PRICE RIGIDITY: MICROECONOMIC EVIDENCE AND MACROECONOMIC IMPLICATIONS

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RESEARCH QUESTION AND POSITION

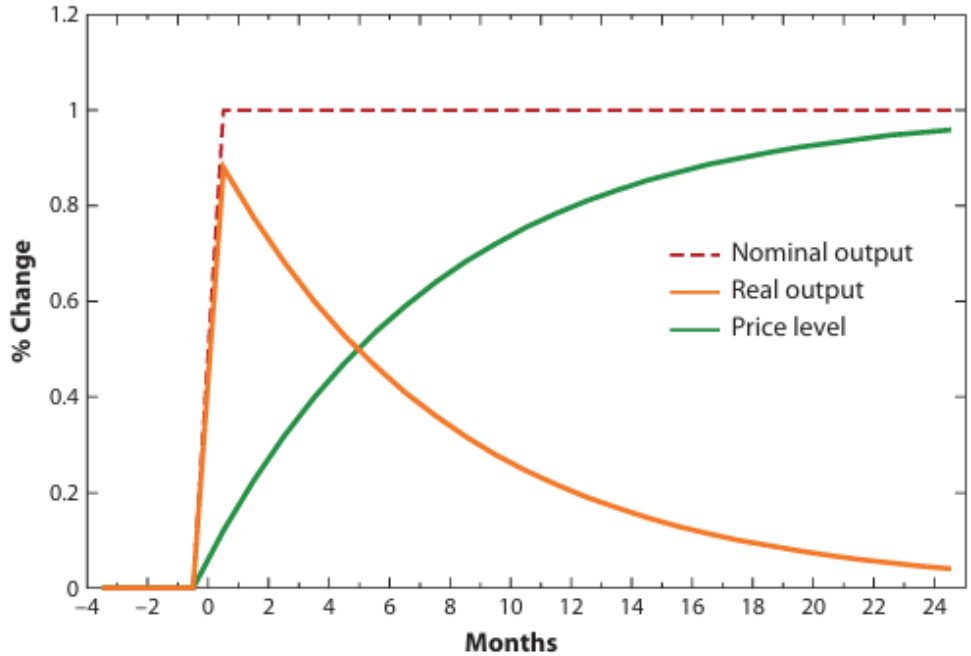
- What is the empirical and theoretical evidence of different forms of price rigidity in the economy? What are its implications on demand shocks on output?
- Demand shocks have large effects on real output. For demand shocks to propagate through the economy, monetary non-neutrality plays a big role.
- Review empirical literature on price adjustment and see how micro price rigidity translates to sluggishness of aggregate price level.

FACTS ABOUT FREQUENCY OF PRICE LEVEL CHANGES IN US

- **NK models (1990s-2000s)** Prices change once a year. **Bils and Klenow (2004)** - median duration of prices - 4.3 months.
- Calculation of price duration is not straightforward. Number of price changes marred by stockout, sales, product substitutions vs regular prices.
- Which measure to choose, average price change frequency or median price change frequency?
- How should timing and extent of price changes be treated? Price changes may be occuring by factors other than a firms desire to change prices- competitors behavior, seasonality etc.

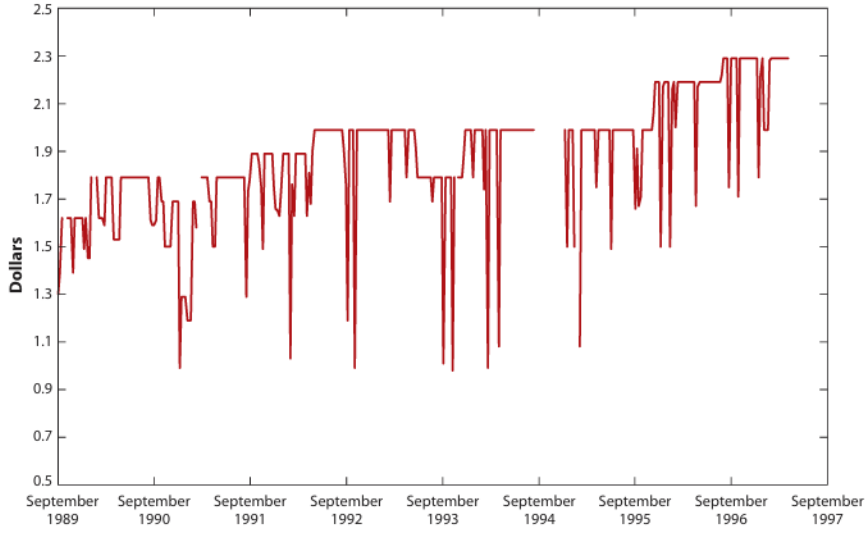
MAIN ELEMENT OF ANSWER TO THE QUESTION: SIMPLE MODEL OF MONETARY NON NEUTRALITY

- Under Calvo Pricing, $p_t = (1 - \alpha)p_{it}^* + \alpha p_{t-1}$
- If nominal output, $m_t = y_t + p_t$ and monetary authority varies money supply so that m_t follows a random walk, we get $p_{it}^* = m_t$
- If initial valus of $y_{-1} = p_{-1} = 0$, then $y_t = \alpha^t$.



MECHANISM: PRICE RIGIDITIES

- Temporary Sales- How to treat them?



- Timing and magnitude of sales are responsive to the state of the economy and a large fraction is sold in sales.
- Kehoe and Mirdigan (2010), Guimaraes and Sheedy (2011), Anderson et al (2012) etc- Sales are highly transitory and have limited effect on aggregate price changes- **Choose regular price changes.**

HETEROGENEITY IN FREQUENCY OF PRICE CHANGE

- What is more important? Median frequency of price change or Mean frequency of price change?
- **Bils and Klenow (2002), Carvahlo (2006) and Nakamura and Steinsson (2010 with menu costs)** find that choosing median frequency fits the data best.
- What if price change frequency is no longer random? Inflation raises firm incentive to change prices.
- In the neighborhood of 0 inflation, prices unresponsive to inflation. When inflation is high frequency of price change is around two-thirds wrt inflation.

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HAZARD FUNCTION AND COORDINATION FAILURES

- **Hazard function:** Probability of price changing vs how long has it remained unchanged.
- NS (2008) - For price changes including sales- downward sloping. For regular price changes- somewhat downward sloping then flat. Spike at 12 months.
- **coordination failures**- Firms do not change prices to optimal levels because other firms have not so yet. - staggered prices and stragetic complimentarity leads to price sluggishness.

CONCLUDING REMARKS

- Understanding the dynamics of sluggish price levels is crucial in understanding how monetary shocks and demand shocks affect the economy.
- This survey highlights how different assumptions on wage rigidities have vastly different implications as well as what we observe in real life.
- Allows us to think how changes in input costs translate into changes in pricing.