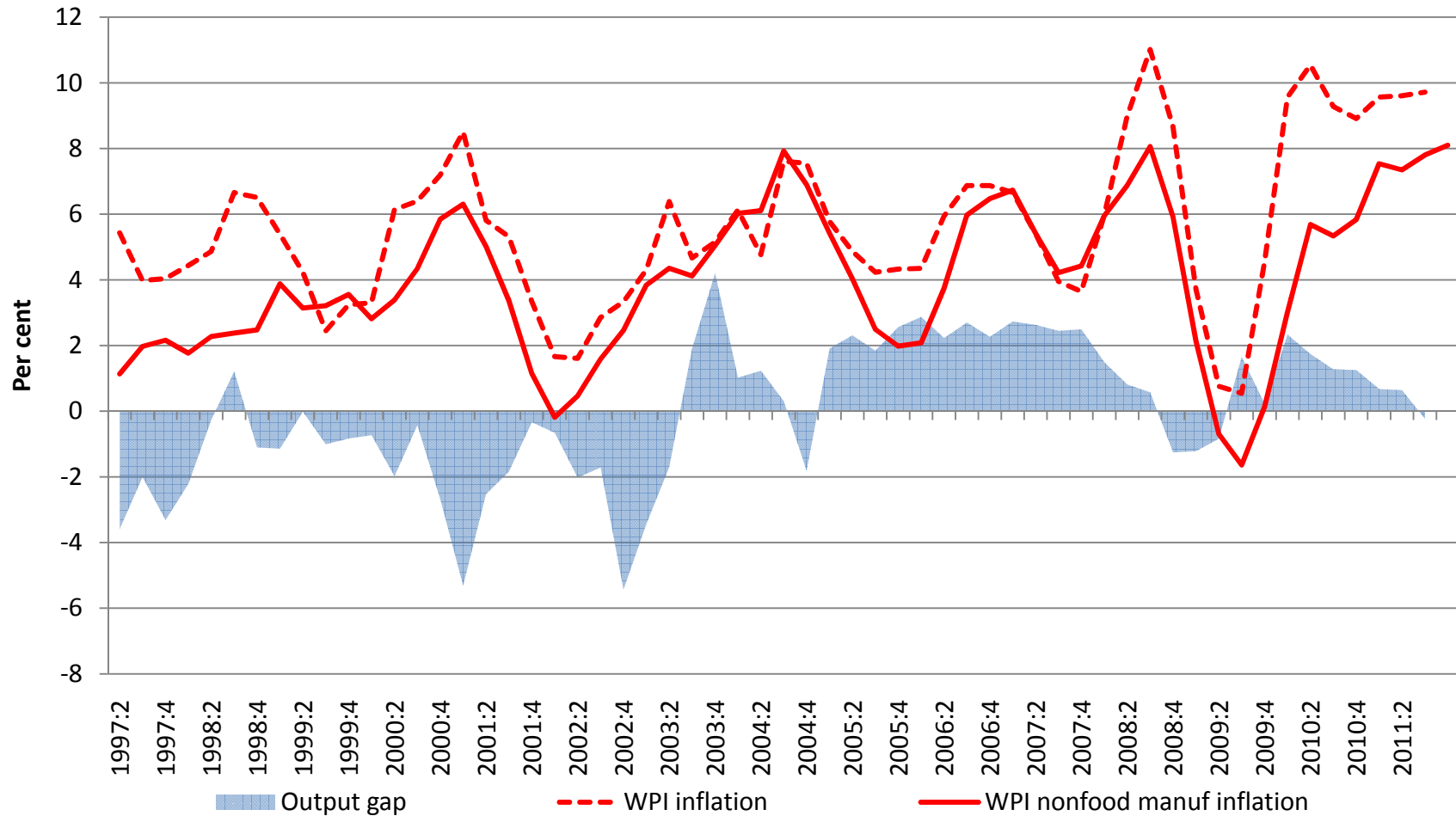


A “Smoother” Picture – Leads and Lags



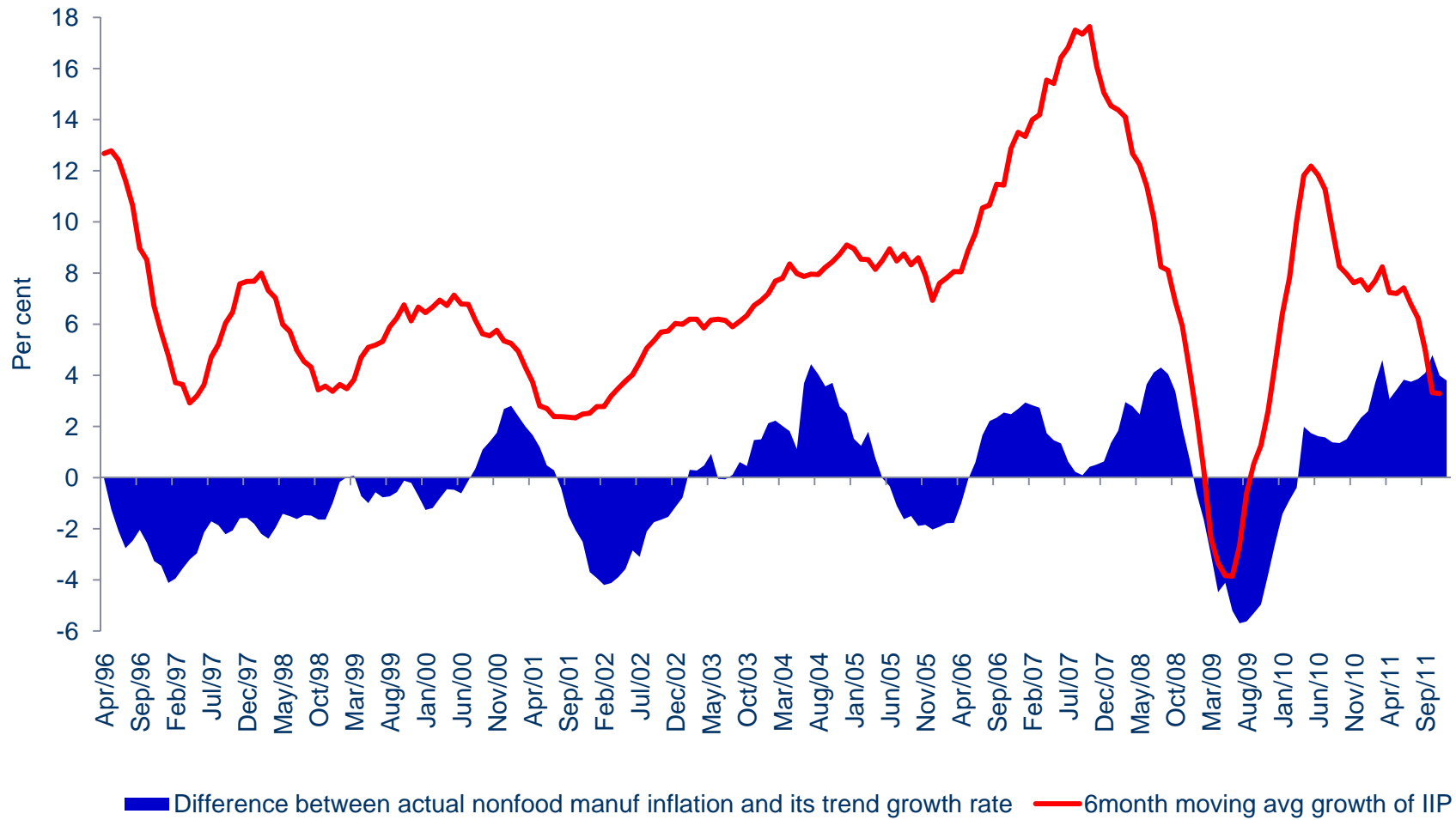


Output Gap and Inflation Acceleration



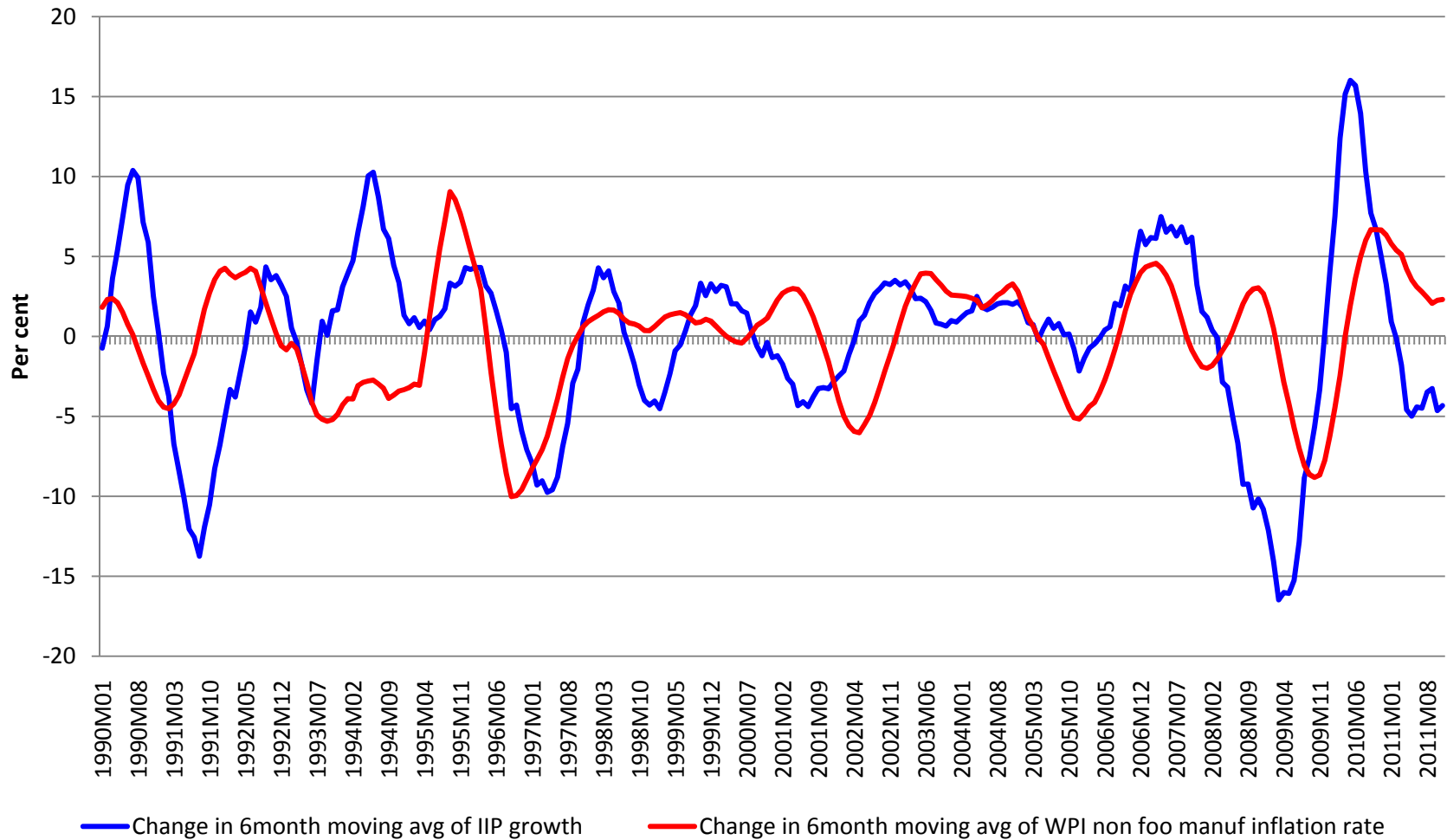


Growth Acceleration and Inflation Gap



