Discussion of "Monetary Policy and the Great Moderation" by Klaus Adam

Marco Del Negro

Federal Reserve Bank of New York

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Rational Inattention: A Theory of Noise

- Firms track p^*: $\max_p \; -\boldsymbol{E}[(p-p^*)^2|I]$

- where the amount of information I they can collect about p^* is limited, namely the reduction in the uncertainty about p^* is subject to an information capacity constraint:

$$\frac{1}{2}\left(\ \log_2(var(p^*)) - \log_2(var(p^*|I))\ \right) \leq K \tag{1}$$

Rational Inattention: A Theory of Noise

- This is equivalent to a signal-extraction problem where firms observe an error-ridden measurement of the unobserved state p^*:

$$s = p^* + \eta, \quad \eta \sim N(0, \sigma_\eta^2)$$

which implies that

$$\begin{aligned} p \equiv \boldsymbol{E}(p^*|s) &= \frac{var(p^*)}{var(p^*) + \sigma_\eta^2} s \\ var(p^*|s) &= var(p^*) - \frac{var(p^*)^2}{var(p^*) + \sigma_\eta^2} \end{aligned}$$

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- where the noise variance σ_η^2 has to satisfy (1):

$$\sigma_\eta^2 = \frac{1}{2^{2K} - 1} var(p^*)$$

RI vs Signal-extraction RE

- Under Signal-extraction RE as the variance of the signal p^* increases:
  - firms' response to a given aggregate shocks increases: As $var(p^*) \to \infty$ the kalman gain $k = \frac{var(p^*)}{var(p^*) + \sigma_\eta^2} \to 1$.

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- Under RI the variance of the noise has to increase with $var(p^*)$ for given K, therefore:
  - the kalman gain is fixed at $k = 1 - 2^{-2K}$: firms' response to a given aggregate shocks is constant.
  - the pricing error variance $var(p - p^*) = (1 - k)var(p^*)$

Noise and the Great Moderation

- A positive mark-up shocks lowers the output gap (wedge between actual and natural output), and at the same time increases inflation.

- Trade-off for the policy-maker, whose objective is to stabilize the output gap:
  - Responding to mark-up shocks reduces the direct impact on the output gap . . . but increases the volatility of inflation hence the noise. In eq., this indirectly increases the volatility of the gap.

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- Policy with commitment/averse to inflation (e.g. post-Moderation) takes this into account.
- Policy with discretion(e.g. pre-Moderation) ignores the noise effect $\longrightarrow$ high volatility of inflation and output.

Endogenous Noise, Exogenous Capacity?

