Chapter 7: Adverse Selection and Financing

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November 2008

Financing Under Asymmetric Information

- Empirical evidence that securities are issued under asymmetric information:
- (i) Between issuers and investors
  Firm's prospects or asset worth might be unknown to investors
  Are they purchasing overvalued claims?
  Good borrowers are unable to distinguish themselves from bad ones, possibly leading to market breakdown (Akerlof, 1970)
- (ii) Between investors
  Investor offering the highest price might be overvaluing the financial securities (winner's curse)
- Here concentrate in the first!

Model

- Assume same model as before (and $A = 0$)
- Now private benefit B is private information: B_L or B_H ($B_H > B_L > 0$)
- Only agent knows private benefits. Lender only has some prior probability α that is B_L (good firm) and $1 - \alpha$ that is B_H (bad firm)
- Remember that with full information about B, project financed if and only if

$$R_b \geq \frac{B}{\Delta p} \quad \text{and} \quad p_H \left(R - \frac{B}{\Delta p} \right) \geq I$$

- Assume that

$$p_H \left(R - \frac{B_H}{\Delta p} \right) < I < p_H \left(R - \frac{B_L}{\Delta p} \right)$$

- That is, under full info about B, project would only be funded if $B = B_L$

Credit Analysis

- An (unknown) agent offers again the following contract to the lender(s): Noboy gets nothing if failure and R_l and R_b in case of success

- (i) If $R_b \geq \frac{B_H}{\Delta p}$ agent works no matter if she has high or low benefits. Lender does not finance because she gets,

$$p_H (R - R_b) - I \leq p_H \left(R - \frac{B_H}{\Delta p} \right) - I < 0$$

- (ii) If $R_b < \frac{B_L}{\Delta p}$ agent does not work whatever her private benefits and no funding is obtained

Credit Analysis (2)

- (iii) Suppose that

$$\frac{B_L}{\Delta p} \leq R_b < \frac{B_H}{\Delta p}$$

- Good type works and bad type shirks. Funding iff

$$\left[\alpha p_H + (1-\alpha)p_L\right](R - R_b) \geq I$$

- Higher α more likely to get funded (e.g. if $\alpha = 1$, yes and if $\alpha = 0$, not)

Credit Analysis (3)

- In terms of α: define α^* as α such that this is exactly satisfied, i.e.

$$[\alpha^* p_H + (1-\alpha^*)p_L]\left(R - \frac{B_L}{\Delta p}\right) = I,$$

- Then, we have that

  (i) If $\alpha < \alpha^*$ there is no funding

  (ii) If $\alpha > \alpha^*$ there is funding. Agent offers R_b^* such that

$$[\alpha p_H + (1-\alpha)p_L]\,(R - R_b^*) = I$$

  Good agent works and the financing condition is satisfied

Conclusion

- If probability that agent is bad sufficiently high, market breaks down
- If probability is sufficiently low, no market breakdown and more lending than under symmetric information
- Both types of agent gets funded with the same contract (pooling)
- Externality between types of agents. Good type gets

$$R_b^* = R - \frac{I}{\alpha p_H + (1-\alpha) p_L} < R - \frac{I}{p_H}$$

while bad agent gets financed while she wouldn't under symmetric information

- Conditional on funding, the NPV is now

$$[\alpha p_H + (1 - \alpha) p_L]\, R - I < p_H R - I$$

Thus quality of lending is affected by asymmetric information

- This is called the lemons problem! (first applied to second hand cars)