

MONETARY POLICY IN A GLOBAL RECESSION

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Any opinions expressed here are mine and do not necessarily reflect those of other Federal Open Market Committee members.

RESEARCH AND POLICY

- Take this opportunity to try to merge:
 - ① Some frontier research ...
 - ② ... with some pressing policy problems associated with the current crisis.
- We cannot solve all these problems today.
- But good research ideas can help us think about pragmatic policy options.

GLOBAL RECESSION

- We are in a sharp recession in the U.S. and globally.
- Global aspects unprecedented in the postwar era.
- Financial market turmoil continuing.
- Macroeconomic expectations unsettled, fluid.
- Suggests many possible outcomes.
- The global policy response may be critical.

NEAR-ZERO NOMINAL INTEREST RATE POLICIES

- The Federal Reserve moved the U.S. policy rate close to zero in December 2008.
- ECB lowering rates.
- Bank of England moving closer to zero.
- Bank of Japan near zero.
- Global zero interest rate policy?

MONETARIST EXPERIMENTS, THEN AND NOW

- Taylor rule calling for -6% U.S. nominal interest rate (!)
- To keep stabilization policy active requires a shift in thinking.
- Previous similar shift in thinking: Volcker 1979.
- More emphasis on monetary quantities.
 - 1979: A choice to implement policy in a way that would get inflation under control.
 - 2008: Thrust upon the Fed by events.
- But what is the nature of this new policy?

INTELLECTUALLY UNPREPARED

- Volcker's monetarist experiment won the early 1980s battle against inflation.
- 1980s monetary theory referred always to money.
- Two intellectual developments since then have left the economics profession largely unprepared for current circumstances.
 - Kydland, Prescott, Lucas: allow the economy to optimally react to shocks. Don't worry too much about business cycles. Monetary policy 'over-emphasized.'
 - Rotemberg, Woodford, Taylor: to the extent we can use monetary stabilization policy effectively, interest rate rules are a sensible tool.
- Result: With ZIRP ...
 - ... *stabilization policy runs aground intellectually.*

QUANTITATIVE EASING

- Near-zero policy rates have led to much discussion of “quantitative easing.”
- Goals for this address:
 - Try to offer some clarity and perspective on these issues.
 - Prepare for the coming era of near-zero policy rates globally.
- Themes:
 - 1 Little *intrinsic* difference between nominal interest rate targeting and monetary targeting.
 - 2 Avoiding deflationary trap dynamics may depend on fiscal policy.
 - 3 Global aspects of policy coordination: what to think?

A BENCHMARK MODEL

- Because of *ZIRP*, there is currently a lot of discussion about quantitatively-based monetary policy.
- But since Taylor (1993), the discussion has moved the other way, toward interest rate rules.
 - “Rationalizing what central banks already do.”
- Thrust of that discussion: one does not have to refer to money when implementing monetary policy.
- To think about this:
 - Consider the basic model from Woodford (2003, *Interest and Prices*, Princeton University Press).
 - Think of short-term nominal interest rates as being low, but not zero.

MONETARY IMPLEMENTATION

- Within the NK model, any desired stabilization policy could be implemented via either interest rate movements or movements in the stock of money.
- At some level, this has to be true.
- *Meaning:*
 - We do not *have to* implement via money ...
 - ... or even refer to money ...
 - ... but we *can* implement via money if desired.
- This is an important concept in the current environment.
- Why desired now? Consider:
 - Christiano, Motto and Rostagno (2004) – “The Great Depression and the Friedman Schwartz hypothesis”: a monetary base rule would have avoided the depression.

“M” AND MONETARY POLICY IN THE NK MODEL

- Many have looked for a role for money in the NK framework.
- In the basic NK model, it is not *necessary* to make reference to money.
 - Many arguments about this.
- But even in the basic NK model, you *can* pursue stabilization policy via movements in the money stock.
- In normal times, you may not want to do this.
- In extraordinary times, you may want to turn to this option.
- This is what is happening now in central bank policy worldwide.

A CONCEPTUAL QUESTION

- The NK model consists of four equations.
- A fourth equation describes the demand for money as a function of the nominal interest rate.
- It is a decoupled equation: It is not needed to find the equilibrium allocations in the economy.
- A question sometimes asked: is it not possible to invert the money demand equation, expressing the system in terms of a monetary rule instead, without reference to interest rates at all?
- Answer: It is possible, but the monetary rule is not like the ones normally studied in the earlier literature.

PRELIMINARIES

- Assume the inflation target is zero.
- Adopt Woodford's money-in-the-utility function specification.
- Assume that money does not pay interest.
- All variables are expressed as deviations from their steady state equilibrium or target values.
- There is no assumption concerning the zero bound: This is a local analysis for positive nominal interest rates.
- Think of nominal interest rates as being low but positive.