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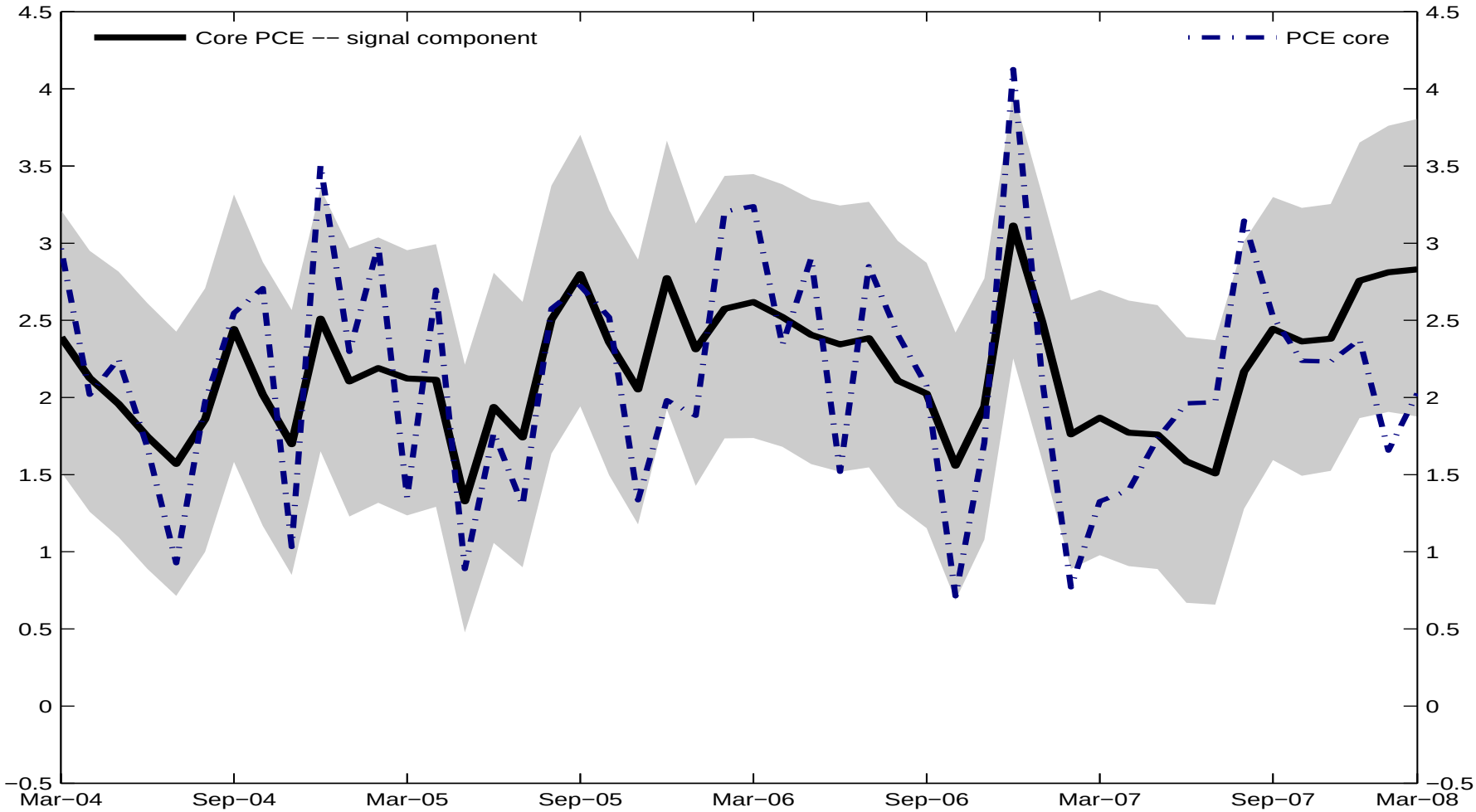
- High inflation countries have a higher k (Lucas 73).

- Quantitatively, this is an important part of the story.

Common or Firm-specific Processing Technology/Noise?

- If the information is processed individually by each firm, noise is firm-specific and washes out in the aggregate.
- Quantitatively, another important part of the story.

Common or Firm-specific Processing Technology/Noise?



The Model and VAR "Facts" on the Great Moderation

- VAR papers usually interpret the findings as supporting the "good luck" version of the Great Moderation.
- Here we have a model that generates the same "facts" but where policy is the only driving source.

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    - In the dynamic model this fact holds for $k \longrightarrow 1$, but doesn't the noise $\longrightarrow 0$ for $k \longrightarrow 1$?

VAR residuals (Primiceri 05)

