Monetary Regimes and Inflation Persistence

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This talk is based on 2 papers of mine:

- ***'U.K. Monetary Regimes and Macroeconomics Stylised Facts'***
- ***'Investigating Inflation Persistence Across Monetary Regimes'***

➔ I'll mostly focus on the U.K. and inflation persistence, but I'll also discuss other countries and stylised facts …

Key findings: under inflation targeting, in the United Kingdom, Canada, Sweden, and New Zealand

- **inflation exhibits little or no persistence**
  ➔ in the U.K. it is slightly *negatively* serially correlated
- **the indexation parameter in hybrid New Keynesian Phillips curves is zero, or close to zero …**

Qualitatively the same results hold for the United States, the United Kingdom, and Sweden under the Gold Standard

➔ Under regimes characterised by clearly defined nominal anchors, both reduced-form and structural inflation persistence essentially disappear …

The inflation persistence problem:

Several authors have attempted to hardwire structural inflation persistence into macro models:

- **Fuhrer-Moore, QJE 1996**
- **hybrid—i.e., mixed backward and forward-looking—New Keynesian Phillips curves with indexation a-la-Christiano-Eichenbaum-Evans, JPE 2005; Smets-Wouters, JEEA, 2003; etc …)**
- **'information free-riders' a-la-Gali-Gertler (JME, 1999)**
- **'sticky information' models ➔ Mankiw-Reis**
- **'limited information processing capacity' models ➔ Sims**

Conceptually related: the debate on the New Keynesian Phillips curve …

The debate on the New Keynesian Phillips curve

- **Sbordone, and Gali-Gertler: 'forward-looking component is dominant'**
- **Linde, and Rudd-Whelan: 'your finding is the product of limited-information methods'**
- **Linde: 'based on FIML, backward-looking component is dominant'**

Most people here are working with U.S. post-WWII data …

➔ **not clear to me this is best way to assess these models**

- **Post-Bretton Woods U.S. does not have a clearly defined nominal anchor**

➔ **Learning is most likely a crucial feature of this period**

➔ **How do I know that what I see in the data is not the product of the lack of a clearly defined anchor??**

How could learning be at the roots of all this??

- **Erceg and Levin (JME, 2003): 'learning about a shifting inflation target' ➔ it generates inflation persistence within a purely forward-looking model**
- **Kosuke Aoki's work in progress: 'learning about the inflation target causes higher order expectations to become relevant …'**
  ➔ public learns about the inflation target
  ➔ CB learns about the public's estimate of the target …
  ➔ this hall of mirrors effect generates high inflation persistence and volatility …

So, idea:

'Look at regimes with clearly defined nominal anchors'

➔ inflation targeting and the Gold Standard

Let's start with some reduced-form evidence …

Reduced-form evidence for the United Kingdom

- **Metallic standards: inflation was white noise or negatively serially correlated**
- **Interwar period: little persistence**

Post-WWII era:

Inflation persistence in the U.K.: Hansen 'grid-bootstrap' MUB estimates of ρ, and 90% confidence intervals

	Bretton Woods	Bretton Woods to inflation targeting	Inflation targeting
Retail price index	0.56 [0.33; 0.83]	0.91 [0.72; 1.03]	-0.10 [-0.79; 0.68]
Consumer price index		0.93 [0.89; 0.98]	-0.19 [-0.54; 0.15]
GDP deflator	0.44 [0.07; 0.83]	0.88 [0.70; 1.04]	-0.31 [-0.69; 0.10]

- **Bretton Woods: little persistence**
- **Bretton Woods to inflation targeting: very high persistence → for much of this period, U.K. had no clear nominal anchor**
- **Inflation targeting: slight negative serial correlation**

Current U.K. regime contains a component of mean reversion in the log price level

➔ **it is a hybrid between inflation and price level targeting**

What about other inflation targeting countries???

