



Monetary policy strategy: “Old issues and new challenges”

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Discussion of „Uncertainty about Perceived Inflation Target and Monetary Policy“

by Kosuke Aoki and Takeshi Kimura

Uncertainty about Perceived Inflation Target and Monetary Policy

Kosuke Aoki and Takeshi Kimura

Discussion by Martin Bodenstein

The views expressed in this presentation are solely my responsibility and should not be interpreted as reflecting the views of the Board of Governors of the Federal Reserve System and or any other person associated with the Federal Reserve System.

1 The Volcker Disinflation and the Great Moderation

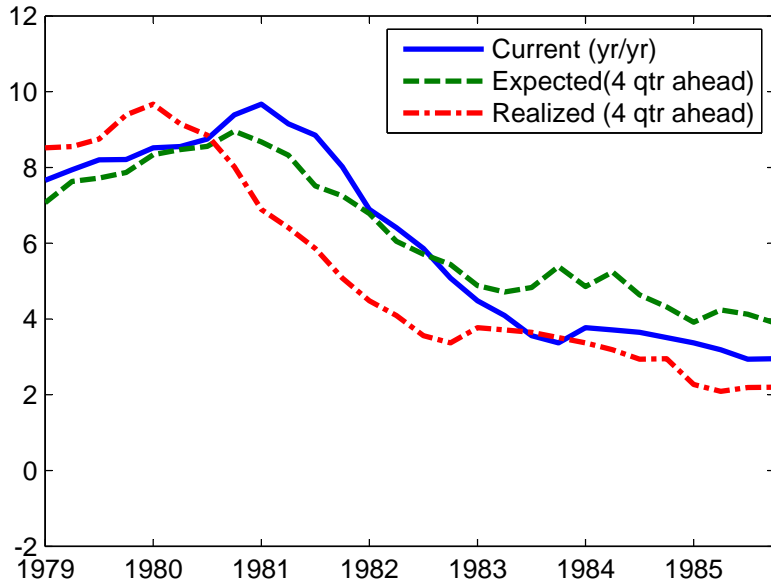
1.1 Stating the problem

Interesting paper that provides a possible mechanism for

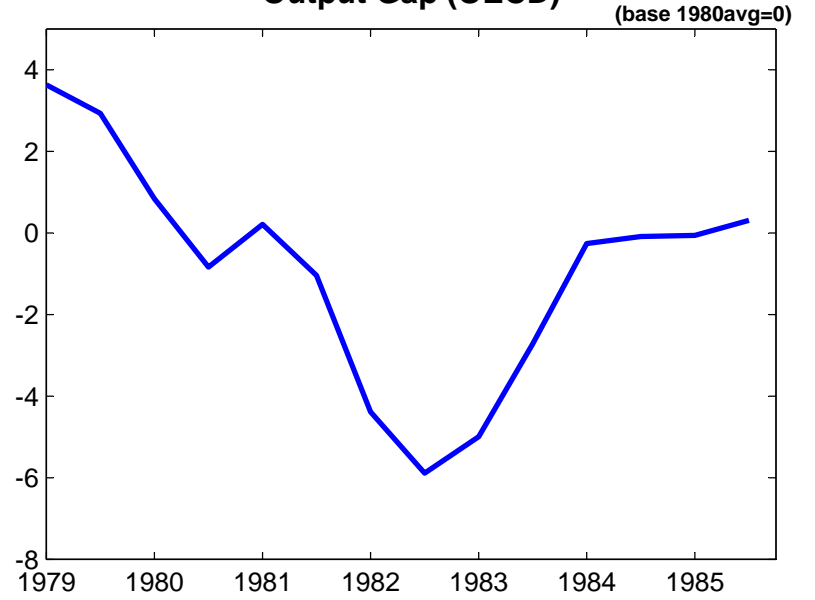
- the slow adjustment process of inflation expectations during the Volcker disinflation,
- the decline in inflation volatility and inflation persistence since the 70's (Great Moderation).

