Discussion of "僵尸企业、信贷错配与宏观系统风险——一个内生波动的理论视角" by 许志伟、董丰

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Brief Summary

- introduces a theoretical framework to study zombie firms, bank credit/borrowing via interbank market, and macro-financial stability

- relative to voluminous works on the empirics of zombie firms, a model with very rich implications (and delivers elegant analytical solutions)

  1. study the exact distortions that drive banks to lend to zombie firms
  2. interactions of zombie lending and instability of interbank market
  3. oscillation between high-efficiency and low-efficiency equilibria
  4. laboratory to examine the effectiveness of subsidy policy that survives zombie firms, industrial policy that promotes tech upgrading

- Importantly, it features the "dynamics of interbank market": cost of bank funding helps define the productivity cut-off for banks to lend to productive firms vs. zombie firms

  - avoids the mess of micro-structure for firm-bank search-match
  - recall Stiglitz-Weiss (1981, AER)

Model Overview

- static model followed by extension to parametrized dynamic model

1. Firm producers
   a. Heterogeneous productive (normal) firms (h): $y_h = A_h(zk_h)^{\alpha} n_h^{1-\alpha}$, idio productivity $z \in [z_{min}, z_{max}]$ follows Pareto distribution; capital income $\pi_h z k_h$
   b. Representative zombie firm sector (l): $y_l = A_l k_l$ with gov's output (per unit of capital) subsidy $(1+\tau)A_l$, i.e. the required cost of borrowing
      - MPK: $A_l < \alpha A_h z_{max}^{\alpha} K^{\alpha-1}$, capital of both type financed via bank credit
2. Banking sector
   - risk neutral and optimality: firm's MPK $= R(z)$, marginal cost of incurring bank loan (interest rate, i.e. linear financing cost)
   - source of bank funding: (1) equity ξK ; (2) inter-bank loan market of amount $\lambda \xi K$
   - choices: (1) loan to h; (2) loan to l; (3) loan to interbank market

Inspecting the Key Mechanism

- critical distortions in the model

  1. On zombie firm sector (firm producers)

     - output subsidy per capital: $(1+\tau)A_l$

  2. On banking sector

     - interbank market (moral hazard): loan bank cannot observe borrower bank's asset quality z, $R^f \geq (1+\tau)A_l$
     - (gain 1 from lending to zombie) bank lending to zombie if funded via interbank only pays partial cost $(1+\tau)A_l \leq R^f$
     - (gain 2) gov's subsidy to lending to zombie firm:

$$\theta \cdot \underbrace{(1+\tau)A_l}_{\text{rate charge on zombie}} \cdot \underbrace{\lambda\xi K}_{\text{quantity of lending}}$$

     - $R(z) = \max\{\pi_h z(1+\lambda) - R^f\lambda, (1+\tau)(1+\lambda\theta)A_l, R^f\}$

Key Implications

- IC constraint: $R^f \geq (1+\tau)(1+\theta\lambda)A_l \Rightarrow$ ensure functioning of interbank market $\Rightarrow$ prevents massive lending to zombie for subsidized return

1. "indifference" (binding IC) gives $R^f \uparrow$, $\tau \downarrow$, $\theta \downarrow$, $A_l \downarrow \Rightarrow$ leverage $\lambda \uparrow$

2. bank lending cutoff rule: lend to firms only if $z \geq z^* = \frac{R^f}{\pi_h}$, otherwise lend to other banks with R^f

3. Aggregation: $\int_{z \geq z^*} \lambda \xi K dF(z) = \int_{z < z^*} \xi K dF(z)$ [demand = supply (of bank credit)]

$$(1 - F(z^*))\lambda = F(z^*) \tag{1}$$

determines z^*, interbank rate R^f, leverage λ, size of total bank financing/firm borrowing, output

4. RHS increasing in z^* but LHS curvature over z^* range $\Rightarrow$ indeterminacy, unique or duo equilibria $\Rightarrow$ source of instability

5. What matters for LHS? θ, τ, (though also on ξ) $\Rightarrow$ leads to policy analysis

Comments

- A very interesting paper with super rich/elegant results

- determinancy condition holds $\Rightarrow$ absence of zombie firm sector (high-efficiency eq.)

- indeterminancy (due to much higher subsidies θ, τ) $\Rightarrow$ shutdown of interbank market $\Rightarrow$ unique equilibrium of co-existence of productive and zombie firm sectors (low-efficiency eq. , only τ matters for z^*)

- increasing zombie subsidies τ pushes originally high-efficiency eq to low-efficiency eq

