

On Implications of Micro Price Data for Macro Models

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Two lessons from micro-data

- Micro data complex; difficult to summarize with 1 statistic
- Large gap between micro and macro data
 - micro prices flexible relative to stickiness in macro data

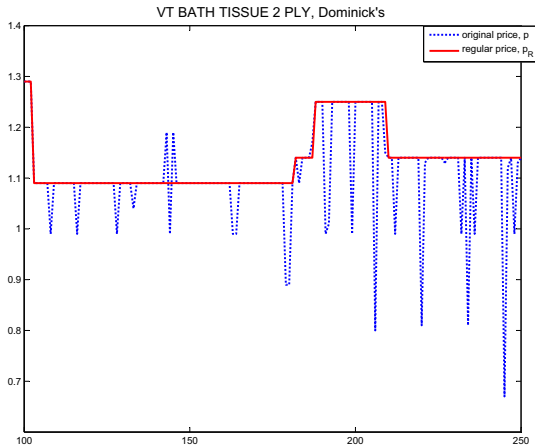
Complications in micro-data

- Heterogeneity/skewness in stickiness across sectors
 - 80 mos (laundry machines) vs. 0.5 mos (gasoline)
 - mean frequency: 4.7 mos., median: 11.5 mos
 - Carvalho'06, Nakamura-Steinsson'07
- Many sales/temporary price changes
 - Kehoe-Midrigan'08: model temporary changes
- Distribution of price changes matters:
 - Large mean size of price changes
 - Large dispersion in size of price changes
 - Golosov-Lucas'07, Midrigan'06

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Challenge 2: many temporary price changes



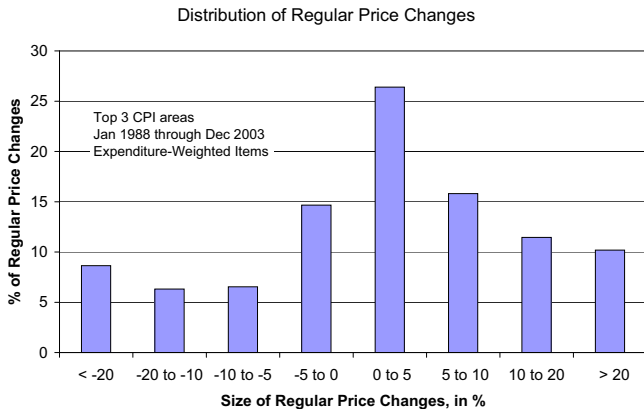
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Distribution of price changes



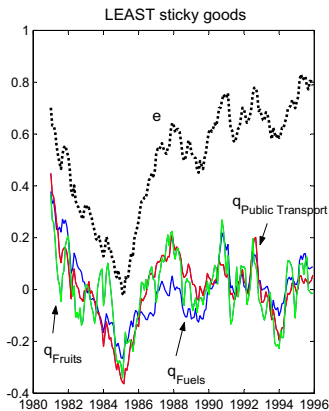
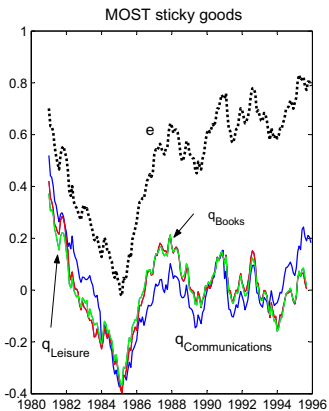
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Main lesson: menu costs not enough

- Micro data: prices sticky for 2-3 quarters
- Macro data: need 10 quarters of price stickiness
- To bridge gap, need model in which:
 - prices change frequently
 - but do not respond to nominal disturbances
- Also evident in:
 - sales return to pre-sale price
 - cross-section of real exchange rates

Kehoe-Midrigan '07: sectoral real exchange rates



Potential solutions:

- Real rigidities
- Informational frictions
- Inventory models of money/ segmented asset markets
 - More empirical work necessary to quantify these
 - Distinguishing btw alternatives important for policy
 - E.g., welfare costs of inflation

Real rigidities 1: complementarities

- Costly to deviate from competitors' prices
 - Kinked demand, specific factors/decreasing returns
- Micro-data suggests small
 - Dotsey-King '05, Klenow-Willis '07, Burstein-Hellwig '07
 - Inconsistent with size of relative price changes in data
 - Need large menu costs to keep prices sticky
- Extension to multi-product firms?

Real rigidities 2: real flexibilities

- Lower elasticity of real marginal cost to output
 - Sticky wages/materials prices, variable utilization, preferences
 - Difficult to measure directly

Kryvtsov-Midrigan'08: measure elasticity of real marginal cost to Y

- Use elasticity of Inventories to Y in data
- Idea: model with inventory-holding motive implies:

$$p \sim \frac{\theta}{\theta-1} V'(s)$$

$$V'(s) \sim \omega$$

- Data: elasticity of I/S ratio to Y is -0.8
- Model with fixed ordering costs and stockout-avoidance:
 - need elasticity of real marginal cost to Y of 0.92
 - slightly less than inverse elast. of intertemp. substitution
 - related to Thomas irrelevance result

Conclusions

- Micro-data very useful to quantify menu-cost models
- Micro-data has also shown menu costs alone insufficient
- Need more work to bridge gap between macro and micro