The Volcker Disinflation

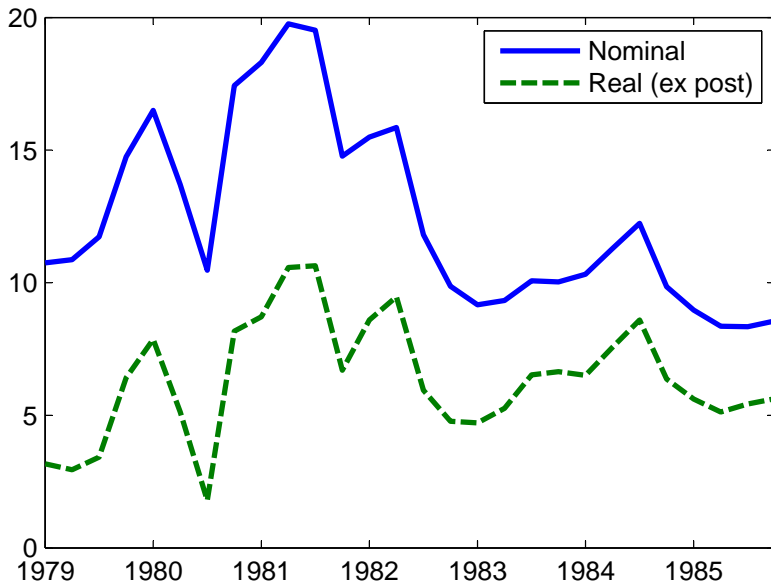
Inflation and Expected Inflation



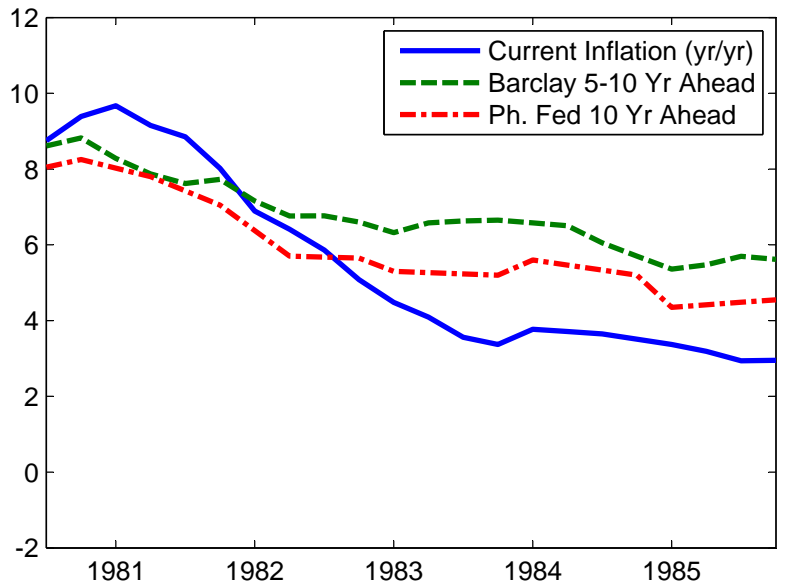
Output Gap (OECD)



Federal Funds Rate



Long-term Expected Inflation



Starting point of the paper

- If shocks are *iid.*, information is complete, and prices are fully flexible, inflation is *iid.* of the form

$$\pi_t = \pi^* + u_t.$$

- There is no persistence in the inflation process, and in response to shocks or shifts in π^* the adjustment is immediate.

