Indian Inflation 2008-2013 – What Happened?

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Oxus Investments

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High Inflation in India – Past and Future

This paper about the high inflation of the past:
Record high inflation in India for the last six years, 2008 to 2013. This has averaged 9.8% and nearly equal to the six-year average of 10.1 observed in 1975. Recall that the 1975 average was induced by a quadrupling of the price of oil in Oct. 1973.

And about impending future inflation: “There are consistent signs of inflation falling at a rate faster than that envisaged by the RBI. While 8 percent headline inflation is targeted for end-2014, all indications are that inflation will be below that level by May 2014.” Monthly GDP Report, Zyfin Research, Feb. 2014
What determines inflation in India?

Model of Inflation:

CPI inflation is primarily dependent on administered food prices. These are the minimum support prices administered by the government for 24 crops; most importantly wheat and rice.

Administered prices also explain high rural wages (not MNREGA!), and high rural land prices (not monetary policy!)

If trade is restricted, then output price movements dictate movement in factor costs involved in production;

Hence, administered prices for wheat, rice, etc., determine prices of fruits, vegetables, milk - not protein
Determinants of High CPI Inflation

• What has caused this high inflation:

  Is it the fiscal deficit – No.

  Is it “embedded” inflationary expectations? No

    (This begs the question of what causes inflationary expectations?)

  Is it excess agricultural or GDP growth? No

  It is government administered procurement prices; after rising at an average rate of 14 percent per year, 2007-2012, such prices increased by only 6 % in 2013

  These prices act with a 1 year lag; this is why inflation is set to decline regardless of monetary policy!

*Model predicts a 3.5 percentage point decline in CPI inflation in 2014*
Inflation (CPI) and its 5 year moving average
Inflation: India Vs Developing Countries

Median Inflation Developing Countries

India

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Inflation (CPI) and Fiscal Deficit of India

CPI Inflation

Fiscal Deficit % GDP

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Indian Inflation 2008-2013 – What Happened?
# RBI Inflation Expectations: Explained by What?

<table>
<thead>
<tr>
<th>Variable</th>
<th>Expected Inflation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual WPI</td>
<td>0.37***</td>
</tr>
<tr>
<td>Annual CPI</td>
<td>0.06</td>
</tr>
<tr>
<td>Quarter WPI (seasonally adjusted)</td>
<td>0.14*</td>
</tr>
<tr>
<td>Quarter CPI (seasonally adjusted)</td>
<td>-0.31***</td>
</tr>
</tbody>
</table>

| R²                                       | 0.29               |
|                                         | 0.31               |

| Number of Observations                   | 22                 |

* p<0.1; ** p<0.05; *** p<0.01
RBI expected Inflation and current WPI – Related till 2013
UPA social engineering: Terms of trade: Agriculture to Non-Agriculture Prices

Agriculture to Non-Agriculture, GDP data, 2004=100

% change
Relative Price Of Agriculture to Non-Agriculture, GDP data, 2004=100
Relative Price of Food: Up, Up and Away

Relative Prices (Indices, Base = 2004/05)

- RP - Agricultural: Non-Agricultural
- RP - Mfg Non-Food: WPI
CPI And Procurement Prices

Inflation : CPI

Inflation : Procurement Price, Lagged One Year
## Models of CPI inflation: Significance of Lagged Procurement Prices

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model (1)</th>
<th>Model (2)</th>
<th>Model (3)</th>
<th>Model (4)</th>
<th>Model (5)</th>
<th>Model (6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government Deficit</td>
<td>0.12</td>
<td>0.28</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Lagged Government Deficit</td>
<td>0.14</td>
<td>-0.23</td>
<td>0.02</td>
<td>-0.15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GDP Growth</td>
<td>0.08</td>
<td>0.26**</td>
<td>-0.17</td>
<td>-0.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lagged Index of Procurement Prices</td>
<td>0.33***</td>
<td>0.33***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median Inflation in Developing Countries</td>
<td></td>
<td></td>
<td>0.63***</td>
<td>0.56***</td>
<td>0.67***</td>
<td></td>
</tr>
<tr>
<td>Lagged Relative Price of Food</td>
<td></td>
<td></td>
<td></td>
<td>0.73***</td>
<td>0.74***</td>
<td></td>
</tr>
<tr>
<td>Lagged Rural Wages</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.07</td>
<td></td>
</tr>
<tr>
<td>R²</td>
<td>0.00</td>
<td>0.02</td>
<td>0.28</td>
<td>0.71</td>
<td>0.76</td>
<td>0.773</td>
</tr>
<tr>
<td>Number of observations</td>
<td>44</td>
<td>21</td>
<td>37</td>
<td>37</td>
<td>43</td>
<td>41</td>
</tr>
</tbody>
</table>

* p<0.1; ** p<0.05; *** p<0.01

Note: 1. Model 2 is for the period 1993-2013.

Actual and Forecast CPI inflation: Model 1
Actual and Forecast CPI inflation: Model 2

CPI

Predicted CPI


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## Agricultural Growth: Role of Rainfall

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rainfall Index (June - September)</td>
<td>11.02***</td>
</tr>
<tr>
<td>Lagged Rainfall Index (June - September)</td>
<td>-10.88***</td>
</tr>
<tr>
<td>Constant</td>
<td>2.62***</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.58</td>
</tr>
<tr>
<td>Number of observations</td>
<td>63</td>
</tr>
</tbody>
</table>

* p<0.1; ** p<0.05; *** p<0.01

Dependent Variable: Growth in Agricultural Output
Agricultural Growth explained by Rainfall, 1950-81
Agricultural Growth explained by Rainfall, 1983-2013
Impending Decline in Inflation: CPI and WPI: Monthly (saar) 2007-2014
Impending decline in Inflation: “Predicted” GDP Deflator
Thank You