Comments on

“The Design of Monetary and Fiscal Policy: A Global Perspective”

by Jess Benhabib and Stefano Eusepi

George W. Evans
University of Oregon
Date: March 5, 2005

Outline of Comments

- Benhabib-Eusepi use a fairly standard set-up in which they combine:

  Price stickiness + Monetary & fiscal policy rules + Capital and/or distortionary taxes + Perfect Foresight.

- Their main results:

  Local indeterminacy possible with active monetary policy.

  Local determinacy consistent with nearby oscillations.

  Policy can affect the existence of such solutions.

- Discussion: Perfect foresight is a very strong assumption. What would happen under adaptive learning?

Summary of the Model

- Sticky-price New Keynesian model (Rotemberg-Woodford stickiness)

- Contemporaneous monetary policy Taylor rule $R_t = \bar{R}\pi_t^{\phi_\pi}(Y_t/\bar{Y})^{\phi_y}$, with $\phi_\pi > 1$. The implied target is $\pi^* = 1$. In most of the paper $\phi_y = 0$.

- (a) Either capital is included in the model

  (b) Or government bonds are financed via distortionary income taxes τ_t.

- If (b) either (i) a constant bond rule or (ii) the Leeper rule is followed, i.e.

$$\tau_t Y_t - \bar{g} = (\frac{R_{t-1}}{\pi_t} - 1)\frac{B_{t-1}}{P_{t-1}} \text{ or } \tau_t Y_t - \bar{g} = \phi_0 + \phi_1 R_{t-1}\frac{B_{t-1}}{P_{t-1}}.$$

Main Results

- "Active" monetary policy (with $\phi_\pi > \beta^{-1}$) can have a range of ϕ_π that gives local indeterminacy (multiplicity). This was known to be possible for forward looking policies but seems new for contemporaneous rules.

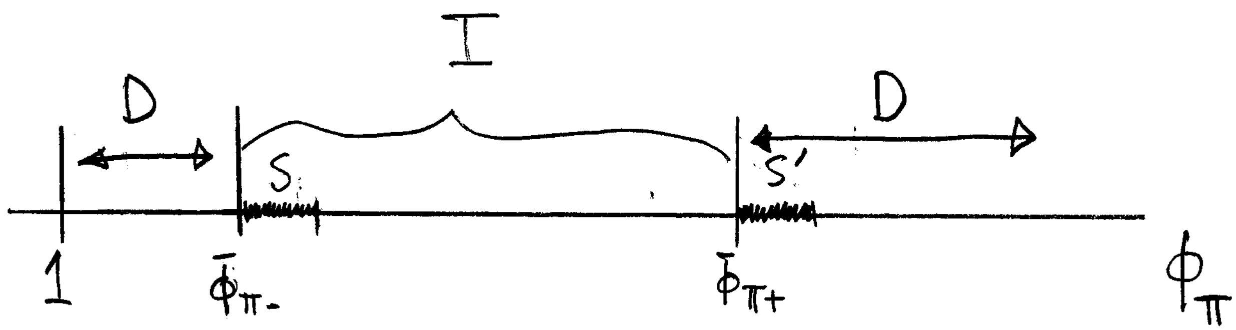
- Local determinacy (and indeterminacy) can coexist with global indeterminacy, taking the form of invariant closed curves (stable oscillations).

- This global indeterminacy does not rely on the "zero lower bound" for net interest rates. These are local bifurcation results and the fluctuations are near the targeted steady state.

- Policy parameters can affect the existence of these oscillatory solutions.

Model with Capital

(Prop. 1)



S : existence of "determinate" invariant curve

S' : existence of "indeterminate" invariant closed curve.

Calibration with $0.77 < \alpha < 0.84$

Intuition

- Recall that for a univariate model

$$x_t = \alpha x^e_{t+1}$$

  we have determinacy if $|\alpha| < 1$ and indeterminacy if $|\alpha| > 1$.
  Here we have a predetermined variable too, so multidimensional.