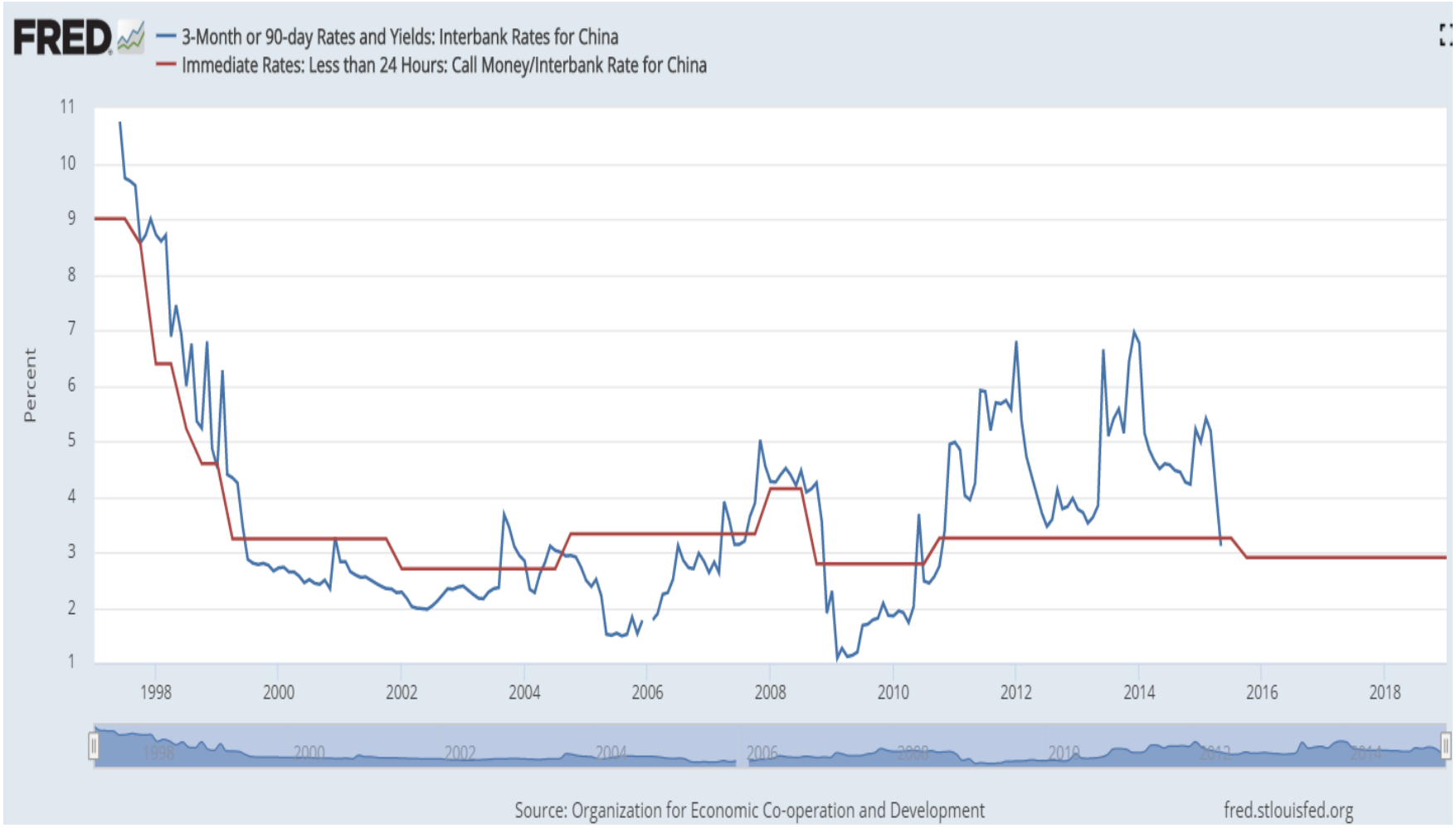
- lower A_h, negative technology shocks trigger structural equilibrium downgrade

Additional Comments

- transition dynamics? static model and the extended dynamic model (more of a comparative statics flavor), welfare cost and business cycle properties along with equilibrium shifts? propagation only via capital accumulation, other temporary shocks?
- labor supply is inelastic. potential reallocation of labor across zombie and non-zombie sectors and within productive sectors? coupled with credit (mis-or pro-) allocation?
- Banking sector: pass-through of zombie firm's revenue onto its own balance sheet, zombie firms size driven by bank credit only. other channels, unemployment concern, industrial policy, local government protections?
- interactions of interbank market and size of zombie sector?

Interbank Market Vibrancy and Rates

- Does it mean when R^f is relatively low, more credits pushed towards risk-taking? Or, the reverse



Notes: FRED St. Louis

Additional Comments

- alternative scenario to consider: risk-averse banks and cost of financing more influenced by monetary/credit policy $\Rightarrow$ determination of optimal "size" rather than rate of bank credit?
- too much capital or too much "mis-allocated" capital? $K_t > K_t^*$, low efficiency equilibrium kicks-in
- oscillation issue: endogenous recovery? K_t falls from high efficiency eq to low eq but returns?
- selection of the two equilibria conditional on interbank market functioning
- regulatory arbitrage: R^f shocks and risk-taking of zombie lending

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- regulatory arbitrage: R^f shocks and risk-taking of zombie lending
- uniquely beautiful theory framework to study Chinese firms and macro policy, truly inspiring

Thank You Very Much