Relative Price Shocks and Inflation

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Motivation

- Friedman: "Inflation is ... a monetary phenomenon"
- This paper: in stable monetary regimes, inflation is mostly a "relative price shock phenomenon".
- To make the case, the paper estimates a multiple-sector DSGE model with *sector-specific productivity shocks*
- It finds that a relative price increase of a given sector is realized mainly via a nominal price rise of that sector, while other sectors prices remain largely unchanged, causing inflation.

Model

- 15 sectors, each with its own trend-stationary productivity process
- Identical firms within each sector
- Rotemberg pricing with full indexation, gives rise to 15 sectoral Phillips curves
- Taylor rule with smoothing
- Estimation by maximum likelihood on US data from 1995M1 to 2020M1

Findings

- 75% of inflation volatility is due to relative price shocks
- The paper then studies: (1) the low inflation period in the US between 2012 and 2019 and (2) the Covid period
- (1) It finds that the contribution of monetary policy to inflation was relatively small. Instead, it was gasoline and health care prices that contributed the most.
- (2) As for Covid, the surge in inflation was mainly due to motor vehicles, with monetary policy also playing a role.

Comments

- Excellent work, on the important topic of the drivers of inflation
- Model has all the necessary ingredients, simple and elegant.
- One could say, preaching to the choir: a number of papers have found large effects of relative price shocks on inflation, most notably from commodity (oil) shocks (e.g. Nakov and Pescatori, EJ 2010).
- But this paper generalizes the idea to other relative price shocks, e.g. restaurants or health care shocks

Comments

- The authors call them "price shocks", but they are really productivity shocks in the model. Could be preference shocks as well.
- Q: what is the alternative hypothesis? That quarter-to-quarter fluctuations in inflation are caused mostly by aggregate shocks, and that sector-specific shocks (magically) wash out in the aggregate
- But sectors are large, so even a shock originating in one sector will typically have some aggregate effects (unless the the central bank reacts aggressively to sectoral shocks).
- This paper argues that monetary policy typically allows inflation to rise, so that prices in other sectors don't have to fall in nominal terms. Q: is that (close to) optimal monetary policy?

Comments

- Q: can monetary policy still be lurking behind the relative cost movements? Potentially, yes:
- E.g. in a model where one sector's output (with flexible price, energy) is used as input into another, sticky price, sector (goods).
- Easy monetary policy transmits fast to the energy sector, which now looks like a relative price shock for the goods sector.
- Goods inflation follows, and looks like it was caused by the relative price increase in energy. But energy was just a proximate cause...

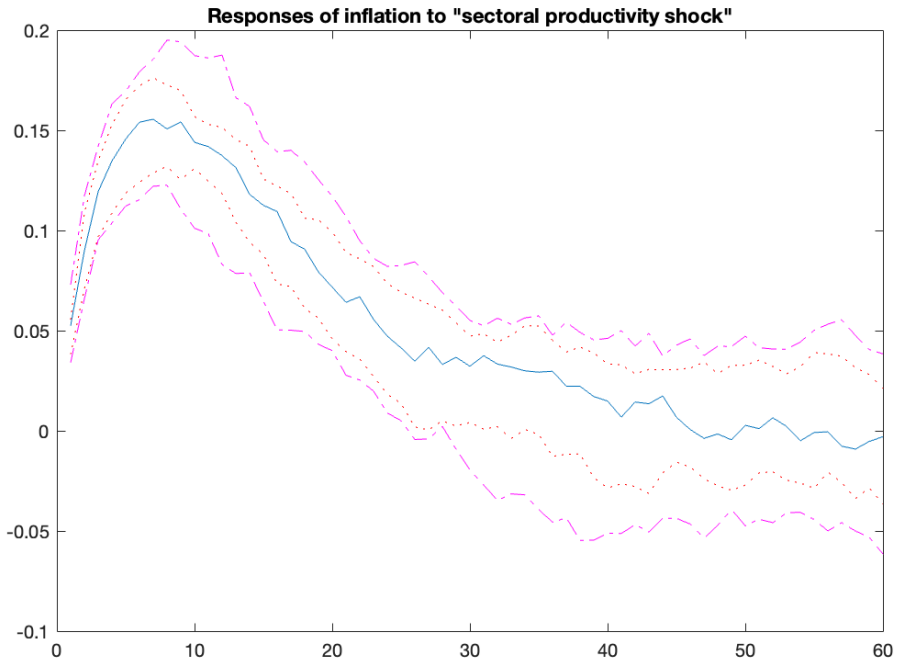
Comments

- Even greater granularity? Can the *finite* number of firms per sector be behind sectoral price shocks?
- Consider a model with no sectoral shocks but with 15x100 Golosov-Lucas type firms hit by *firm-level* productivity shocks and a monetary shock.
- Group firms arbitrarily into 15 sectors of 100 firms each. (works with more firms too if firm size follows Zipf's law, as in data).
- Since firms are a finite number, firm-level shocks will not completely wash out and different sectors will have different productivities.
- Identify sector productivity innovations by fitting an AR1 process and plot the IRFs from a shock to "sector productivity"

Comments

- This will attribute non-trivial inflation volatility due to sectoral shocks in a model where all of inflation is due to monetary shocks alone!