Evidence less dramatic than for the U.K., but:

	Bretton Woods	Bretton Woods to IT	Inflation targeting
		Canada	
CPI	0.71 [0.54; 0.89]	0.91 [0.72; 1.04]	-0.25 [-0.73; 0.22]
GDP deflator	0.77 [0.46; 1.05]	1.00 [0.78; 1.04]	0.34 [0.00; 0.73]
		New Zealand	
CPI	0.29 [0.02; 0.56]	0.82 [0.67; 1.01]	0.41 [0.14; 0.72]
GDP deflator			0.01 [-0.63; 0.70]
		Sweden	
CPI	0.29 [-0.01; 0.59]	0.53 [0.12; 1.02]	0.37 [-0.24; 1.05]
GDP deflator			0.06 [-0.47; 0.63]

- **Bretton Woods to inflation targeting: high persistence**
- **Inflation targeting: very little persistence**

Finally—but this is not new, see e.g. Barsky (1987)—under the Gold Standard inflation was white noise in all countries I consider

➔ **U.K., U.S., Sweden …**

So, inflation persistence???

- **Inflation is persistent if you focus on the post-WWII U.S.**
- **but it is not if you look at**
  - **U.S. under the Gold Standard**
  - **other countries under Gold Standard and inflation targeting**

Objection: 'What about the Eurozone??'

➔ O'Reilly and Whelan: inflation is basically a unit root …

My answer: 'Eurozone synthetic data artificially conflate radically different experiences.' Example:

- **For Germany—only country to have a stable monetary regime during entire period—Coenen & Levin show that inflation is purely forward-looking**

  ➔ consistent with the present work …

- **Italy: in the 1970s we had wage indexation around 100%—see Modigliani & Padoa-Schioppa (*Moneta e Credito*, 1977)—I bet you'll find a lot of persistence …**

Critique: 'All this is purely reduced-form …'

➔ doesn't have any clear-cut implication for structural macro models

What matters is structural inflation persistence …

➔ in New Keynesian models, a significant backward-looking component

That's entirely correct, this evidence is suggestive that inflation might be purely forward-looking, but in no way it is decisive …

So let's go structural …

Structural evidence

Linde (JME, 2005): 'if you use FIML, you get a dominant backward-looking component …'

➔ Linde's dataset: U.S., 1960Q1-1997Q4

➔ Not surprising that he finds a dominant backward-looking component!!!

But what if we apply full-information methods to inflation-targeting countries and data from the Gold Standard??

I estimate *via* Bayesian methods a model very close to Linde

- **Methodology: same as that of Schorfheide and co-authors**
  ➔ random-walk Metropolis, etc, etc, etc …
- **Priors: all standard in the literature**
  ➔ prior for indexation parameter flat over [0, 1) …
  ➔ … I want the data to speak freely …

NK model with backward-and forward-looking components:

$$y_t = \gamma y_{t+1|t} + (1-\gamma) y_{t-1} - \sigma^{-1}(R_t - \pi_{t+1|t}) + \epsilon_{y,t}$$

$$\pi_t = \frac{\beta}{1+\alpha\beta}\pi_{t+1|t} + \frac{\alpha}{1+\alpha\beta}\pi_{t-1} + \kappa y_t + \epsilon_{\pi,t}$$

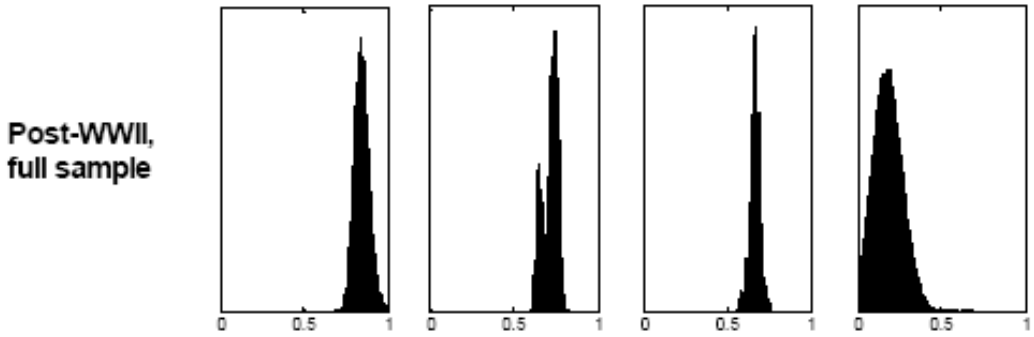
$$R_t = \rho R_{t-1} + (1-\rho)[\phi_\pi \pi_t + \phi_y y_t] + \epsilon_{R,t}$$

