Discussion: Heterogenous Price Rigidities and Monetary Policy

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Inflation: Drivers and dynamics

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Paper in a Nutshell

- **Big question**:

  What are the effects of a monetary shocks?

- **This paper**:

  role of heterogeneity in price rigidities across sector for ...

  i. distributional consequences

  ii. aggregate consequences

- **Main empirical result**: (really nice!)

  Statistical significant correlations between selling and income share of college graduated with frequency of price change

- **Main theoretical result**:

  i. Consumption of college-graduate is more to monetary shock (22%)

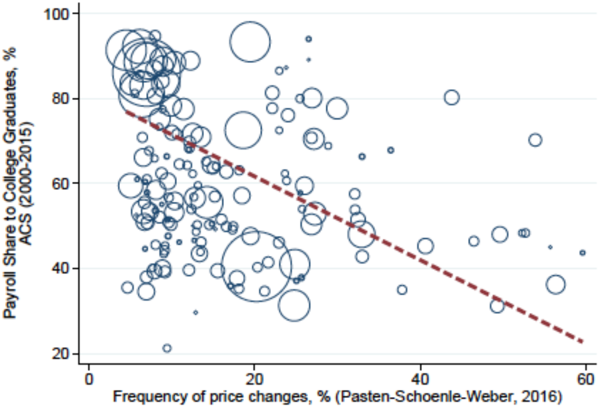
  ii. Output effect is stronger with heterogeneity (5%)

Roadmap

- Present facts
- Discuss role of facts for propagation of monetary shocks

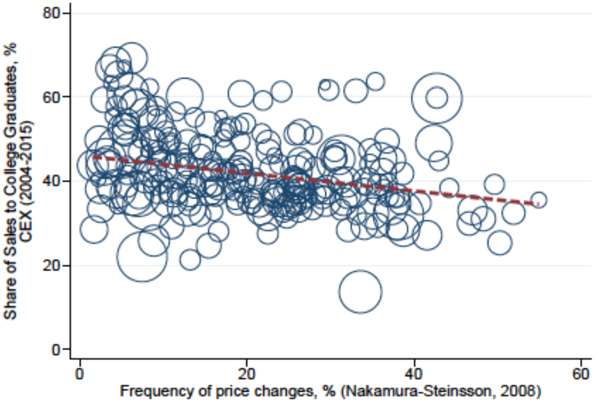
Fact I

Strong negative correlation between PPI frequency of price change and payroll share of college graduate



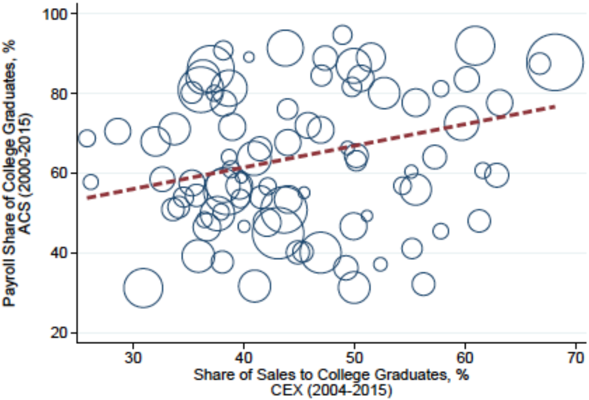
Fact II

Weak negative correlation between CPI frequency and selling share to college graduate



Fact III

Positive correlation between selling and payroll shares of college graduate



Warning: matching CEX data with ACS is not immediately

Implication of facts

- Intuition for heterogenous implications
  - Different people consume different goods
  - Different goods have different price rigidities

  $\Rightarrow$ Heterogenous implication for nominal shocks

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  - Different people consume different goods
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  - $\Rightarrow$ Heterogenous implication for nominal shocks
- Are facts useful for thinking propagation of monetary shocks?
- Analyze within the context of Werning2015, Auclert2017
  - Framework that focuses in "demand" size (redistribution)
  - Ignore “supply: side of NKM
  - Not useful for these facts
- Analyze within the context of Kaplan/Moll/Violante2017
  - Maybe a final step
- Provide an intermediate step

Are facts useful for thinking propagation?

