Discussion of "A Model of Moral-Hazard Credit Cycles"

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The paper

- Moral hazard in investment
  - bankers pick projects, face moral hazard
- Bankers live n periods, $1 < n < \infty$
- Investors sign optimal long term contract with bankers
  - investment cycles emerge in equilibrium
  - may be suboptimal for the "workers" who cannot invest

Simple version of the model

- Two technologies
  - simple risk-free saving with rate $(1+\rho)$
  - sophisticated with return $F(K, L)$
- A banker is needed to deliver investment K into sophisticated technology
  - no effort of banker is needed
  - banker can run away with capital before investing
- OLG bankers live for two periods, young and old.
- Risk neutral, have discount factor $(1+\rho)^{-1}$.

Optimal contract

- Optimal static contract
  - Pay $b \geq K$ to banker if he makes an investment
  - Return on investment $\frac{1}{1+\rho} F(K, L) - b$
- Optimal dynamic contact
  - Postpone paying b by one period with interest
  - Pay $(1 + \rho)\, b$ in period 2 if banker also makes investment $K^o \leq (1 + \rho)\, b$
  - If investors promise b to banker when old
    - banker invests $\frac{1}{1+\rho} b$ when young
    - banker invests b when old

Putting everything into a model

- Consumers have utility $c - v(L)$
- Discount factor $(1 + \rho)^{-1}$
- Treat them as if infinitely lived
    - in the paper they also OLG
    - do not think it matters

Social Planner's problem

- Planner solves

$$\max \sum_{t=0}^{\infty} \left(\frac{1}{1+\rho}\right)^{t} \left[c_t - v(L_t)\right]$$

s.t.

$$K_{1,t+1} + K_{2,t+1} + c_t + b_t \leq F(K_{1,t}, L_t) + (1+\rho) K_{2,t}$$

$$h_t^o + h_t^y \geq K_{1,t}$$

$$b_t \geq h_t^o$$

$$b_t \geq (1+\rho) h_{t-1}^y$$

$$b_0 \text{ is given}$$

- Last constraint: implicit promised made to the initial old bankers
  - key for understanding cycles

Cycles

- First order conditions

$$1 = \left(\frac{1}{1+\rho}\right) F_K(t+1) - \mu_t$$

- Using other FOCs can show

$$\mu_{t+1} = 1 - \mu_t$$

- Thus, μ_t follows a cycles
- Initial multiplier μ_0 is pinned down by b_0 promised to the initial old banker
  - there is unique b_0 leadings to constant investments
  - any other b_0 lead to cycles
- Conjecture: same cycles emerge with aggregate shocks for any b_0

Intuition

- Suppose hired a lot of young bankers yesterday $\Longrightarrow$ b_0 is high
- Today they all work for free $\Longrightarrow$ invest a lot, need to hire few young bankers
- Tomorrow there are few old bankers working for free $\Longrightarrow$ need to hire more costly young bankers
- Since overall investment is more costly tomorrow, investment tomorrow is low
- Day after tomorrow the cycle repeats itself

Time consistency

- Cycles are a generic property of the solution
  - cycles also Pareto efficient
- What if we could choose b_0?
  - set $b_0 = 0$
  - it is always better to hire young banker since tomorrow he will work for free
- The biggest cycle of all seems the most efficient
- It also lies in the background of some of the policy experiments in the paper

Welfare

- The paper focuses on welfare of workers

$$F_L(K_t, L_t)L_t - v(L_t)$$

  - ignore bankers
- Considers OLG workers
  - cycles are Pareto efficient
  - elimination of cycles may be desirable if focus on average welfare

Conclusion

- Fascinating paper
- Optimal contracts naturally lead to cycles
  - examples in the paper: slow growth, then sudden crash
- Not sure about applications to the financial crisis in Japan and the US