EC476 Part IV
Class 5

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Les Mannes Frères, a bank with fixed liabilities, builds a loan book today that will payoff tomorrow when the value of its equity will be $\Pi \in \{\Pi_L, \Pi_H\}$, where $\Pi_L < 0 < \Pi_H$. The bank has limited liability and will default if $\Pi = \Pi_L$, in which case the management files Chapter 7 and bears bankruptcy/default costs $D < -\Pi_L$.

Les Mannes exerts ex ante effort e that determines the probability of "success" according to

$$\mathbb{P}\left[\Pi = \Pi_H \,\middle|\, e\right] = e \tag{1}$$

at the cost

$$c(e) = \frac{1}{2}\,e^2. \tag{2}$$

The banks operations create a social surplus S in addition to its profits that society forfeits if it shuts; as a result, the government is investigating bailout policies with which to address financial emergencies.

As usual suppose throughout that parameters are such that the first-order approach is valid.

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1. (a) Provide an interpretation for the bankruptcy costs D.

   (b) Describe some banking activities captured by the ex ante effort e.

   (c) As in the lecture notes, Π might include ex post costs ω. What banking activities would ω capture?

   (d) Discuss with examples the social value S. Do you think S is positive?

2. (a) If there is no possibility of a bailout, find the bank's equilibrium effort e^* by maximizing

$$\mathbb{E}\left[\Pi \,\middle|\, e\right] - c(e) = e\Pi_H - (1-e)D - \frac{1}{2}e^2. \tag{3}$$

   (b) Compute the (ex ante) social cost of bank failure.

3. (a) What size bailout B should the Government give the bank? Find the lower bound S_{min} on the social surplus for a bailout to be optimal ex post.

   Suppose $S > S_{\text{min}}$ from now on.

   (b) Find the equilibrium effort e_{BO} that the bank will exert if it anticipates being bailed out by maximizing

$$\mathbb{E}\left[\max\{\Pi, 0\} \,\middle|\, e\right] - \frac{1}{2}e^2. \tag{4}$$

   (c) Show that $e_{\text{BO}} < e^*$. Comment.

   (d) Compute the social cost of bank failure. Comment relative to the world with no bailouts.

4. Suppose now that the Government has the power to commit to a probability q of saving troubled banks.

(a) Find the equilibrium effort e_q that a bank exerts if it knows it will be bailed out with probability exactly q should it fail by maximizing

$$e\Pi_H - (1-e)(1-q)D - \frac{1}{2}e^2. \tag{5}$$

(b) Show that $e_{\mathrm{BO}} \leq e_q \leq e^*$.

(c) Find the social cost of bank failures as a function of q.

(d) Find the optimal probability of a bailout q^*.

5. Comment on why you think the Federal Reserve/Bush Administration bailed out AIG and not Lehman Brothers in the light of the exercise.