

**Solutions to Exercises in
Economics of Banking
Chapter 6**

1. We have here a situation with two types of borrowers, a topic which is discussed in Sections 4 and 5. Although it is possible in principle for the lender to observe types, it may still be reasonable to try to separate the types by suitably tailored offers consisting of interest rate plus collateral.

It is expected that a brief sketch is given of the basic model of pricing under these circumstances. If there is competition among banks, there can only be equilibrium in the market under suitable additional conditions which should be indicated graphically.

2. The situation described is discussed in Sections 4 and 5 of this chapter. It can be assumed that loans of type 1 are more risky than loans of type 2. Loan contracts are characterized by the combination of interest and collateral, and the bank can separate the two buyer groups, even when type cannot be observed directly, by offering two loan contracts, a contract with high interest and no collateral for type 1, and for type 2 a contract with lower interest and so much collateral that type 1 is not tempted to take it. A more detailed description of the market will also state that contracts are robust against potential competitors who may try to establish themselves in the market by attracting one or both types of borrowers.

When the value for the lender of the collateral is reduced, there is a need for higher collateral at every given level of interest, so that contracts involving collateral must be revised so that either interest rate or collateral increases, making them less attractive for the borrower. For contracts not involving collateral there is no immediate change in the background conditions. Under the assumption that the export industries are type 1 this means that argument (1) is not well-founded.

However, argument (2) may turn out to be correct, since the policy measure reduces the difference between the two customer types from the point of view of the lender. This may have as consequence that a competitor who could not offer both types a (pooling) contract before, can do it now, so that the previous equilibrium is upset without no obvious new candidate for an equilibrium.

3. We are dealing with credit rationing as described in the beginning of this chapter. The situation outlined points to the Stiglitz-Weiss model for adverse selection, where the less risky projects are squeezed out as the repayment rate increases, so that only risky projects remain, something which may result in reduced expected profits for the the bank. Other models may be used as well, provided that arguments are given for their use.

The proposals for improvement depend on the model selected. If Stiglitz-Weiss is used, it is important to attract less risky projects, and one of the ways in which adverse selection

can be avoided is by changing the standard contract to loan contracts including an upside, a provision securing that the bank will get a share of very large gains. This will make it possible to reduce the repayment rate and thereby keep some projects with low risk.

4. From the description of the situation, it can be inferred that there are two types of potential borrowers, namely the experienced entrepreneurs and the newcomers. A relevant theoretical background may then be either the moral hazard model of Chapter 5, Section 4, or the adverse selection model of Section 5 of this chapter, and since there is no costly effort involved on the side of the borrowers, the latter model seems to be most proper one. The credit policy must in this case follow the principles outlined in Section 4, operating with a collateral combined with a rather small interest rate as one alternative, and a high interest rate and no collateral contract as the other alternative, so that with the right size of interest rates and collaterals the two types of borrowers will choose the contracts intended for them.

It the bank must face competition from other banks, the equilibrium with a system of contracts described above may be upset if a competitor can propose one single contract to both types which both would prefer and with which the competitors would not lose money (this may not always be the case). If so, there is no simple way in which a new equilibrium in the market could be established, since the alternative contract proposed by the competitor would immediately be attacked by other competitors offering one of the types a better contract, and the market will be characterized by instability.

5. We have here a moral hazard problem of the type described in Chapter 1 and again in this chapter. Since the bank cannot control the investment decision of the borrower, the latter will choose the investment which gives the highest expected profit, and since nothing is paid in the case of failure, this will give incentives towards a more risky investment than what is socially desirable. If the loan rate is set high, the investors will prefer high-risk investments, and expected repayment to the bank will be too small to cover the funding cost, so that the bank will be reluctant to engage in new credit arrangements.

A loan contract where the payoff of the investment, which can be observed by both parties, is shared between lender and borrower, may reduce the problem, since it reduces the gains to the investor from choosing high-risk investments.