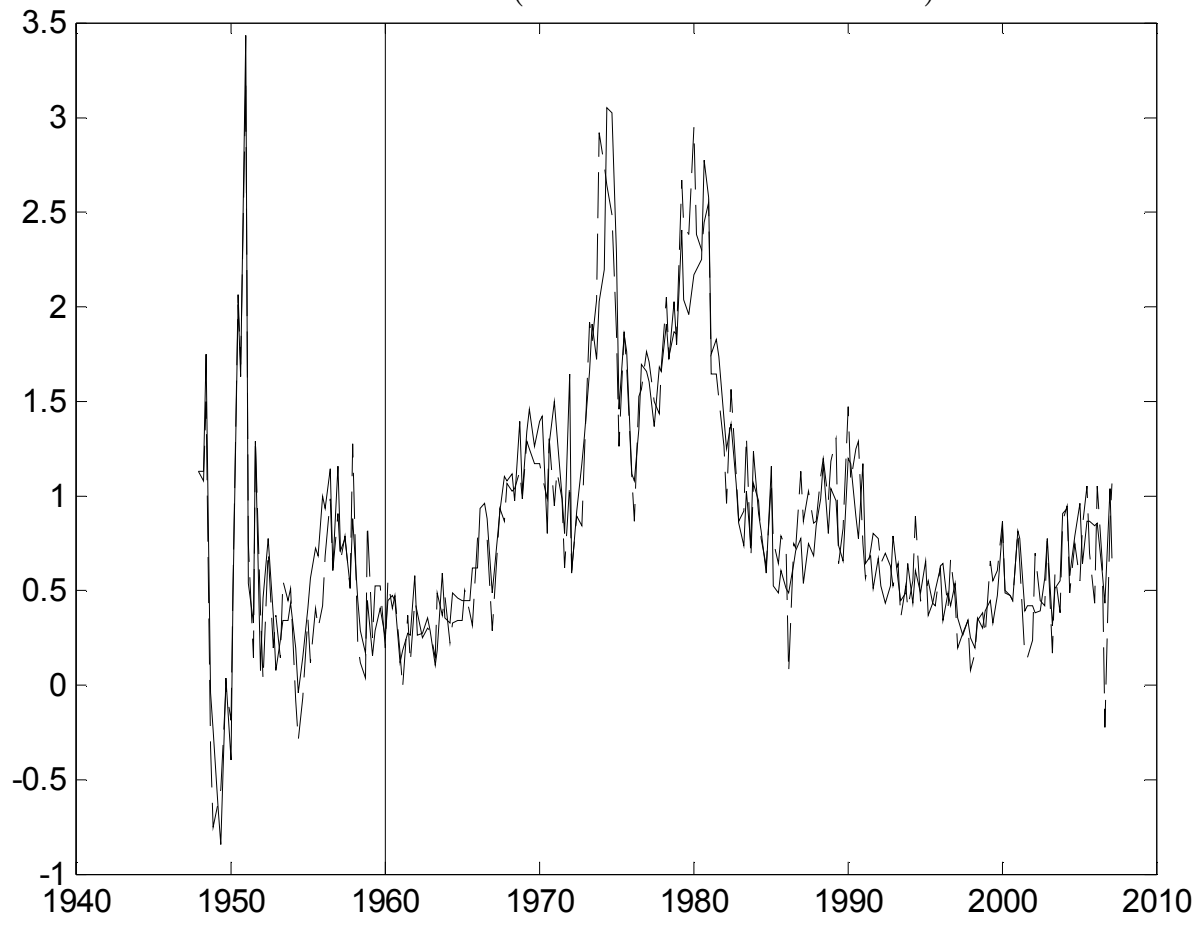


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Comment on « Inflation-Gap Persistence in the US »
By T.Cogley and T.Sargent

Banque de France-CEPR-EABCN Workshop
6-7 september 2007

US inflation (GDP and PCE deflators)



Starting point: a controversy about statistical properties of US inflation

(probably one of the most analyzed time-series in the world.)