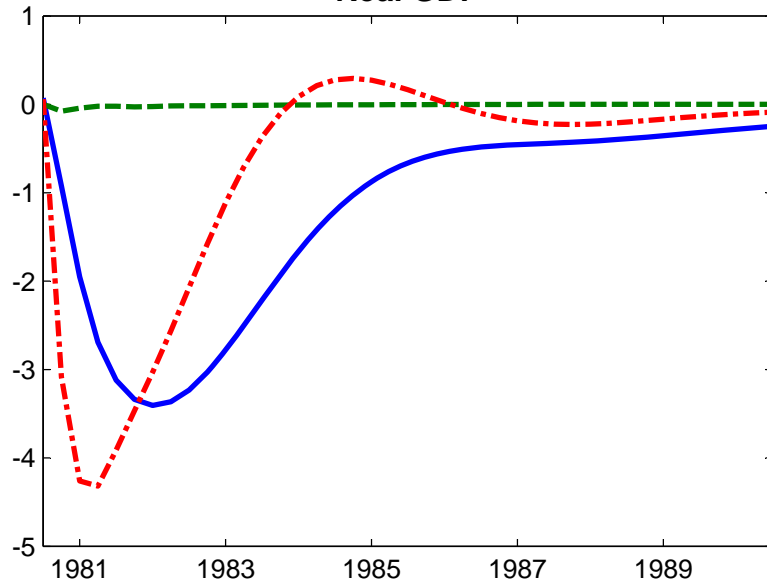
1.2 Introducing inflation persistence

How to get persistence in inflation (and inflation expectations) in particular in the transition period from high to low inflation?

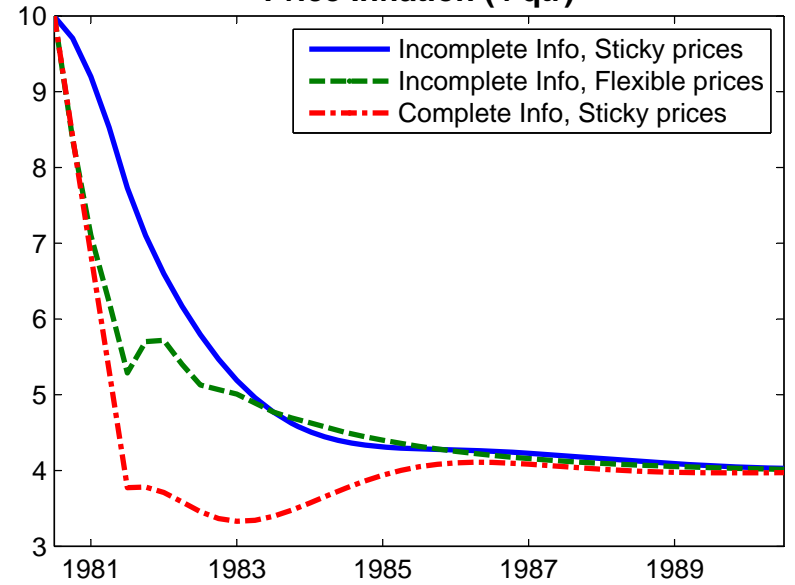
- Erceg/ Levin (2001):
 - sticky prices and wages delay the transition process in accord with the contract multipliers,
 - private sector's information about the inflation target is incomplete, but the central bank has full information,
 - problem of the private sector can be separated from the remainder of the (linearized) model, and it can be solved using Kalman filtering.

Volcker Disinflation in Erceg and Levin (2003)