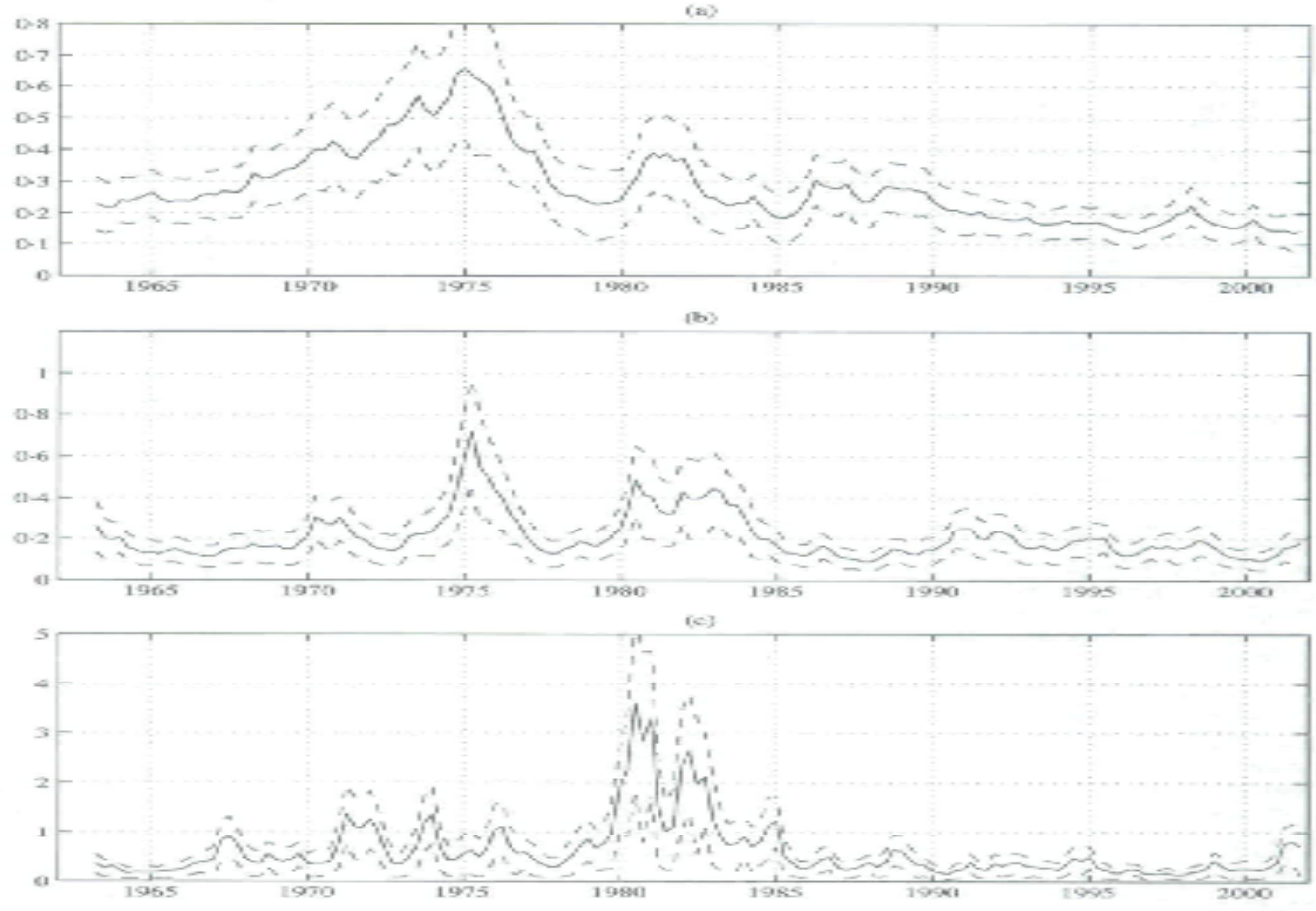

FIGURE 1

Posterior mean, 16-th and 84-th percentiles of the standard deviation of (a) residuals of the inflation equation, (b) residuals of the unemployment equation and (c) residuals of the interest rate equation or monetary policy shocks

If identified monetary policy shocks are the measure of non-systematic policy actions, it seems natural to measure the relative importance and changes of non-systematic monetary policy by the time varying standard deviation of the identified monetary policy shocks. Figure 1(c)

Impulse-responses (Primiceri 05)