- Cogley and Sargent (2002, 2005) Inflation (*gap*) persistence **unstable** (and has lowered).
- Stock (2002), Sims (2002). Inflation persistence stable, once changes in volatility are accounted for.
- Pivetta and Reis (2001) Inflation persistence **high** and **stable**.
- Levin and Piger (2003) Inflation persistence **low** and **stable**, once regime shifts in mean inflation are accounted for.

Note: similar controversy with euro area inflation

(O'Reilly and Whelan 2005 vs Altissimo et al. 2006)

A semantic issue: inflation versus inflation gap persistence.

- The authors agree that inflation has a unit root and focus on inflation gap persistence.

“A consensus has emerged that trend inflation is well approximated by a driftless random walk”

- Is there actually a consensus ?

Levin and Piger (2003) for a “stationarity within regime shift” view of inflation.

Also Bataa et al. (2007, this workshop): inflation modelled with structural breaks in unconditional means.

The paper: a further investigation of the controversy - Main Contributions:

- Estimate sophisticated unobserved component model of inflation with
 - Time varying parameters
 - Stochastic volatilities (“great moderation”)
by Bayesian methods
- Both Univariate and Multivariate (VAR) evidence
- A new measure of inflation persistence: the R² statistics for a j-step multivariate forecast.
Complements univariate measures (sum of AR parameters; largest root of AR; IRF half-life)
- Relate results to recent findings (Atkeson and Ohanian, 2001, Stock and Watson, 2005)

A UC-SV model of inflation - Univariate case:

$$\pi_t = \mu_{t-1} + \rho_{t-1}\pi_{t-1} + \varepsilon_{\pi t}$$

$$\mu_t = \mu_{t-1} + \varepsilon_{\mu t}$$

$$\rho_t = \rho_{t-1} + \varepsilon_{\rho t}$$

$$\varepsilon_{\pi t} = \sqrt{h_{\pi t}} v_{\pi t}, \text{ with } v_{\pi t} \sim N(0, 1)$$

$$\begin{pmatrix} \varepsilon_{\mu t} \\ \varepsilon_{\rho t} \end{pmatrix} = Q_t^{1/2} v_t \text{ with } v_t \sim N(0, I_2)$$

$$Q_t = B^{-1} H_{st} B^{-1'}, H_{st} \text{ diagonal with elements } h_{\mu t}, h_{\rho t}$$

$$\ln h_{\pi t} = \ln h_{\pi t-1} + \sigma_{\pi} \eta_{\pi t}$$

$$\ln h_{\rho t} = \ln h_{\rho t-1} + \sigma_{\rho} \eta_{\rho t}$$

$$\ln h_{\mu t} = \ln h_{\mu t-1} + \sigma_{\mu} \eta_{\mu t}$$

$$\eta_{\pi t}, \eta_{\mu t} \text{ and } \eta_{\rho t} \sim N(0, 1) \text{ subject to } |\rho_t| < 1$$

Main results

- Inflation gap persistence **significantly** increased from 60's to early 80's then decreased
- This finding is robust to considering
 - PCE or GDP deflator
 - Univariate or multivariate evidence
- Emphasis on assessing significance of changes in persistence, by examining the joint posterior distribution of persistence indicators for specific couples of dates.

Model estimation by Bayesian techniques

- Posterior distribution (for each parameter and date) computed using MCMC algorithms
- (Layman's) questions:
 - Sims (2002) argue that the prior “implies a lot of weight on stationary models”
Is this issue a concern here?
 - Use Bayesian methods to compare/combine the AR and the VAR models ?
 - A ridge in the bivariate distribution of ρ_t 's: a “pile-up” problem?

