Price Rigidity in Brazil: Evidence from Consumer Price Micro Data

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Outline

- Motivation
- Purpose
- Stylized facts about price setting mechanism
- Importance of menu costs
- Importance of indexation
- Conclusion
Motivation

Study inflation persistence in Brazil by evaluating the degree of price rigidity in the economy is a new line of research.

- Improve our knowledge about the transmission mechanism of monetary policy in Brazil.

Micro-founded macro models usually assume nominal price rigidity, but micro studies are scarce.

- Provide micro empirical evidence on the price setting mechanism in Brazil.
Derive stylized facts on the price setting mechanism for Brazil.

I. How often do prices change?
II. What share of prices is changed monthly?
III. Is the price setting mechanism heterogeneous?
IV. How do the size of prices increase compare to prices decrease?
V. Do prices increase more often than they decrease?
Size: 124.6 thousand time series of individual price quotes from CPI index, IPC - FGV.

Price quote of a product with very precise characteristics sold at a specific outlet.

Coverage: Around 85% of CPI index.

Time range: 10 years (1996 to 2006).
I. How often do prices change?

- Prices remain fixed, on average, for 2.7 and 3.8 months, depending on the method applied.
Distribution of Mean Duration of Price Spells

Percent of Total Frequency

Duration in Months

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

0 10 20 30 40 50

15.05% 41.75% 17.90% 2.43% 1.40% 3.85% 4.85% 4.37% 1.46% 2.43% 1.04% 0.49% 0.49% 0.97% 0.49% 0.49%
II. What share of prices is changed monthly?

- 37% of prices change monthly.
  - For US: 26.1%
  - For Euro area: 15.3%
- Results suggest prices are more flexible in Brazil.
• How did the share of prices adjusted each month change over time?

Monthly Frequency of Price Changes

%
Duration of price spells was calculated over 4 different periods

- Before IT: From 1996-03 to 1999-07
- IT: From 1999-08 to 2002-07
- IT Shock: From 2002-08 to 2003-07
- Post IT Shock: From 2003-08 to 2005-07
Duration of Price Spells and Inflation

• How has the duration of price spells changed over time?

![Graph showing duration in days over different window periods.](chart_image)
Substantial increase in (actual and expected) average inflation imposes a high enough cost of not changing prices and speeds up price reviews.
III. Is the price setting mechanism heterogeneous?

- There is marked heterogeneity on the price setting behavior at the product and sector levels.

- Theoretical studies show that heterogeneity in price-setting imply larger and more persistent effects of shocks. Carvalho (2006)
The Heterogeneity in Price Setting by Economic Sector
IV. How do prices increase compare to prices decrease?

- The average size of price increases is 28% higher than the average size of price decreases.

<table>
<thead>
<tr>
<th>Economic Sector</th>
<th>Size of Price Increase</th>
<th>Size of Price Decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrialized Goods</td>
<td>20.09</td>
<td>14.77</td>
</tr>
<tr>
<td>Non Processed Food</td>
<td>27.27</td>
<td>18.81</td>
</tr>
<tr>
<td>Processed Food</td>
<td>14.50</td>
<td>12.18</td>
</tr>
<tr>
<td>Services</td>
<td>12.35</td>
<td>10.29</td>
</tr>
<tr>
<td>Overall CPI</td>
<td>16.57</td>
<td>12.91</td>
</tr>
</tbody>
</table>
V. Do prices increase more often than they decrease?

- There is a strong symmetry between price increases and decreases

<table>
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<tr>
<th>Economic Sector</th>
<th>Price Decrease</th>
<th>Price Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrialized Products</td>
<td>44.01</td>
<td>55.99</td>
</tr>
<tr>
<td>Non Processed Food</td>
<td>48.46</td>
<td>51.54</td>
</tr>
<tr>
<td>Processed Food</td>
<td>45.50</td>
<td>54.50</td>
</tr>
<tr>
<td>Services</td>
<td>39.70</td>
<td>60.30</td>
</tr>
<tr>
<td>Overall CPI</td>
<td>49.49</td>
<td>50.51</td>
</tr>
</tbody>
</table>
Results suggest that menu costs are relevant.

- Correlation between the magnitude of price change and the duration of price spells is +0.82.
Evidence is not conclusive on the importance of indexation to past inflation.

- Number of times prices were adjusted below and above past inflation is very balanced.
- Average size of re-pricing is larger than the past inflation, regardless of the spell duration.

Results suggest: both past inflation and idiosyncratic shocks influence re-pricing behavior.
Conclusion

- Prices remain fixed between 2.7 and 3.8 months.
- 37% of prices change each month.
- Prices are more flexible in Brazil than in the US or Euro area.

- Substantial increase to average inflation speeds up price reviews.
- Price setting behavior is heterogeneous.
- Results suggest that menu costs are relevant.
- Evidence is not conclusive on the importance of indexation to past inflation.