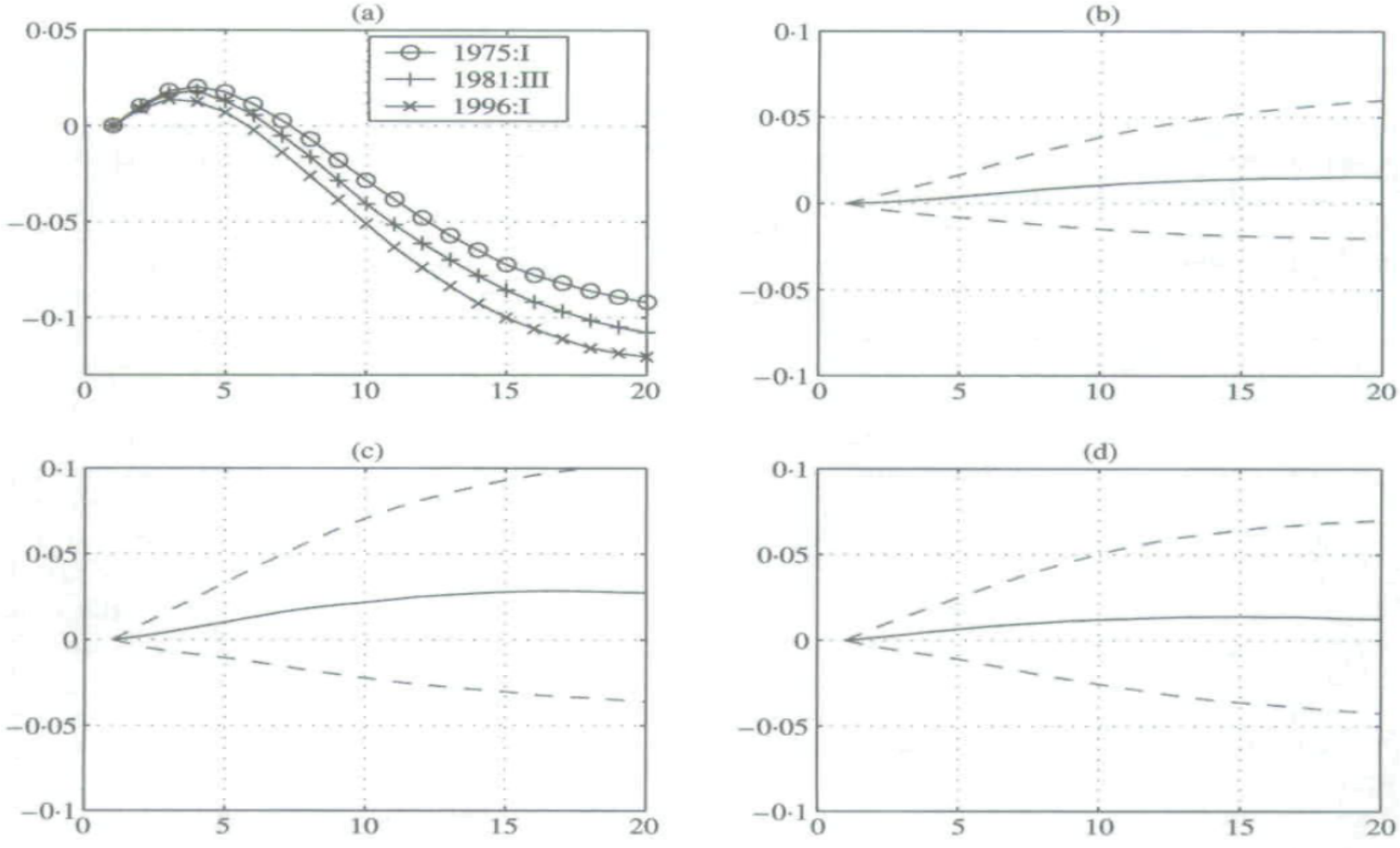

FIGURE 2

(a) Impulse responses of inflation to monetary policy shocks in 1975:I, 1981:III and 1996:I, (b) difference between the responses in 1975:I and 1981:III with 16-th and 84-th percentiles, (c) difference between the responses in 1975:I and 1996:I with 16-th and 84-th percentiles, (d) difference between the responses in 1981:III and 1996:I with 16-th and 84-th percentiles

Impulse-responses Gambetti-Pappa-Canova (06)

