A Simple Model of a Credit Market with Moral Hazard

Seminar XI

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Assumptions

Suppose there are firms seeking to finance a project of (normalized) size 1. The riskless interest rate is 0.

The firms can choose between two investments (technology): A *good* technology gives $G > 0$ with probability $\pi_G \in (0, 1)$ and zero otherwise, and a *bad* technology which gives $B > 0$ with probability $\pi_B \in (0, 1)$. Assume that only the good technology has positive NPV, $\pi_G G > 1 > \pi_B B$, but $B > G$ which implies $\pi_G > \pi_B$.

Success of investment is verifiable by outsider but not the technology used nor the returns.

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Firm promises to repay $R > 0$ in case of success.

Crucial element to show: The nominal indebtness R determines the firm's choice of technology

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which implies

$$R < R_C = \frac{\pi_G G - \pi_B B}{\pi_G - \pi_B}$$

with R_C the critical value of R above which the firm decides to adopt the bad technology.

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Therefore, in equilibrium, since $\pi_B R < 1$ for $R \leq B$, if there exists an equilibrium it will imply that the firm has chosen good technology.

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$\Rightarrow$ No trade, the credit market collapses because good technology project cannot be financed and bad technology ones have negative NPV.

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  In other words, the monitoring cost must be lower than the NPV of the good project.

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Under these conditions banks will appear in equilibrium for intermediate probability values

$$\pi_G \in \left[\frac{C+1}{G}; \frac{1}{R_C} \right]$$

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- If $\pi_G \in \left[\frac{C+1}{G}; \frac{1}{R_C}\right]$, firms borrow at rate $R_2 = (C+1)/\pi_G$
- If $\pi_G < (C+1)/G$, no trade, the credit market collapses.