FOUR EQUATIONS

- Consider four equations:

$$x_t = E_t x_{t+1} - \sigma [r_t - E_t \pi_{t+1}] + \epsilon_{x,t} \quad (1)$$

$$\pi_t = \kappa x_t + \beta E_t \pi_{t+1} + \epsilon_{\pi,t} \quad (2)$$

$$r_t = \varphi_{\pi} \pi_t + \varphi_x x_t \quad (3)$$

$$m_t = \eta_x x_t - \eta_r r_t \quad (4)$$

- Equations (1) and (2) are standard.
- Equation (3) is an *ad hoc* Taylor rule with policy parameters φ_{π} and φ_x .
- Equation (4) is the money demand relation coming from the money-in-the-utility function specification.
- Normally, the money demand equation (4) is viewed as *decoupled*, and so ignored.

DETERMINACY

- Substituting equation (3) into equation (1) creates a two-dimensional system with determinacy condition

$$\varphi_{\pi} + \frac{1 - \beta}{\kappa} \varphi_x > 1. \quad (5)$$

- Equilibrium determinacy depends on policy parameter choices.
- Policy must be “aggressive enough” to prevent self-fulfilling fluctuations unrelated to fundamental shocks.
- We can choose optimal values for φ_{π} and φ_x subject to the determinacy condition.

AN ALTERNATIVE

- Throw out the Taylor rule, equation (3).
- Invert the money demand relation:

$$r_t = \frac{\eta_x x_t - m_t}{\eta_r} \quad (6)$$

- Substitute (6) into (1).
- Specify a money supply rule to replace the Taylor rule:

$$m_t = \mu_\pi \pi_t + \mu_x x_t \quad (7)$$

with new policy parameters μ_π and μ_x .

- Substitute (7) into (1). This creates a two-dimensional system, as before.

AN EQUIVALENCE

- The new system is two dimensional, with variables x_t and π_t .
- There is no reference to nominal interest rates.
- The new system is identical to the original one if

$$\eta_r \varphi_\pi = -\mu_\pi \quad (8)$$

$$\eta_r \varphi_x = \eta_x - \mu_x \quad (9)$$

- Since μ_π and μ_x are arbitrary policy parameters, we can always choose their values appropriately to meet these conditions.
- Appropriate choices means determinacy conditions are also met.
- We can optimize choices of μ_π and μ_x to obtain the optimal allocations given determinacy.
- From this perspective, there is little to choose between interest rate or monetary implementations.

REMARKS

- Feedback for money supply rules unusual.
- A monetary feedback rule can accomplish everything an interest rate rule can accomplish.
- It is still a rule. All issues about commitment and announcing policy paths are still relevant.
- Setting $\mu_\pi = \mu_x = 0$, “money does not matter,” may yield determinacy but would in general be far from the optimal policy.
- Switching to “quantitative monetary policy” at low nominal interest rates without thinking about issues like this may lead to policy errors.
- Objections to quantitative monetary policy are better couched in terms of practical considerations.
- In addition, interest rate rules have a clear problem—they can generate deflationary traps.

RECENT DATA

- Deflation is a real possibility in the current environment.
- A global recession that continues longer than currently anticipated could create a deflationary psychology.
- If this becomes entrenched, we could face an extended period of declining prices.
- We have the example of Japan.
- An important near-term goal for monetary policy is to prevent this outcome.

DEFLATIONARY TRAPS

- The Japanese experience spawned a literature.
- Benhabib, Schmitt-Grohe, and Uribe (2001, *JET*): “The perils of Taylor rules.”
- They combined the following features:
 - A Taylor-type policy rule which is ‘active.’
 - A zero bound on nominal interest rates.
 - A Fisher relation: $r_t = \rho + E_t\pi_{t+1}$.
- These features combine to produce a ‘second’ steady state away from the targeted steady state.
- This new steady state has inflation substantially below target and very low nominal interest rates.

THE RISK OF A DEFLATIONARY TRAP

- The Benhabib *et al.* story seems particularly relevant in the current environment.
- Policy rates are moving lower worldwide.
- A large, global shock.
- Why worry about deflation? Nominal contracting.

A COMFORTING RESULT

- One question to ask when there are multiple steady states is which steady state is stable under learning dynamics.
- Evans, Guse, and Honkapohja (2008, *EER*) did this analysis in a NK model.
- They show that the targeted steady state is locally stable, but not globally stable, in the learning dynamics.
- This is comforting.
- Still, a large shock could send the economy into what they call a deflationary spiral.
- How to prevent this?

