Monetary and Macro-Prudential Policies: An Integrated Analysis

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What Should Monetary Policy Do?

- Lax monetary policy may have contributed to recent crisis
  - (Taylor 2009)
  - Interest in adding a macro-prudential component to monetary policy
- Monetary policy may not have contributed to crisis
  - Regulatory policy should remain main tool for financial stability
  - Monetary policy should focus on price/output stability (Svensson 2010)
- Contribution of this paper is to study these issues in a model with macroeconomic and financial stability objectives

Recent Literature

- Policies to address financial crises
  - ▶ Bianchi and Mendoza (2010), Jeanne and Korinek (2010) Benigno et. al. (2009,2011)
  - ▶ Real model with no role for traditional monetary policy
  - ▶ Focus is on financial friction
- New Keynesian literature on traditional monetary policy (Woodford 2003)
- We combine these two literatures

Model Overview

- Three period New Open Economy Macro version of Jeanne and Korinek (2010, AER PP)
  - Nominal friction gives rise to New Keynesian price stability objective
  - Occasionally binding borrowing constraint creates a financial stability objective
  - Borrowing constraint depends on asset value

Financial Crisis and Scope for Precautionary Policy

- Financial crisis is a borrowing constraint that binds
  - ▸ Crisis is an endogenous event
- There is a pecuniary externality that causes borrowing decisions to be inefficient in normal times

Key Questions

- Is there a tradeoff between macroecomic and financial stability?
    - ▶ Take an interest rate rule that addresses nominal rigidity
    - ▶ Apply rule in model with financial friction
- Can an 'adjusted' interest rate rule help?
    - ▶ Add borrowing to rule (implicit current account targeting)
    - ▶ Compare welfare

Main Results

- Welfare cost of the nominal rigidity is larger than the welfare cost of the financial friction
  - Recent literature finds small welfare gains with this financial friction
  - (Bianchi and Mendoza 2010 and Benigno et al. 2009, 2010, 2011)
- Macroprudential component appended to interest rate rule is welfare reducing
  - Same policy applies in good and bad times
  - Monetary policy should not be burdened with macroprudential objectives
- There is no trade off between macroeconomic and financial frictions
  - Conditional on model and parameterization

Outline of Talk

- Three period model
- Calibration and Solution
- Alternative rules
- Conclusion

Households

- Two countries, H (Home) and F (Foreign)
  - Home country is a small open economy
- Consumer receives utility from consumption in each of 3 periods
  - Consumption is a composite good of tradable and non-tradable goods
- Tradeable goods are a composite of home and foreign tradeables

Households

- The period t budget constraint for the home country:

$$Q_t A_{t+1} + P_t C_t + B_{t+1} + S_t B_{t+1}^* =$$

$$B_t (1 + i_0) + S_t B_t^*(1 + i_0^*) + A_t (D_t + Q_t) + W_t L_t + F_t$$

- The collateral constraints are expressed as limits on foreign borrowing:

$$S_t B_{t+1}^* \geq -\psi Q_t A_{t+1}$$

Firms

- Two-sector production economy (tradeable and non-tradeable goods).
- Domestic agents hold shares in home firms.
- Firms in the tradables sector operate in a monopolistic competitive environment
  - Only some firms can adjust prices in periods 0 and 1.
  - In period 2 prices are fully flexible for all firms.
- Firms in the non-tradables sector operate under decreasing return to scale in a competitive environment.

Monetary Policy

- Traditional monetary policy is a pure inflation targeting rule:

$$(1 + i_t) = \beta \bar{\Pi} \left(\frac{\Pi_t^H}{\bar{\Pi}} \right)^{\phi_\pi}, \tag{1}$$

- The macroprudential component adds the level of borrowing to GDP

$$(1 + i_t) = \beta \bar{\Pi} \left(\frac{\Pi_t}{\bar{\Pi}} \right)^{\phi_\pi} \left(1 - \frac{S_t B_{t+1}^*}{P_t C_t} \right)^{\phi_{B^*}} \tag{2}$$

  ▸ Raises the nominal interest rate as borrowing increases
  ▸ This acts as a tax on borrowing (macro prudential intervention)

Calibration

- Tradeable sector technology shock is a two-state Markov process
    - crisis probability=probability of remaining in bad states
    - but, debt and crisis are endogenous
- Frequency of adjusting prices is 50 percent
- The rule coefficient is $\phi_\pi = 1.5$ or 2
- The borrowing parameter ψ is set,
    - so the constraint is never binding in period 0
    - and so that the constraint might bind if the economy remains in the bad state in period 1 (a value of 2.5).
    - thus the financial friction is a leverage constraint that limits foreign currency denominated borrowing in period 1 to 2.5 times the value of collateral in nominal terms
- Solution is fully nonlinear

Flexible Prices: With and Without Leverage Constraint

- Welfare and Consumption higher without the constraint
    - ▶ If bad state occurs in Period 1 constrained economy cannot smooth consumption
- Exchange rate has an expansionary expenditure switching effect and a contractionary balance sheet effect
- Both Nominal and Real exchange rates are more depreciated in constrained economy
    - ▶ Debt repayment is front loaded
    - ▶ Increase exports yielding a larger current account surplus

Sticky and Flexible Prices: With and Without Leverage Constraint

- Sticky prices have lower welfare costs than collateral constraint
  - ▶ Distortion caused by sticky prices larger than financial friction
  - ▶ Consumption is lower in sticky price world
  - ▶ Financial friction only binds occasionally
  - ▶ 50 percent of firms are constrained

More Aggressive Inflation Targeting

- Increase inflation coefficient from 1.5 to 2 in interest rate rule
  - ▶ Main variables move towards flexible price allocation
- No trade off between monetary and financial stability
- Conventional monetary policy has a macroprudential component
  - ▶ A more aggressive rule towards inflation reduces debt
  - ▶ There are two channels through which higher interest rate affects borrowing decision
    - ★ Dampening asset price value
    - ★ Appreciate exchange rate so increases borrowing capacity

Macro Prudential Rule

- Add Debt/GDP ratio to rule
  - ▶ As debt rises, raises the interest rate to curtail borrowing
- Welfare is lower relative to rule with only inflation
  - ▶ Rule applies in every period
  - ▶ Prudential component distorts economy in all periods and states
  - ▶ Conventional rule already has some macro-prudential implications via asset prices

Main Results

- Built an integrated model to study interaction between monetary and financial stability objective
- Preliminary analysis suggests that there is not a strong case for tasking interest rate rule with macro-prduential objectives
- We plan to investigate robustness of results
- Study two part rules and state contingent rules