"Managing Capital Flows in the Presence of External Risks"

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Summary

- International borrowing affects the value of domestic capital
  - consumption smoothing vs. risk of sudden stops
- Sudden stops: forced deleveraging because of suddenly binding borrowing constraints
- Optimal capital controls when faced with different sources of risk

Setting

- Homogenous agents with preferences

$$\mathbb{E}\left[\sum_{t=0}^{\infty}\beta^t u(c_t)\right]$$

- Lucas tree produces risky output d_t; only held domestically
- Incomplete markets: short-term risk-free bonds
- Borrowing constraint: $-\frac{b_{t+1}}{R_t} \leq \kappa q_t s_{t+1}$
- 3 shocks:
  - output d_t
  - interest rate R_t
  - volatility of R_t

Market incompleteness

- Agents cannot share risk with foreign lenders; there's only a short-run risk-free bond
- Why can't they trade bonds of different maturity?
  - e.g. the value of a fixed rate bond will go down when R goes up
- This seems of first order importance when
  - sharing interest rate risk: should we "lock in" a low rate?
  - dealing with sudden stops: long-term bonds mitigate them
- Governments and private agents do think a lot about this

Model with market incompleteness

- Forget about the borrowing constraint for now
- Let $\{c_t^*, b_t^*\}$ be the solution to this problem, and q_t^* the equilibrium price of the tree
- It seems the equilibrium is constrained efficient. Is this correct?
- But once we include the borrowing constraint, it might be binding

$$-\frac{b_{t+1}^*}{R_t} > \kappa q_t^*$$

Tax/subsidy on capital

- We can use a tax on capital income τ^k to eliminate the borrowing constraint
- We want $q_t = \hat{q}_t = \frac{-b^*_{t+1}}{R_t \kappa}$ so the borrowing constraint is not binding

$$\hat{q}_t = \beta \mathbb{E}_t \left[\frac{u'(c^*_{t+1})}{u'(c^*_t)} (\hat{q}_{t+1} + d_{t+1})(1 - \tau^k) \right]$$

  and rebate it lump-sum to agents
- The price of capital doesn't play any allocative role
  - if we add investment then there is an interesting tradeoff
  - elastic supply of capital: $q_t = 1$?
- General principle: if the problem is that the price of capital appears in the borrowing constraint, then pick an instrument that affects the price of capital and as few other things as possible

Sudden stops

- If borrowing constraint becomes binding today $\Longrightarrow$ forced deleveraging $c_t \downarrow \Longrightarrow$ lower asset prices $q_t \Longrightarrow$ even tighter constraint

- Forced deleveraging could be avoided by long-term debt?

- If private agents could choose the maturity of their debt, would the planner choose to intervene here?

Capital controls

- The policy instrument in the paper is to restrict foreign borrowing b

$$u'(c_t) - \mu_t = \beta R_t \mathbb{E}_t \left[u'(c_{t+1}) + \kappa \mu_{t+1} \frac{\partial q_{t+1}}{\partial b_{t+1}} + \mu_t \kappa R_t \frac{\partial q_t}{\partial b_{t+1}} \right]$$

- Higher $b_{t+1} \implies$ lower $q_{t+1} \implies$ tighter constraint $t+1$

- Higher $b_{t+1} \implies$ higher $q_t \implies$ relaxed constraint t

- Two forces:
  - how tight are constraints μ_t
  - how big is the effect of capital controls on the price of capital q_t.

Shocks to interest rates

- High interest rate: households want to borrow less on their own, so the constraints are less likely to bind
  - $\Longrightarrow$ smaller intervention

- High volatility of interest rates:
  - more likely to hit constraints $\Longrightarrow$ intervene more
  - sensitivity of price of capital lower $\Longrightarrow$ intervene less

Conclusions

- Are capital controls the right policy instrument?

- Maturity of debt is central when dealing with
  - a) sudden stops
  - b) interest rate risk