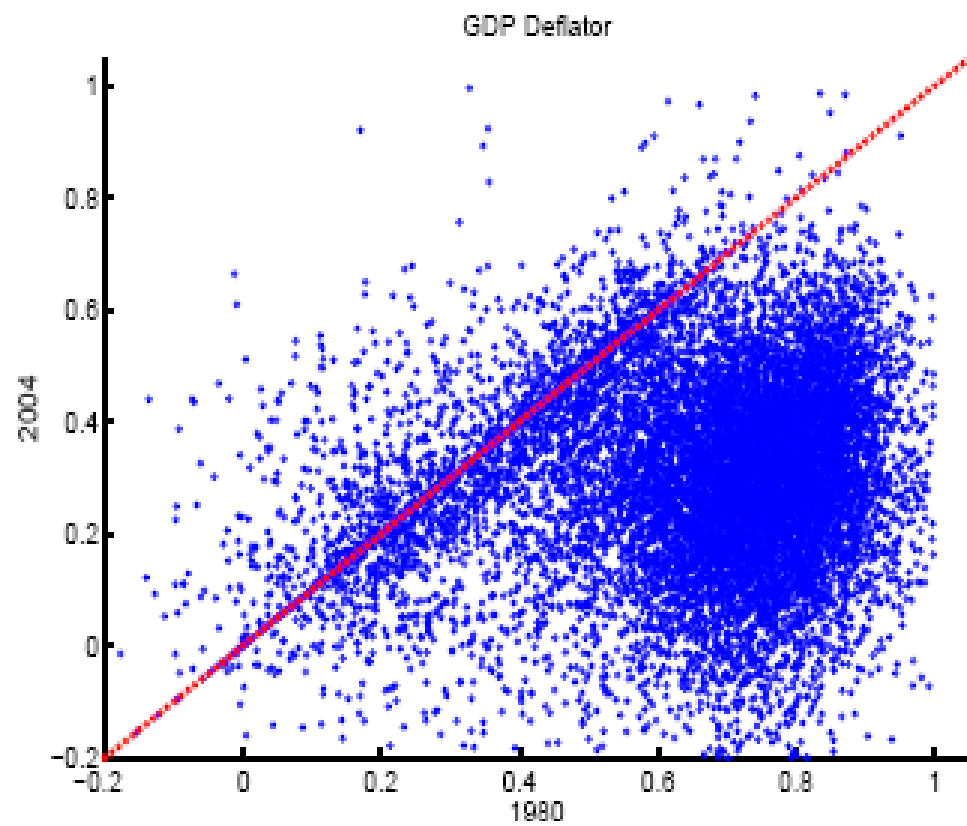


Figure 5: Joint Distribution for ρ_{1980} and ρ_{2004} , GDP Inflation

Remarks on the statistical significance of changes in persistence

- Evidence of change is less clear-cut for multivariate indicators, at 4 and 8 quarters horizons.
For $j=8$ quarters the proba. of no changes ranges from 11% to 21% (table 2).
What would be the relevant horizon for assessing persistence?
- On comparing persistence in 1980 vs other dates (1960 and 2004)
Year 1980 is the date with the higher estimated persistence
Is there a “date selection” issue affecting the interpretation of p-values ? cf. the distribution of the Sup of Chow test statistics (Andrews, 1993).
Suppose the DGP is same model, but with a constant ρ_t .
What is that likelihood that the time series pattern for estimated median posterior ρ_t displays the level of variability of figure 4?

Inflation gap vs inflation trend:

How much does the gap -and change in its persistence- matter?

- Economic interpretation of the persistence in gap is not emphasized
(candidates: changes in monetary policy, private sector behaviour or expectation scheme...)
- From a forecasting point of view, what matter is overall inflation

Does accounting for the decrease in gap persistence improve forecast?

Is the gap quantitatively important: what is the contribution of the gap variance to overall inflation forecast error, say 4 or 8 quarters ahead?

Trend inflation

- Trend inflation seems to play a substantial role at low and high frequencies
- Trend inflation most plausible interpretation: an estimator of the Fed target (“trend inflation is usually pinned down by a central bank’s target”)
- More evidence on trend inflation could then be useful, e.g.:
 - the time pattern of h_{μ} (volatility of trend inflation innovation)
 - comparing the VAR and AR models (Posterior odds and probabilities,...)

Trend inflation

