

Problem set 1: Seminars – ECON 4335 Economics of Banking
February 9 & 11 – 2010 (week 6)

1. Give a brief survey, without presenting formal models, how moral hazard might affect, on the one hand a direct finance-relationship, and, on the other hand, a bank finance-relationship. (You may benefit from reading Diamond (1996).)
2. In the model by Diamond & Dybvig presented at the first lecture, you are asked to answer the following questions:
 - Explain why a system with banks offering optimal deposit contracts when bonds are traded at a price, $p = \frac{1}{R}$, cannot survive as a Nash equilibrium. (The notation as in the book.)
 - In the book it is demonstrated that a banking system offering deposit contracts, while keeping reserves equal to expected withdrawals in the unfavourable state, $\pi_1 C_1^*$, can implement the optimal allocation if beliefs or anticipations about the solvency of the bank is “favourable”. What will then be the liquidated value of a bank’s assets under a bank run, when the liquidation cost per unit long-term investment is $1 - \lambda$?
 - Suppose a new regulation is imposed requiring that the banking system, whatsoever, should be able to meet their contractual obligations. How would you interpret such a requirement?

(You may, if you want, solve the entire model with $u(c) = \frac{c^{1-\gamma}}{1-\gamma}$; and with $\gamma > 1$.)
3. Consider a financial contracting problem with a monopolistic lender – a bank – providing a borrowing firm with a loan. The loan is to be used to buy new equipment (with price set equal to one). Let the size of the loan be k . We let the amount being repaid after one period be denoted t . The bank’s payoff is given by $V = t - (1 + r)k$, when financing the loan is done in an international market at the given rate of interest r .
 The borrower’s payoff function is $U = sf(k) - t$, where $f(k)$ is a neoclassical production function; with $f'(k) > 0$, $f''(k) < 0$. The parameter s is private information (observed only by the firm) and can be interpreted as a type-parameter or as a productivity shock, with $s \in \{\underline{s}, \bar{s}\}$, and $\Pr(s = \underline{s}) = p$ for being a low-type, and $\Pr(s = \bar{s}) = 1 - p$ for being a high-type; $\bar{s} > \underline{s} > 0$. (This probability distribution is common knowledge.) Assume that the bank’s objective is to maximize expected profits. However, the lender cannot distinguish between the two types. A borrower will not accept a financial contract offering her a negative payoff.

- a) What would be the lender's optimal contract under complete and symmetric information; as given by a pair $\{t, k\}$, one for each type of the borrower?
- b) When only the borrower knows his true type, as given by the value of s , show that if the contract from a) above should be offered, then a \bar{s} -firm would pretend to be a low-type firm.
- c) How can the lender, by properly designing the set of contracts, induce the high-type to choose the contract designed for it?