- **IS shocks and monetary policy shocks allowed to be serially correlated**
- **Phillips curve shocks modelled as white noise**
  - ➔ **I force all inflation persistence to be captured by indexation parameter, α**
- **Model is closed-economy …**
  - ➔ **estimated based on GDP deflator—measure of domestically generated inflation**
  - ➔ **estimation of open-economy specification in progress**

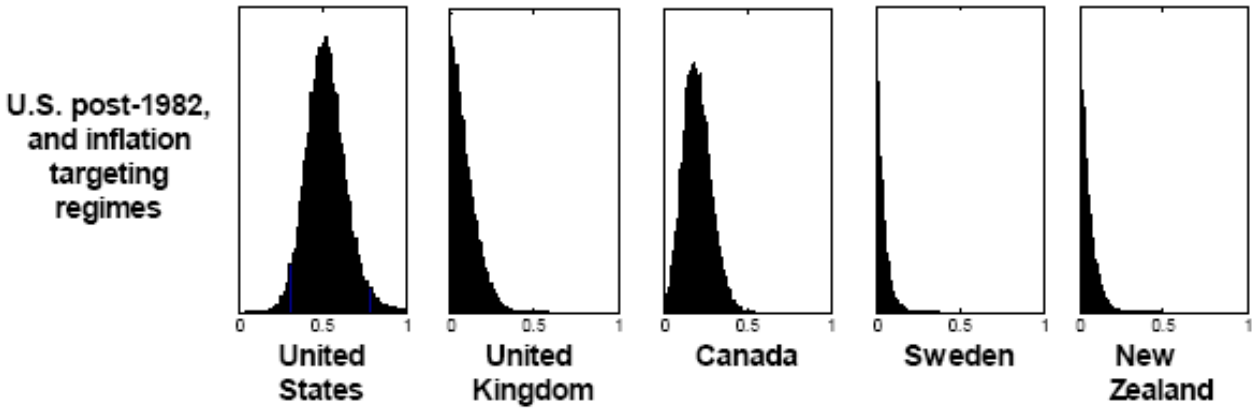
Let's see the results …

Posterior distributions for the indexation parameter

➔ **Remember: prior is completely flat …**



Full sample:
high indexation for all countries except Sweden



Post-1982 U.S.:
consistent with Gali-Gertler (1999), inflation is more forward-looking …

Inflation-targeting countries: mode at 0.15 for Canada, at zero for all the other three countries

➔ **under inflation targeting, inflation is (almost) purely forward looking**

Gold Standard: I have identical results

- **for U.S., U.K., Sweden, mode of indexation parameter equal to zero**
- **I specify the monetary rule in terms of the rate of growth of base money**
  - **➔ suggestions on more appropriate specifications are most welcome**

So, bottom line: 'Under regimes characterised by clearly defined nominal anchors, both reduced-form and structural inflation persistence vanish …'

➔ inflation is purely forward-looking

➔ *prima facie* evidence that persistence found in U.S. post-WWII data may be due to the lack of a nominal anchor

➔ i.e., may not be structural in the sense of Lucas (1976)

Implications

Hardwiring post-WWII U.S. inflation persistence into the structure of the model is potentially highly misleading

- **you estimate a 'structure' which is not structural in the sense of Lucas (1976)**
  ➔ can't use it for the purpose of evaluating alternative monetary regimes

Next on my list:

'How does the Mankiw-Reis model fare when confronted with data from inflation targeting and the Gold Standard?'

We'll see …