Figure: Inflation volatility from illusory sectoral shocks
(see Costain and Nakov JME 2011, sec. 4.4)

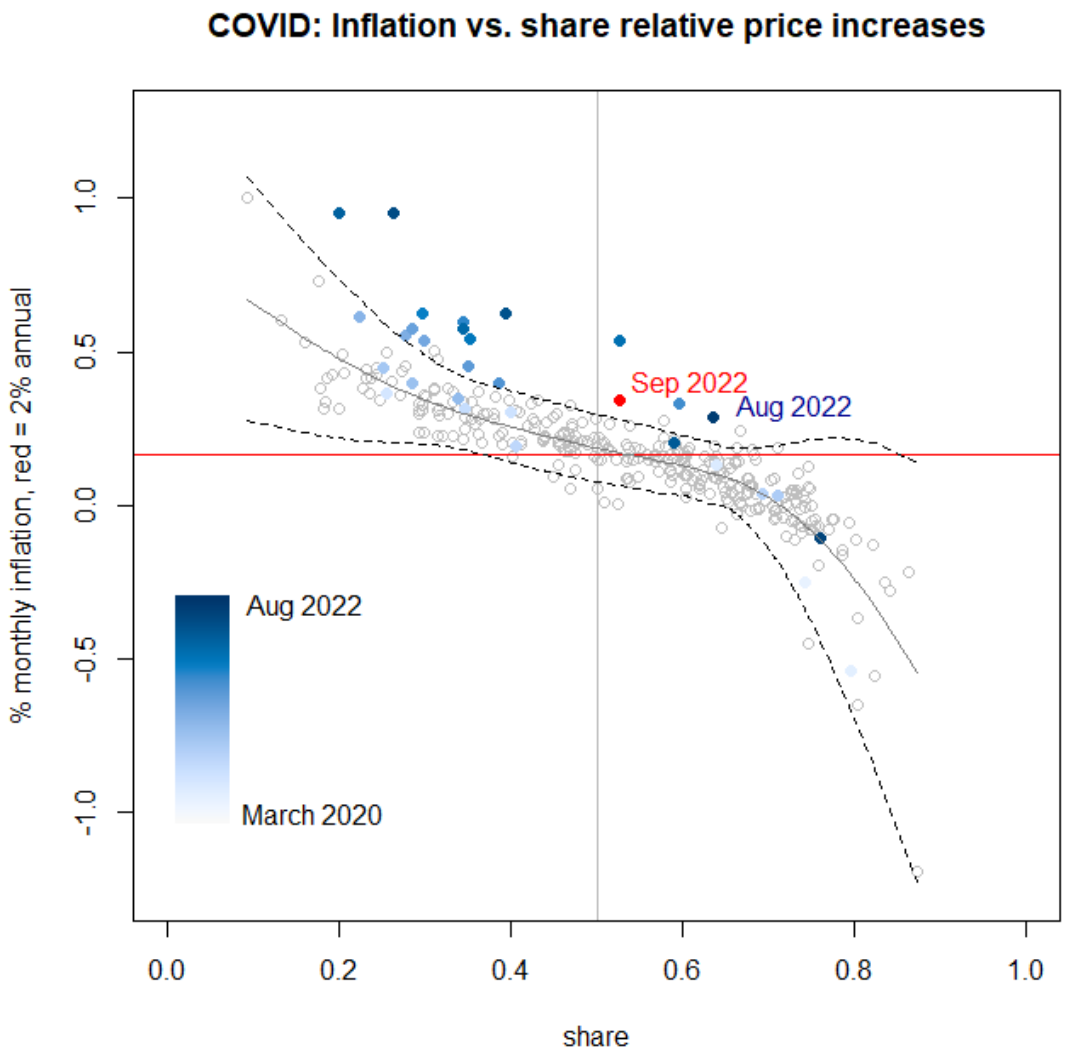


Matching 2nd moments

Properties of estimated model: 2nd moments

Variable	StDev		Autocorrelation	
	Data	Model	Data	Model
	(1)	(2)	(3)	(4)
Nominal interest rate	0.110	0.043	0.992	0.939
Aggregate inflation	0.187	0.252	0.387	0.139
Sectoral price changes:				
Motor vehicles and parts	0.315	0.348	0.307	0.325
Furnishings and household durables	0.377	0.432	−0.019	0.000
Recreational goods	0.355	0.415	0.026	0.047
Other durable goods	0.597	0.628	−0.170	−0.013
Food at home	0.263	0.307	0.266	0.228
Clothing and footwear	0.517	0.566	0.016	0.039
Gasoline and other energy goods	4.986	4.828	0.349	0.211
Other nondurable goods	0.303	0.382	−0.140	−0.024
Housing and utilities	0.140	0.197	0.338	0.324
Health care	0.148	0.224	0.116	0.207
Transportation services	0.511	0.558	−0.045	0.005
Recreation services	0.208	0.273	0.097	0.127
Food services and accommodations	0.169	0.211	−0.056	0.288
Financial services and insurance	0.722	0.762	−0.236	−0.012
Other services	0.171	0.221	0.356	0.410

Covid-19


COVID: Inflation vs. share relative price increases
% monthly inflation, red = 2% annual
1.0
0.5
0.0
-0.5
-1.0
0.0
0.2
0.4
0.6
0.8
1.0
share
Sep 2022
Aug 2022
Aug 2022
March 2020

Production structure, lags, and optimal inflation?

- In practice, is it advisable to react to relative price (e.g. energy) shocks or look-through?
- With 2 sectors in parallel, it is optimal to target inflation in the sticky price sector rather than a broad inflation measure (Aoki, JME 2001)
- With 2 sectors, input-output: energy (input) and final goods (output), strict final goods inflation targeting is optimal (unless something breaks "divine coincidence", Nakov and Pescatori, JMCB 2010).
- If monetary policy operates with a long lag, then it may depend on the expected duration of the relative price shock...

Conclusion

- Excellent and timely piece of work!
- Looking forward to its final print version