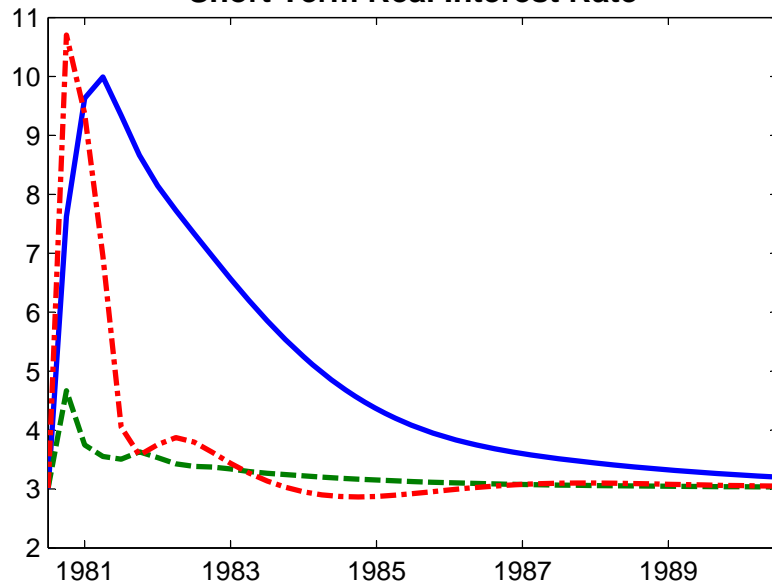
Real GDP



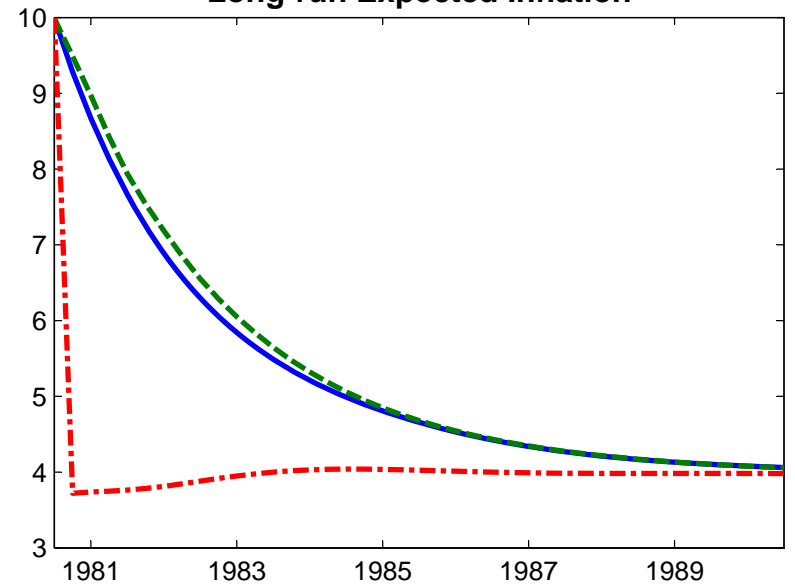
Price Inflation (4 qtr)



Short Term Real Interest Rate



Long-run Expected Inflation



- Aoki/ Kimura (2007):
 - prices are fully flexible,
 - private sector's information about the inflation target is incomplete,
 - but in contrast to Erceg/ Levin, the central bank has incomplete information about the private sector's perception of the inflation target.

Erceg/ Levin emphasize how learning can propagate the effects of sticky prices. Aoki/ Kimura show how differences in information sets across agents can propagate the effect of learning (see also the works of Phelps, Woodford, Amato and Shin, Hellwig).

2 Comments on the Model

Two equation model with flexible prices (see Woodford 2003 for microfoundation):

1. Fisher equation

$$i_t = r_t^n + E_{t|p} \pi_{t+1}$$

2. Monetary policy rule

$$i_t = \phi (\pi_t - \pi_t^*) + \pi_t^* + E_{t|c} r_t^n$$

2.1 Key features

If information is complete, inflation is given by

$$\pi_t = \pi^* - \frac{1}{\phi} u_t.$$

and any adjustment to shocks is immediate.

Adding information frictions

1. Households are uncertain about the inflation target π_t^* as in Erceg and Levin (2003).
2. Central bank does not observe the natural rate r_t^n directly.
3. Central bank does not observe the households' perception about the inflation target.
4. Households know about the central banks estimate of the natural rate. (This cuts higher-order expectations at the order of 2.)

