Bianchi: Overborrowing

ECON4335 The Economics of Banking

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Part 1

Presentation of Javier Bianchi: Overborrowing and systemic externalities in the business cycle, AER December 2011

Background

Bianchi (2011) AER: Overborrowing and systemic externalities in the business cycle

- Sudden stops:
  - Capital inflow suddenly turns around
  - Current account deficit turns to surplus
  - Boom turns to deep recession
  - Example: Asian crisis 1997-98, Greece, Portugal, Spain
- RBC-model
  - Technology shocks
  - Consumption smoothing
  - CA surplus in booms, deficits in recession

Bianchi's explanation

- Incomplete markets, only safe bond, no insurance
- Moral hazard, difficulty collecting debt payments
- Lenders limit borrowing relative to income
- Consumers sometimes borrow up to the limit
- If a bad shock hits, the limit is reduced and consumers forced to save
- Increased saving reduces the price of non-traded goods $\rightarrow$Even lower limit
- Overborrowing: One person's borrowing contribute to reduce the limit for all

The model

Consumers maximize

$$\mathbb{E}_0 \left\{ \sum_0^\infty \beta^t u(c_t) \right\} \tag{1}$$

where
$0 < \beta < 1$
$u'(c_t) > 0,\ u''(c_t) < 0, u'''(c_t) > 0$
$c_t = w(c_t^T, c_t^N)$, where v is homogeneous of degree 1
Impatience, risk aversion precaution

Constraints

Budget

$$b_{t+1} + c_t^T + p_t^N c_t^N = b_t(1+r) + y_t^T + p_t^N y_t^N \tag{2}$$

Borrowing

$$b_{t+1} \geq -\kappa \left(y_t^T + p_t^N y_t^N \right) \tag{3}$$

$\beta(1+r) < 1$ Assumption: Impatience beats real interest rate
Debt limited relative to income

Shocks

$$\begin{aligned} \ln y_t^T &= \rho_{11} \ln y_{t-1}^T + \rho_{12} \ln y_{t-1}^N + \varepsilon_t^T \\ \ln y_t^N &= \rho_{21} \ln y_{t-1}^T + \rho_{22} \ln y_{t-1}^N + \varepsilon_t^N \end{aligned}$$

Calibration: $\rho_{11} = 0.9$, $\rho_{22} = 0.2$, time unit one year

Optimality conditions

Intertemporal condition

$$\text{Either} \quad b_{t+1} > -\kappa\left(y_t^T + p_t^N y_t^N\right) \quad \text{and} \quad \frac{\partial u}{\partial c_t^T} = \beta(1+r)\mathbb{E}_t \frac{\partial u}{\partial c_{t+1}^T} \tag{4}$$

$$\text{or} \quad b_{t+1} = -\kappa\left(y_t^T + \kappa^N p_t^N y_t^N\right) \quad \text{and} \quad \frac{\partial u}{\partial c_t^T} \geq \beta(1+r)\mathbb{E}_t \frac{\partial u}{\partial c_{t+1}^T} \tag{5}$$

Intratemporal condition

$$\frac{w_2'(c_t^T, c_t^N)}{w_1'(c_t^T, c_t^N)} = p_t^N$$

Budget constraint

$$b_{t+1} + c_t^T + p_t^N c_t^N = b_t(1+r) + y_t^T + p_t^N y_t^N$$

The intratemporal condition

$$\frac{w_2'(c_t^T, c_t^N)}{w_1'(c_t^T, c_t^N)} = p_t^N$$

Because of homogeneity:

$$\frac{w_2'(c_t^T, c_t^N)}{w_1'(c_t^T, c_t^N)} = \frac{w_2'(1, c_t^N/c_t^T)}{w_1'(1, c_t^N/c_t^T)} = p_t^N$$

With constant elasticity of substitution, $1/(\eta+1) > 0$:

$$\left(\frac{c_t^T}{c_t^N}\right)^{(1+\eta)} = p_t^N \Longleftrightarrow c_t^N = c_t^T \left(p_t^N\right)^{-1/(1+\eta)} \tag{6}$$

Equilibrium

Condition

$$c_t^N = y_t^N \tag{7}$$

Hence:

$$p_t^N = \left(\frac{c_t^T}{y_t^N} \right)^{(1+\eta)}$$

$$b_{t+1} \geq -\kappa \left(y_t^T + p_t^N y_t^N \right) = -\kappa \left[y_t^T + \left(y_t^N \right)^{-\eta} \left(c_t^T \right)^{1+\eta} \right]$$

- More consumption raises borrowing limit of everybody

Some intuition

- Impatience $\beta < 1$: Consume early, acquire debt up to limit
- Risk aversion $u'' < 0$: Smooth consumption, save in good times, use in bad times
- Precaution $u''' > 0$: Better to save too much than too little, save early. if bad luck, rebuild.
- Credit constraint
  - Prevents full consumption smoothing
  - Activates precautionary saving with infinite horizon
- Graphs will be shown

Policy conclusion

- Tax debt to internalize externality, even if it is a pecuniary externality

Alternative views on sudden stops

- Model can produce sudden stops
- What was the technology shock that hit Thailand?
- How come that so many other Asian countries were hit?
- Simpler explanation: It started with a loss of confidence in the fixed parities to dollar.
- Domestic investors had borrowed in dollars financing investment boom in non-traded industries
- Foreign investors had lent in bath.
- Panic resulted when parity questioned
- Policy conclusion: Capital controls to limit inflows of hot money

Relevance for banking

- No bank in model, no defaults
- Too much debt is bad! or
- Living too close to borrrowing constraint = Danger!
- Main lesson: Amplifying of negative shocks