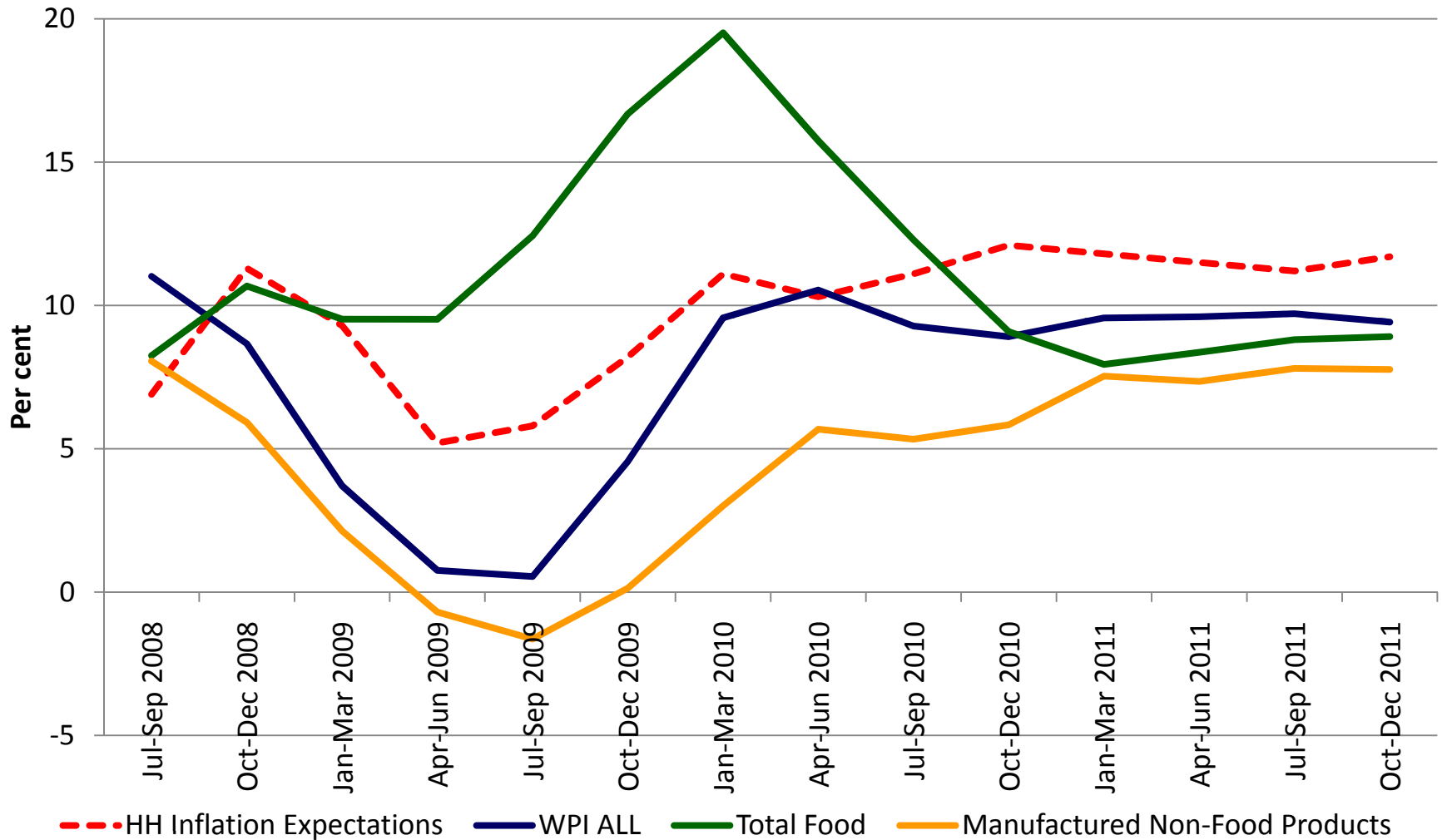


Acceleration in Inflation and Growth



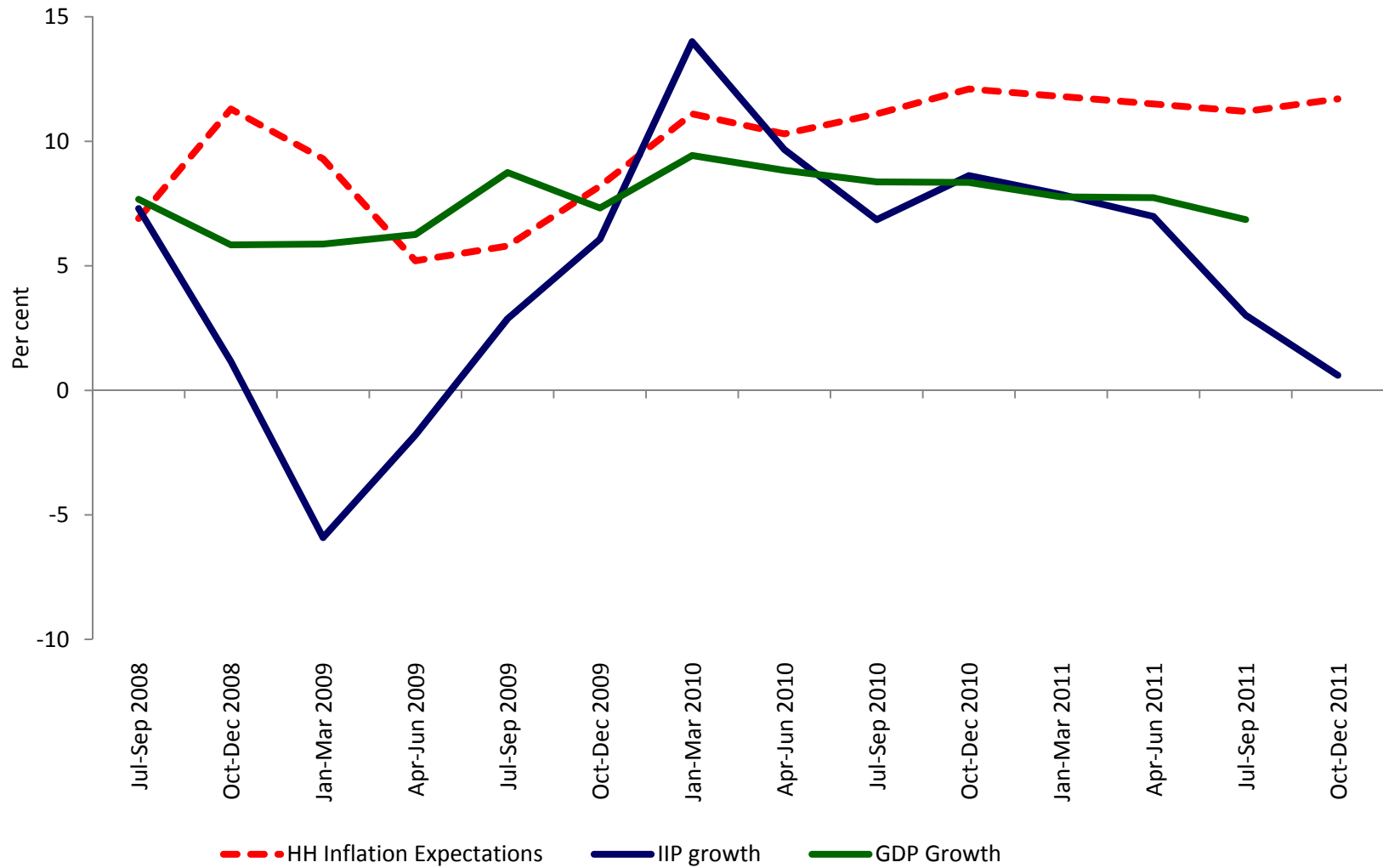


Inflation and Inflation Expectations





Growth and Inflation Expectations





Some Issues

- ◆ Gap analysis appears to validate the conventional growth-inflation lead-lag
- ◆ Acceleration analysis provides some sense of turning points
 - *Acceleration/deceleration in one is typically followed by same pattern in the other*
- ◆ However, lag structures are variable and sometimes inverted
- ◆ Expectations appear to be relatively invariant to changing inflation and growth dynamics
- ◆ Bi-variate analysis is clearly incomplete; other factors need to be explicitly considered



POLICY IMPLICATIONS



Policy Issues...1

- ◆ A reliable estimate of NIRG is necessary for minimizing the risk of policy errors
- ◆ A Taylor Rule approach, particularly, needs a reasonable estimate of output gap
- ◆ Even an Inflation Targeting approach would not ignore a wide negative output gap
- ◆ Persistence of inflation should induce re-examination of NIRG dynamics