Putting the model ingredients together

$$\pi_t = \pi^* - \frac{1}{\phi} u_t + \frac{1}{\phi} \left(E_{t|c} E_{t|p} \pi^* - \pi^* \right)$$

inflation depends on the central bank's estimate of the household's perception of the inflation target π^* :

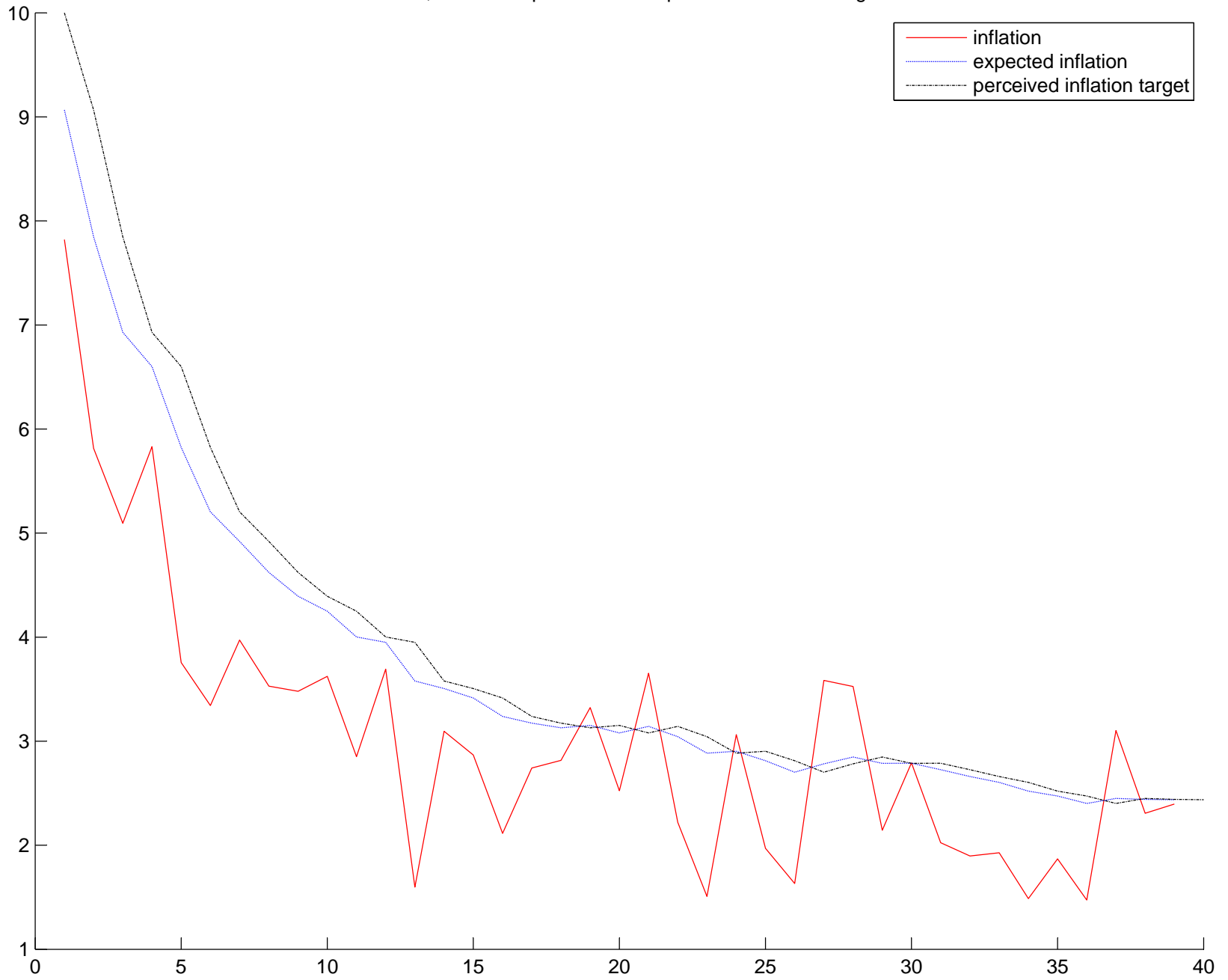
- If only households face information problem $E_{t|c} E_{t|p} \pi^* = E_{t|p} \pi^*$.
- Here $E_{t|c} E_{t|p} \pi^* \neq E_{t|p} \pi^*$, which introduces additional learning dynamics (and persistence in inflation to changes in π^*).
- All beliefs become endogenous (and the solution is quite complicate).

