# MONETARY POLICY IN A GLOBAL RECESSION

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## RESEARCH AND POLICY

- Take this opportunity to try to merge:
  - Some frontier research ...
  - ... 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:
- Little *intrinisic* difference between nominal interest rate targeting and monetary targeting.
- Avoiding deflationary trap dynamics may depend on fiscal policy.
- Global aspects of policy coordination: what to think?

- 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.

- 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.

- 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.

- 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.

# Consider four equations:

$$x_t = E_t x_{t+1} - \sigma \left[ r_t - E_t \pi_{t+1} \right] + \epsilon_{x,t} \tag{1}$$

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

$$r_t = \varphi_{\pi} \pi_t + \varphi_x x_t \tag{3}$$

$$m_t = \eta_x x_t - \eta_r r_t \tag{4}$$

- Equations (1) and (2) are standard.
- Equation (3) is an *ad hoc* Taylor rule with policy parameters  $\varphi_{\pi}$  and  $\varphi_{x}$ .
- 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

$$\varphi_{\pi} + \frac{1 - \beta}{\kappa} \varphi_{\chi} > 1. \tag{5}$$

- 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  $\varphi_{\pi}$  and  $\varphi_{x}$  subject to the determinacy condition.

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

$$r_t = \frac{\eta_x x_t - m_t}{\eta_r} \tag{6}$$

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

$$m_t = \mu_\pi \pi_t + \mu_x x_t \tag{7}$$

with new policy parameters  $\mu_{\pi}$  and  $\mu_{x}$ .

• 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  $\pi_t$ .
- There is no reference to nominal interest rates.
- The new system is identical to the original one if

$$\eta_r \varphi_{\pi} = -\mu_{\pi} \tag{8}$$

$$\eta_r \varphi_x = \eta_x - \mu_x. \tag{9}$$

- Since  $\mu_{\pi}$  and  $\mu_{x}$  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  $\mu_{\pi}$  and  $\mu_{x}$  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.

- 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.

- 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 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

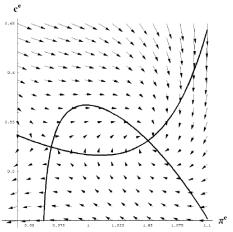


Figure 1:  $\pi^e$  and  $c^e$  dynamics under standard policy

# AVOIDING DEFLATIONARY TRAPS: EGH Fig. 4

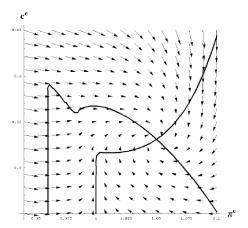


Figure 4: Inflation threshold  $\pi_L < \tilde{\pi} < \pi^*$  for aggressive monetary and fiscal policies.

## 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.

- 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.