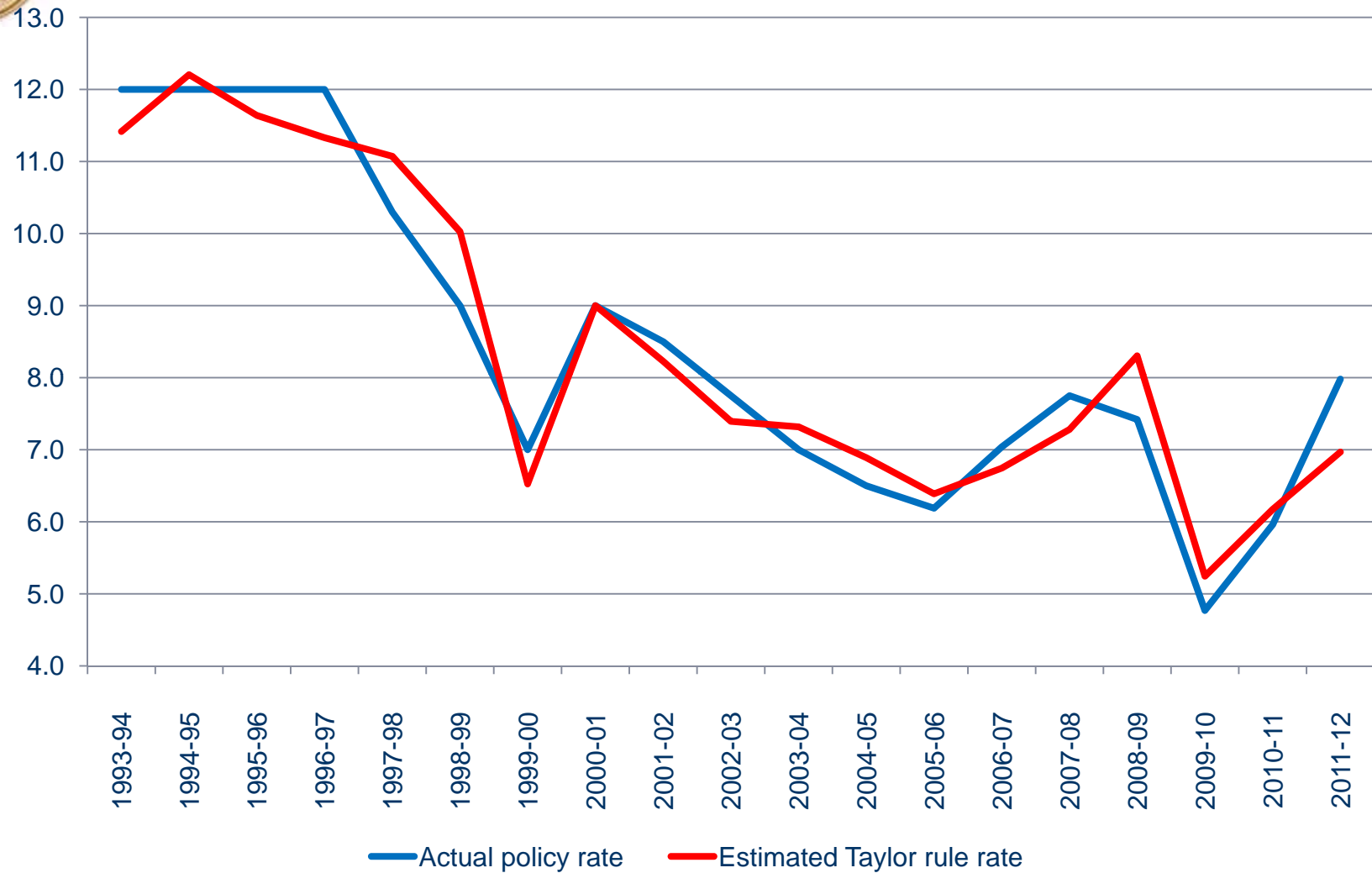


Policy Issues...2

- ◆ Evidence so far on invariance of inflation expectations to inflation and growth dynamics is important
 - *Alternative measures of expectations*
- ◆ Explicit consideration of other factors influencing NIRG and shaping growth-inflation dynamics
 - **Short run:** e.g., transitory food and commodity price shocks
 - **Long run:** e.g., capacity changes, persistent price pressures