Are facts useful for thinking propagation? Maybe

- Static model
- Complete markets
- Exogenous money supply $M(s)$
  - s : discrete exogenous state with prob. $\pi(s)$
- 2 agents denoted with $h = C, NC$
  - Supply type specific labor (L^h) with efficient A^h
- N sectors in the economy $n = 1, 2, \ldots, N$
  - Continuum of producer $i \in [0, 1]$
  - Fraction θ_n after the shock ($(1 - \theta_n)$ before shock)
  - Technology: $y_{in} = \varphi_n (L^C_{in})^{\alpha_n} (L^{NC}_{in})^{1-\alpha_n}$

Agents' problem and market clearing

- Household chooses consumption ($c_{i,n}^h$), labor (L^h) and money (M^h)

$$\max \mathbb{E}_s \left[\log(c^h(s)) - L^h(s) + \log\left(M^h(s)\right)\right], \ s.t$$

$$c^h(s) = \prod_{n=1}^{N} c_n^h(s)^{\omega_n^h} \quad ; \quad c_n^h(s)^{\frac{\gamma-1}{\gamma}} = \int_0^1 c_{i,n}^h(s)^{\frac{\gamma-1}{\gamma}} di$$

$$0 = \sum_s Q(s) \left[\sum_{n=1}^{N} \int_0^1 p_{i,n}(s) c_{i,n}^h(s) di + M^h(s) - W^h(s) A^h L^h(s) - T^h(s)\right]$$

- Firms choose contingent price $p_{i,n}(s)$ (no contingent price $p_{i,n}$)

$$\max_{p_{i,n}(s)} \mathbb{E}_s \left[\sum_h c_{i,n}^h(p_{i,n}(s)) \left(p_{i,n}(s) - W^C(s)^{\alpha_n} W^{NC}(s)^{1-\alpha_n}\right)\right]$$

- Money, good and labor markets clear

Models' characterization: $c^C, c^{NC}, c = c^C + c^{NC}$

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- Money optimality + money market clearing:

$$\sum_h M^h(s) = M(s) \;\; ; \;\; \pi(s)/M^h(s) = Q(s)/\lambda^h \Rightarrow \frac{\pi(s)}{Q(s)} = (\lambda^C + \lambda^{NC})M(s)$$

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- Labor supply optimality:

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- Consumption + firms optimality: $\pi(s)/c^h(s) = p^h(s)\lambda^h Q(s)$

$$\hat{c}^h = \hat{W}^h - \hat{P}^h = \hat{M} - \sum_{n=1}^{N} \omega_n^h \hat{P}_n = \hat{M} - \sum_{n=1}^{N} \omega_n^h \theta_n[\alpha_n \hat{M} + (1-\alpha_n)\hat{M}])$$

  - $\hat{c}^h = \hat{M}(1 - \sum_{n=1}^N \omega_n^h \theta_n)$ and $\hat{c} = \hat{M}(1 - \sum_{n=1}^N \theta_n \tilde{w}_n)$
  - $\tilde{\omega}_n$: aggregate consumption share in sector n

Main result and discussion

Propagation of money shocks depends only on average frequency of price change

- Extension I: More general preferences
  - Similar result for standard calibration for curvature of labor
- Extension II: Dynamic model
  - Replace ave. frequency ($\sum \omega_n \theta_n$) by ave. duration ($1/\sum \omega_n \theta_n^{-1}$))
  - Alvares/Lippi/Le Bihan (2016), Baley/Blanco (2019)
- Extension III: Incomplete markets (positive monetary shock)
  - Distribution of wealth (wages) respond to money shock
  - College (low MPC) relative wages increases (evidence?? magnitud??)

  $\Rightarrow$ Decrease effect of a monetary shock

Conclusion

- Nice paper over a a growing field
- Present new facts
- Main challenge: are these fact useful for macroeconomist?