AVOIDING DEFLATIONARY TRAPS

- One idea is to be particularly aggressive as interest rates are being lowered.
- Once inflation passes a certain threshold below the inflation target, then interest rates would be lowered to near zero rapidly.
- This policy does not really solve the problem.
 - It does enlarge the basin of attraction for the targeted steady state ...
 - ... by creating a new steady state still further from the targeted equilibrium.

AVOIDING DEFLATIONARY TRAPS: FISCAL POLICY

- Another idea is to pursue an aggressive fiscal policy.
- Inside the model, fiscal policy is passive in the sense of Leeper (1991).
 - An increase in real government debt is financed by lump-sum taxes.
- In this setting, an increase in government consumption can put a floor on inflation sufficient to keep the economy in the basin of attraction of the targeted steady state.
- Intriguing. Seems like the right type of analysis.

AVOIDING DEFLATIONARY TRAPS: EGH FIG. 1

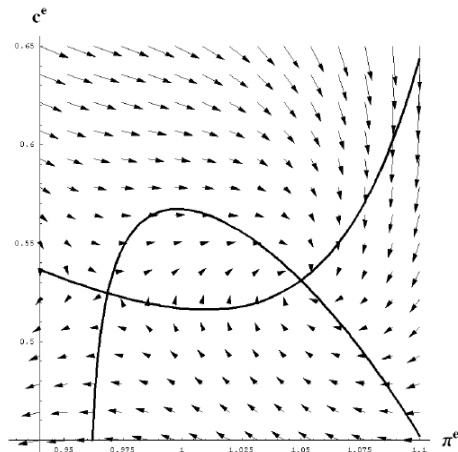


Figure 1: π^e and c^e dynamics under standard policy

AVOIDING DEFLATIONARY TRAPS: EGH FIG. 4

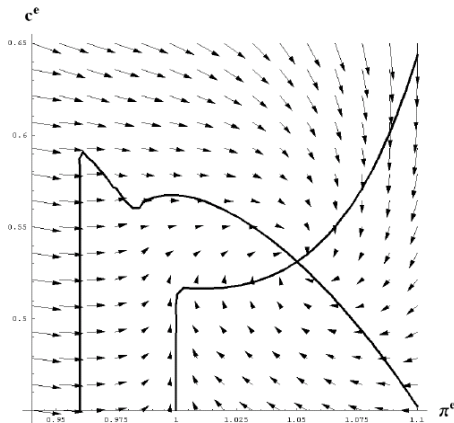


Figure 4: Inflation threshold $\pi_L < \tilde{\pi} < \pi^*$ for aggressive monetary and fiscal policies.

GLOBAL POLICY

- International policy coordination is of course difficult.
- For monetary policy, models are only recently available.
- Some literature suggests that gains from coordination may not be that large.
- Implication: don't worry about a lack of coordination.

COORDINATION FROM ANOTHER PERSPECTIVE

- Bullard and Singh (2008, *JME*).
- Multiple NK economies.
- Multiple policymakers following Taylor-type rules.
- Each country focuses on CPI inflation, which includes imported goods prices.
- Equilibrium is global.

MORE ON COORDINATION

- Determinacy conditions depend on policymakers worldwide.
- Indeterminacy of the worldwide equilibrium can be caused by a single policymaker.
- In this model, there does not appear to be much that remaining countries can do to fix the problem.
- If the country pursuing the poor policy is large ...
 - ... endogenous volatility could reverberate worldwide.
- Worrisome.

LESSONS ON COORDINATION

- The nature of worldwide equilibrium depends on the actions of all policymakers, especially major players.
- May be about more than a 'small gain' from proper coordination.
- More like: The structure of world equilibrium, the potential for endogenous volatility.
- Anther example: worldwide deflationary trap.
 - Multiple country versions of Benhabib *et al.*?

CONCLUSION

- New environment characterized by:
 - worldwide recession.
 - very low policy rates globally.
 - possible deflationary trap.
- Themes:
 - Quantitative approaches to policy are feasible.
 - Assessing deflationary trap potential requires a credible analysis of dynamics.
 - Coordination: may be more important than commonly recognized.

CONCLUSION

- Moving to quantitative approaches to policy is feasible and is going on right now.
 - We cannot lose sight of all of the other important lessons learned over the past 15 years.
 - Credibility, transparency, commitment remain important.
- A deflationary trap like Japan's is a clear near-term risk.
 - Possibly fiscal policy moves will help to avoid these dynamics.
 - Worldwide?
- International policy coordination.
 - Less to do with small additional utility gains.
 - More to do with the structure of the global equilibrium and the potential for endogenous volatility.