- Benhabib-Eusepi model with bonds. Approximately,

$$\pi_t = \beta \pi^e_{t+1} + \xi s_t, \text{ where } s_t = \text{real MC including taxes.}$$

  Then $\uparrow \pi^e_{t+1} \longrightarrow \uparrow \pi_t \longrightarrow \uparrow R_t/\pi_t \longrightarrow \downarrow Y_t, s_t$ but also
  $\uparrow R_t \longrightarrow \uparrow \tau_{t+1}, s_{t+1} \longrightarrow \uparrow \pi_{t+1}$ and possible indeterminacy.

- Nonlinearities in "Phillips curve" crucial for possibility of stable oscillations.

Principal Comments

- **Very** interesting results. They show the need to pay careful attention to multiplicities and nonlinearities in the analysis of New Keynesian models.

- Because most results are based on numerically calibrated models, their generality is not clear.

- The results also (in my opinion) indicate the importance of investigating the stability under learning of the different solutions (see below).

Some Specific Comments

- They don't worry about the ZLB multiplicity issue despite its prominence in earlier work by Benhabib et. al.
  In general the analysis is nonlocal more than global.

- The propositions concern calibrated models and are sometimes very specific numerically. How general are the results?

- E.g. maybe the usefulness of $\uparrow \phi_y$ is very sensitive to other parameters.

- The bond rule with $\phi_1 > 1$ is implausible: this policy would more than fully pay off debt in one period.

- They choose $R(\pi_t, Y_t)$ but $R(\pi^e_{t+1}, Y^e_{t+1}, Y_{t-1}, \ldots)$ may be needed to implement "optimal" policy in a way that is stable under learning (Evans-Honkapohja, REStud, 2003 & JMCB, 2003).
  And CBs do seem to use forward-looking rules.

- Is it possible to obtain (truly) global determinacy results under some policies, e.g. for ϕ_π large?

- Will the results based on the nonlinearity carry over to Calvo pricing?

General Comments on Learning

- Stability under adaptive (e.g. least squares) learning is important in New Keynesian models. Sometimes plausible interest rate rules under RE lead to instability under learning. (Evans-Honkapohja, REStud 2003).

- Local determinacy and local stability under learning are not the same. For example the "cobweb" model

$$x_t = \mu + \alpha x_t^e + v_t,$$

$v_t = \rho v_{t-1} + \varepsilon_t, |\rho| < 1$, is always determinate (if $\alpha \neq 1$), but the unique REE is not stable under LS learning if $\alpha > 1$. Similarly, for the model,

$$x_t = \mu + \alpha x_{t+1}^e + v_t$$

if $\alpha < -1$ and $0 \leq \rho < 1$ the solution $x_t = \bar{a} + \bar{b} v_t$ is stable under learning even though the model is indeterminate.

- Stability of cycles and sunspot solutions (SSEs) can also be examined, Woodford, Ecta (1990), EH, JET (1994, 2003). For example in the model

$$x_t = E_t^* F(x_{t+1}),$$

near a fixed point $\bar{x} = F(\bar{x})$ there exist SSEs if $|F'(\bar{x})| > 1$. These are not stable under adaptive learning if $F'(\bar{x}) > 1$ but can be stable under learning if $F'(\bar{x}) < -1$.

- For stability of "common factor" SSEs in linearized NK models

$$\mathbf{x}_t = \mathbf{B}\mathbf{x}_{t+1}^e + \mathbf{D}\mathbf{x}_{t-1} + \mathbf{v}_t,$$

see E & McGough, JEDC (forthcoming). Also H & Mitra, JME, 2004. On learning and the liquidity trap see EH, RED (forthcoming), Bullard & Cho, JEDC (forthcoming), McCallum (2002), Eusepi (2002).

Learning (continued)

- The omission of learning is the current paper is not really a criticism. Their focus is squarely on existence of "global" indeterminacy.

- And Stefano has looked at the stability of learning of cycles and SSEs in a related, forward-looking flex-price model without capital, "Forecast-based vs. backward-looking Taylor rules: a 'global' analysis".

- And they do have a tantalizing footnote about future work ....

Conclusions

- This is a provocative paper because it shows that indeterminacies in the New Keynesian framework are a potentially more serious problem than had been recognized.

- The possibility of perfect foresight invariant curves near the steady state – and even near a locally determinate steady state – is particularly startling.

- It is particularly intriguing for those of us working on learning because of the additional possibilities that need to be studied.