Price-setting behaviour in the euro area: summary evidence from producer price micro data

RG3 Inflation Persistence Network

Conference
December 10 2004
The purpose

• Set of stylized facts on producer price behaviour in the euro area
• Stylized facts are arranged around two questions
  • “How frequently do prices change?”
  • “How much do prices change?”

Further research is needed for
• “Why do prices change?” Link to theoretical frameworks
• CPI – PPI comparison
The datasets (1)

Quantitative: Micro data underlying the PPI
Actual price quotes (euros)
Products very narrowly defined
Collected by National statistical offices
Firm level
Monthly
The datasets (2)

Qualitative: Micro data from surveying firms
Only price directions (=, +, -)
Collected through surveys
Products more broadly defined
Firm level
Monthly
The datasets (3)

Quantitative

- Italy: 01/1997-12/2002 (72 months)
  60 products ; 71,000 price quotes
- Spain: 11/1991-02/1999 (89 months)
  869 products ; 1,6 million price quotes
- Portugal: 01/1995-08/2002 (92 months)
  538 products ; 0,7 million price quotes
The datasets (4)

Qualitative

• Germany: 01/1995-11/2000 (71 months)
  145 products ; 263,000 price directions
• France: 01/1996-12/2003 (96 months)
  313 products ; 374,000 price directions
How frequently do prices change?

Main industrial groupings (NACE)

• Consumer Food
• Consumer Non durables
• Consumer durables
• Intermediate goods
• Energy
• Capital goods
How frequently do prices change? Heterogeneity

- Example: Italy
- Frequency of price changes

- Food: flour 0.46; bread 0.06
- Durables: freezer: 0.20; desk: 0.02
- Capital goods: tractor: 0.16; calculator 0.02

- Conclusion: In terms of pricing behaviour there is no such thing as a representative product
### How frequently do prices change?

<table>
<thead>
<tr>
<th></th>
<th>Germany</th>
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How frequently do prices change?

Stylized facts:

- Heterogeneous across and within main industrial groupings and across countries
- Energy changes most frequently
- Food or Intermediate changes second most frequently
- Capital goods changes least frequently
How frequently do prices change?

Stylized facts:

• Frequent price changes for products that are simple, basic i.e. close link to input (input price determined on volatile raw material markets + low value added)

e.g. textile fibres, paper and paper board, veneer sheets, plywood, dairy products, non-ferrous metals, metal wires, sugar, coffee, etc..
How frequently do prices change?
Cyclical, Seasonal, Idiosyncratic price changes

Graph 3.

Graph 4.
How frequently do prices change?

Stylized facts:

• Over time the frequency of price changes within an industry can show cyclical, seasonal or idiosyncratic patterns.
## How frequently do prices change? Frequency of price rises

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How frequently do prices change? Frequency of price drops

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How frequently do prices change? Duration dependence

- The probability of changing the price is dependent on the duration (time length) the price was kept unchanged.

Graph 2.

Unconditional state specific transition intensities for investment goods

- Source: Ifo business survey, Munich; own calculations
- Rem.: Duration truncated after 38 months for reasons of readability
Stylized facts:

• Prices rise and drop in about a 60/40 ratio.
• Most frequent rises and drops are in energy.
• Second most frequent rises an drops are in food and intermediate goods.
• Duration dependence: peaks at 1, 2, 3 year.
How much do prices change? Heterogeneity

- Example: Portugal
- Magnitude of price changes
- 50% of the rises are between 2.2 and 9.1%
- 50% of the drops are between 1.8 and 9.8%

- Conclusion: In terms of magnitudes there is no such thing as a representative price change
## How much do prices change? Average% rises

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## How much do prices change? Average% decreases

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How much do prices change?

Stylized facts:

• Price rise and drops symmetrically on average about 5%

• Prices rise and drop in about the same magnitudes across main industrial groupings
Stylized fact:

- Average positive inflation is a result of the slightly higher frequency of increases in prices than decreases with approx. similar magnitudes.

Example Spain: monthly inflation PPI 0.17%
Average good has 13% probability to rise by 5%
Average good has 10% probability to drop by 5%
$0.17\% \approx 0.13 \times 0.05 - 0.10 \times 0.05 = 0.15\%$
Why do prices change? Relation with wage contracts

Share of firms with price increases
and duration of negotiated wage contracts

West Germany

Machinery

Electrical machinery

Source: Ifo business survey, Munich
Rem: Each month the shares of increased, reduced and unchanged prices sum up to 100%.
Why do prices change? Relation with wage contracts

Share of firms with price increases and month of negotiated wage increase
West Germany

Machinery

Electrical machinery

Source: Ifo business survey, Munich
Rem: Each month the shares of increased, reduced and unchanged prices sum up to 100%.
Why do prices change?

Stylized fact (for Germany):
• The frequency of price increases peaks at new negotiated wage contracts
Comparison CPI and PPI

Comparison has limitations:

- Services, unprocessed food in CPI are not included in PPI
- Intermediate goods and capital goods in PPI
- PPI refers to prices on domestic market, CPI includes imported goods
- PPI prices are net of VAT, CPI includes VAT

Comparison on limited set of products or categories (non-food consumer goods/processed food)
Comparison CPI and PPI: tentative

Comparison for Frequency:
Italy: PPI prices more flexible than CPI prices
Spain: PPI prices more flexible than CPI prices
Portugal: PPI prices less flexible than CPI (except food)

Comparison for Magnitudes:
CPI larger absolute magnitudes of changes
Conclusions (1)

What you should remember

• Heterogeneity in frequency and magnitude
• Energy, food and intermediate goods change most frequently
• Frequent price changes for products that are simple, basic i.e. close link to input
• Duration dependence, peaks at 1,2,3 year
• Frequency of price changes over time can show cyclical, seasonal or idiosyncratic patterns
Conclusions (2)

What you should remember

• Prices rise and drop in about a 60/40 ratio.
• Average rise and drop is around 5%
• Average positive inflation is a result of the slightly higher frequency of increases in prices than decreases with approx. similar magnitudes
• Link between price increases and wage negotiations (Germany)
• PPI-CPI comparison not straightforward