Simplified model

I assume that the central bank has full information. I use this simplified model partly to suggest different ways of presenting the implications of the model.

Importance of σ_u , σ_r and $\tau_{p|0}$: more uncertainty in any of these variables makes learning harder. Central bank and private sector have to filter out the noise.

Inflation, inflation expectations and perceived inflation target



Comments in information structure

1. Orphanides (2001) stresses the problems of central banks to estimate r_t^n correctly.
2. However, I would be careful about linking the current paper to tightly to Orphanides (2001):
 - Misperception about the natural rate by the central bank can explain the inflation experience of the 70's for a stable monetary policy rule. The data shown by Orphanides suggests that the mistakes were large and persistent (not *iid.* as in the paper by Aoki and Kimura).

- Orphanides also argues that the policy rule in the 70's was consistent with a 2% inflation target. Does this mean that the Volcker disinflation was just about realizing the miscalculation of the output gap and the natural rate?
3. There is still a lot of room for debate, when it comes to the Volcker disinflation, but Orphanides' work might not be the best reference to justify some to the assumptions in the paper.

4. Why should firms be less informed about the state of the economy than the private sector? For robustness, it might be worth to compare the model's predictions under different informational assumptions:
- private sector does not observe the value of r_t^n , but only observes $E_{t|c}r_t^n$,
 - central bank and private sector fully observe r_t^n .
5. Why is there uncertainty about π^* rather than ϕ ? Either way seems to conflict with Orphanides' interpretation. But this should not be the final word on the discussion about the 70's, in particular since the authors seem to prefer to interpret the uncertainty about the inflation target as reflecting imperfect credibility of the inflation target.

Other comments

- It would be very helpful to be more specific about the full solution of the model in the appendix.
- Draw a closer relation to the literature of higher-order expectations (Woodford, Hellwig, Amato and Shin). Why are expectations of order 3 (or 4) and higher pinned down?
- How does this paper relate to the work by Clarida, Galli, Gertler (1999), and Christiano and Gust (1999), which attempts to explain the rise in inflation? Can you make the point for a joint cause?

3 Going forward

In the current version of the model, output (gap) variations (reflected in variations of the natural rate of interest) are given exogenously.

Aoki/ Kimura:

- changes in the inflation target go along with a transition period in which inflation is persistent and volatile.

But:

- Volcker disinflation was also accompanied by a dramatic output loss.
- Literature on the Great Moderation also emphasizes the decline in output volatility.

- From Ahmed, Levin and Wilson (2002):

	1960:1-1983:4	1984:1-2002:1
GDP	4.43	2.26
CPI	3.63	1.47

Ahmed et al claim that the reduction in GDP volatility was mostly due to good luck, but the decline in CPI volatility was mostly due to good policy. Is this the last word?

In its current version, the model is consistent with the findings by Ahmed et al: output volatility is exogenous (luck) and a decline in inflation is due to policy. But: changes in the volatility of output affect monetary policy – is this luck or policy?

It seems crucial to endogenize output. This could be done in a model similar to Woodford (2003) with firms facing technology shocks that are not fully observed by the central bank:

- pricing policy of firms is based on the firms perception about the inflation target,
- the central bank cannot distinguish between the level of technology and the perceived inflation expectations of the private sector.

4 Conclusion

- Interesting paper, that applies the idea of the differences in information sets to an important (and probably more believable) question than some of the related work.
- But still have a long way to go (different information structures, endogenous GDP).