Monetary Regimes and Inflation Persistence

Luca Benati
Bank of England

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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

<table>
<thead>
<tr>
<th>Post-WWII era:</th>
<th>Bretton Woods</th>
<th>Bretton Woods to inflation targeting</th>
<th>Inflation targeting</th>
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</thead>
<tbody>
<tr>
<td>Retail price index</td>
<td>0.56 [0.33; 0.83]</td>
<td>0.91 [0.72; 1.03]</td>
<td>-0.10 [-0.79; 0.68]</td>
</tr>
<tr>
<td>Consumer price index</td>
<td>0.93 [0.89; 0.98]</td>
<td>0.88 [0.70; 1.04]</td>
<td>-0.19 [-0.54; 0.15]</td>
</tr>
<tr>
<td>GDP deflator</td>
<td>0.44 [0.07; 0.83]</td>
<td>0.88 [0.70; 1.04]</td>
<td>-0.31 [-0.69; 0.10]</td>
</tr>
</tbody>
</table>

- **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 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, \( \alpha \)
- 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 …
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

Full sample:
- high indexation for all countries except Sweden

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

Posterior distributions for the indexation parameter

Remember: prior is completely flat ...

I. Post-WWII, full sample

II. U.S. post-1982, and inflation targeting regimes

United States  | United Kingdom  | Canada  | Sweden  | New Zealand
**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 …