Estimated Taylor Rule for India

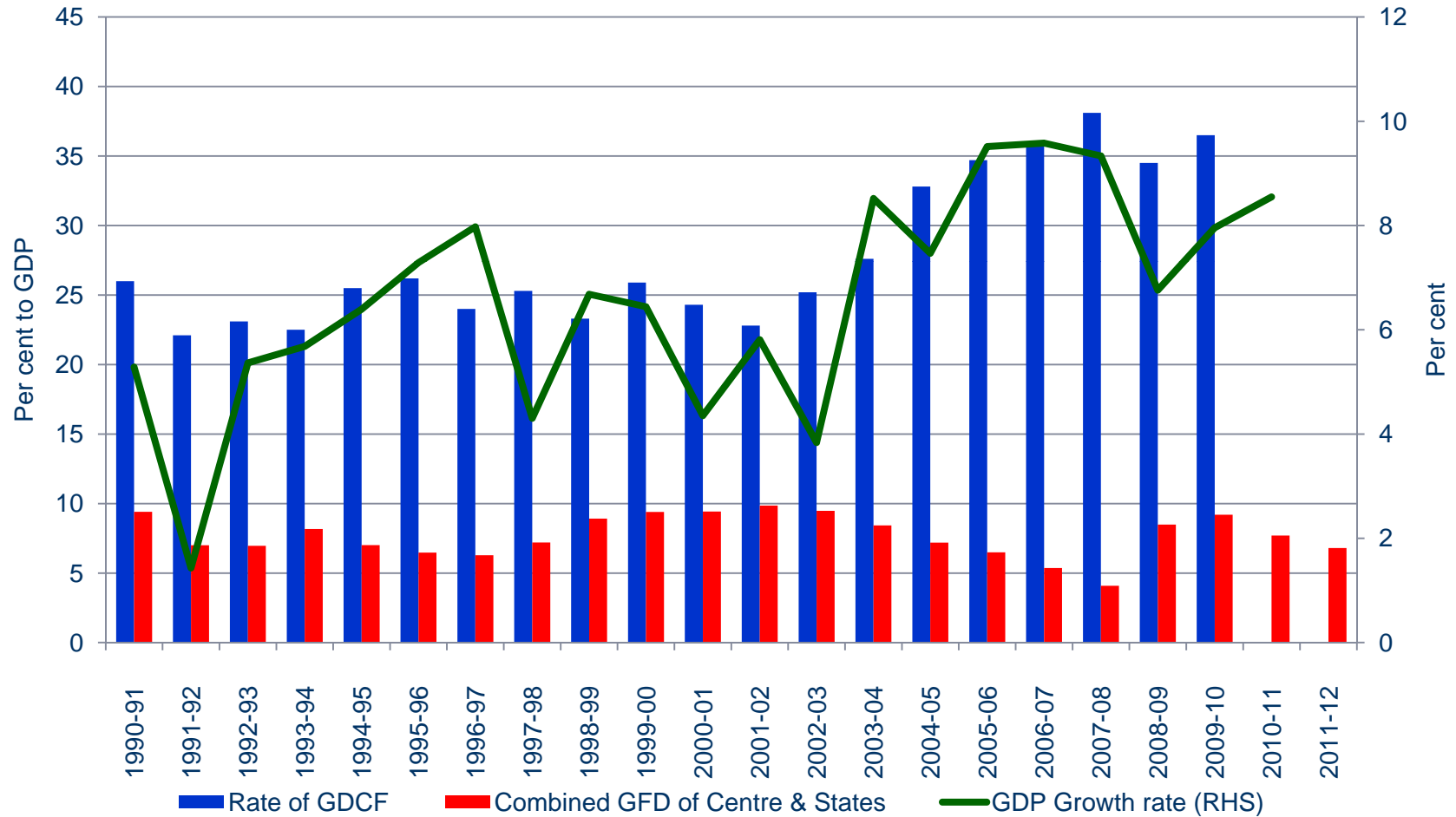


Estimated inflation and growth parameters are 1.00 and 0.76, respectively, based on the annual from 1993-94 to 2011-12. The growth and inflation assumption for 2011-12 are 7.0 per cent each. The policy rate series refer to bank rate and repo rate for the 1990s and 2000s, respectively.



Virtuous Cycle 2003-08

Rising Investment, Falling Deficits, Accelerating Growth



Source: GOI



CONCLUDING THOUGHTS

In Conclusion...

- ◆ Any rule-based approach to monetary policy must have a good estimate of NIRG
- ◆ Debate on whether policy is tight or loose revolves around this estimate
- ◆ Analytical challenges are significant
 - *Too simplistic or too complicated*
- ◆ Need to make the best use of whatever analytics are available
 - *Surveys, Consultations*