

Lack of Debt Restructuring and Lender's Credibility - A Theory of Nonperforming Loans by Kobayashi, Nakajima and Takahashi

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Summary

- This paper studies how a lengthy debt restructuring process can create nonperforming loans and lead to a persistent inefficiency.
- The model features two-sided lack of commitment.
 - ▶ The loss of lender's credibility discourages the borrower's demand for new loans.
- The model generates a debt Laffer curve.
 - ▶ The lender's payoff may decrease with the contractual amount of debt.
- Debt restructuring can improve efficiency of equilibrium.

Contribution

- Build on **Albuquerque and Hopenhayn (2004)** .
 - ▶ AH: State-contingent debt. One-sided lack of commitment. Constrained efficient allocation with backloading payoff to the borrower.
 - ▶ Here: Non state-contingent debt. Two-sided lack of commitment. Debt restructuring is restricted.
- If the debt is accumulated beyond a threshold level, the lender becomes unable to commit itself to any future repayment plans.

Key Mechanism

- Nonperforming loan: D_t too large to be repaid

- ▶ Lender's problem

$$d(s, D) = \max_{b, k, V, D_{+1}} b + \beta \mathbb{E}d(s_{+1}, D_{+1})$$

$$\text{subject to } F(s, k) - Rk - b + \beta \mathbb{E}V(s_{+1}, D_{+1}) \geq G(s, k)$$

$$F(s, k) - Rk - b \geq 0$$

$$D_{t+1} = (1 + r)(D_t - b_t)$$

where $V(s, D) = F(s, k(s, D)) - Rk(s, D) - b(s, D) + \beta \mathbb{E}V(s_{+1}, D_{+1})$

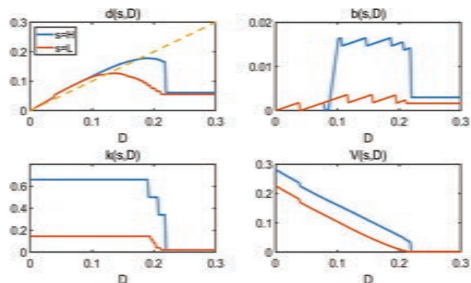
- ▶ Nonperforming Loan Equilibrium: D_t is not a state variable for $D_t \geq \bar{D}$

Comment 1: Implementation of the optimal contract

- The main difference between this paper and AH is non state-contingent contract
- The interpretation of the state-contingency
 - ▶ Here the debt contract is long term contract with interest rate r
 - ▶ Yet the debt repayment is the solution to the lender's problem. $b(s, D)$.
 - ▶ The repayment on debt lower than \bar{D} is state contingent.
 - ▶ Only constrained in changing the contracted debt level D_t .
- The implementation of the dynamic contract solved in the model

Comment 1: Implementation of the optimal contract

- Numerical example of the model solution.



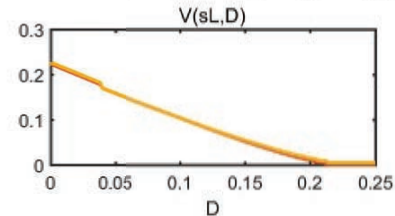
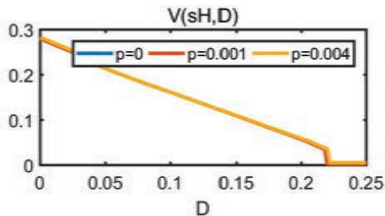
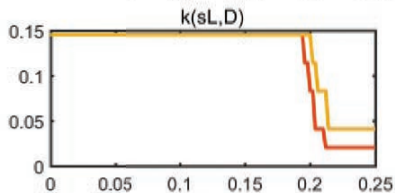
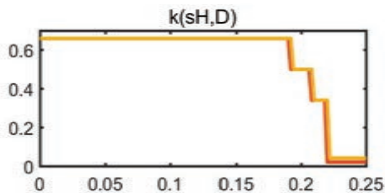
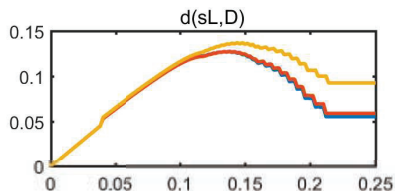
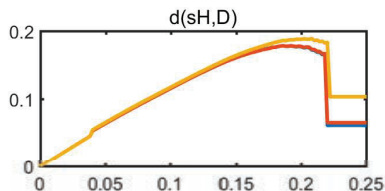
Benchmark case with no debt restructuring

- Based on the parameterization $r = 0.05$.
- Debt restructuring on the debt repayment?

Comment 2: Application on Debt Restructuring

- Parameterize the prob of the debt restructuring.
- Calculate the debt hair cut rate.
- Simulate the model to examine the dynamics of debt, repayment, working capital, and output.
- Quantitative analysis helps to study how empirically plausible the model is.

Comment 2: Application on Debt Restructuring



Comment 3: Working Capital

- The timing of debt repayment/default and working capital
 - ▶ Borrower accepts the offer on $\{b_{t+j}, k_{t+j}\}_{j=0}^{\infty}$ and then can default.
 - ▶ Working capital loan is received.
 - ▶ Debt repayment is paid
- How does the timing of the default affect the model solution?
- The provision of bank loan and working capital loan in reality.

Comment 4: Policy Implication

- The empirical evidence on nonperforming loans.
- China's case: nonperforming loans and zombie firms.
- The determination of initial debt position or financial standing.
- The productivity of nonviable firms
- Policy implication regarding nonperforming loans and zombie firms.

Conclusion

- Interesting and important work