Week 10
Credit rationing and collateral

We almost finished chapter 4 on market risk, what remains is only application of the CAPM model to capital rationing, and this is not a long story. After this, we turn to the discussion of another of our main topics, namely that of credit rationing, the credit market paradox where people willing to pay whatever in terms of repayment in order to obtain credits but still cannot get it. As mentioned in the handout for last week, a straightforward explanation, which could be taken out of an economics textbook, would be that supply is backward-bending, so that it never reaches the demand curve, and therefore the market cannot clear in a standard way. This may be so, but then one needs an explanation of backward bended supply, and here one points to downward sloping relationship between nominal and expected interest rates.

We present three explanations of this phenomenon, namely (1) adverse selection (the Stiglitz-Weiss model), (2) costly monitoring, and (3) moral hazard. Each of the three give the explanation we are looking for, and there may be others as well.

The Stiglitz-Weiss model is one of adverse selection. All investors have projects which give the same mean but they differ in riskiness, it is assumed that they are ordered according to second-order stochastic dominance (one prospect dominates another if every risk averse investor would prefer it to the other one). In this setup, increasing interest rates give rise to adverse selection in the sense that the less risky prospects are not taken up, only the risky remain, which in its course may lead to a decrease in expected repayment. The S-W model does not say that backward bending supply occurs always, only that it can occur. The Stiglitz-Weiss model is fairly intuitive – the repayment rate restricts the demand for credits to projects which are sufficiently risky (the entrepreneur keeps the gains when it goes well and doesn’t pay when it goes wrong, and consequently higher repayment rate increases the risk and eventually reduces expected repayment. We also take a brief look at the formalism behind the intuition; it is somewhat involved, and you don’t need to memorize it, but it may be reassuring to see that the intuitive ideas can be formulated in a precise way. Subsection 6.2.2, which shows that the repayment must increase again at high levels of $R$, is mainly for nerds, so we skip this subsection.

The explanations (2) and (3) are simpler and also give some partial explanation of backward-bendedness.

Having spent some energy on the S-W model (which is a classic), we also consider
a variation over the same theme, namely the model by de Meza and Webb, which gives the opposite conclusion, namely that there will be an oversupply of credits for investment, at least compared with what is desirable for society. Although the models look similar, at a closer look they are not, and together the two models may be used as a first approach towards classifying investment projects into different types, where the market will allow too many of some and too few of others. The formal part is not particularly tough, and it is useful for the understanding of why we get the oversupply result.

After our discussion of the de Meza-Webb model we proceed to a (renewed) discussion of the role of collateral. The first model, due to Bester, treats a case of two different types of borrowers, where combinations of repayment rate and collateral can be used to separate the types. The analysis is graphical, and the crucial part is to place the point $A$ in the diagram. Pay close attention to the curves in the figure, the arguments use these curves intensively. Having done than, the rest follows reasonably easy. There is a fundamental problem with this type of models, namely that the equilibrium described does not always exist (depends on the curves, look at the two figures). There is little we can do at this point, this is a general problem with models of adverse selections.

The reason for discussing the Bester model at this point almost slips the mind, but the point is that using collateral as an additional instrument one can avoid rationing. However, this result depends rather crucially on the market regime. To see this, we look briefly into the following section, where the model treats almost the same situation but with a single profit-maximizing bank. Here the credit rationing is explicit (it did not show up in the Bester model), since the bank may decide on the proportion of each type which should have credits.

It is not surprising that collateral is not used in the case of full information, where the bank chooses rates to extract maximal surplus and declines credit if it does not pay. But somewhat surprisingly, collateral is again not used when we assume asymmetric information. We skip all details since the main point is that there is more to the use of collateral than what is shown in the Bester model.

We read: Chapter 6 except 6.2.2, section 6.5 only in outline.