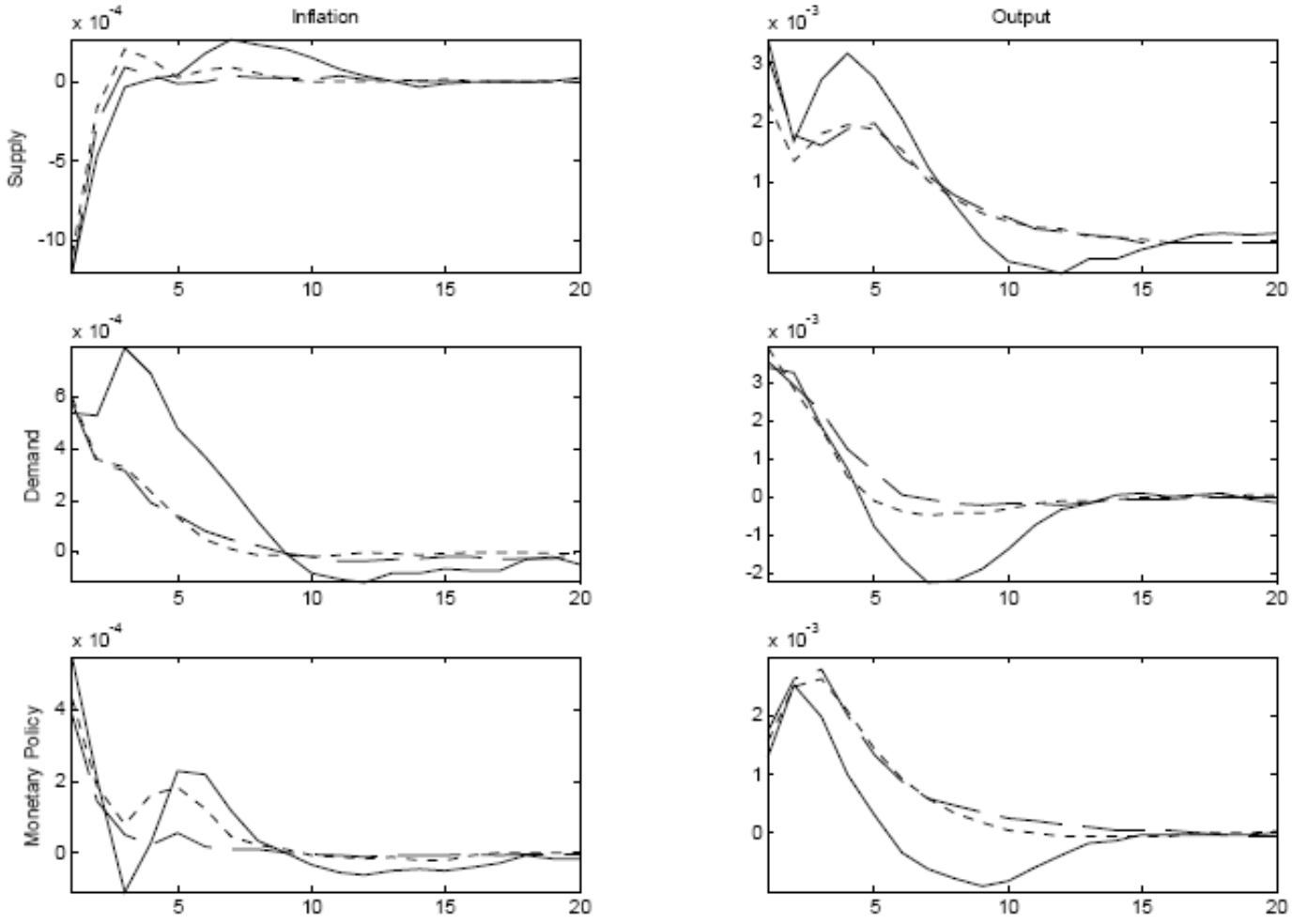

Figure 3: Impulse responses, 1973 (solid), 1986 (dotted), 2003 (dashed)

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    - But in the model the policy rule does change – not the autoregressive part but the contemporanoeus response.

Conclusions

- Good paper, nice story.
- Turning the VAR stuff on its head is also cute.
- But ultimately, can this story fly quantitatively?