Lecture 7:
Credit rationing (continued); Market risk

In the previpus lecture, we considered the Stiglitz-Weiss model of adverse se-lection and just started up on the model by de Meza and Webb, a variation over the same theme but with the opposite conclusion. The investment projects considered are slightly different, the outcomes are fixed both when success and when failure, and potential investors differ in their probability of success. If banks provide credits whenever their profits are nonzero, then too many projects are offered credits, in the sense that some of these projects have negative profit from the point of view of society (even if not from the point of view of the investor), so that there will be an oversupply of credits for investment compared to 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.

The explanations (2) and (3) above are simpler and also give some partial expla-nation of backward-bendedness. We discussed the moral hazard story (3) already in the last lecture, and (2) is again straightforward, it consists in writing down the formula for expected profit under the standard contract and then analysing its graph.

After this we proceed to a (renewed) discussion of the role of collateral. The 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. This point represents a contract which is zero-expected-profit for the bank no matter the type of the borrower – indeed, the collateral is such that in any case the bank will get the loan back with interest, and zero-profit means that the repayment of this risk-free asset must be the risk-free rate repayment.

Pay close attention to the curves in the figure, the arguments use these curves intensively. Given the curves, 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, and it points to the need for a more sophisticated way of modelling such phenomena.

The reason for discussing the Bester model at this point is that using collateral as

an additional instrument one may avoid credit rationing. This does not mean that collateral is the only way of getting around the rationing problem (and the deMeza-Webb model showed that rationing may even be desirable in some cases), but it is certainly much used in practice, and, as we see, for good reasons. It should of course be added that the zero profit condition is somewhat peculiar, and if we drop it, some of the results may look differently.

This is what the last section of the chapter is about. Here we work also with a profit maximizing bank, and the bank may use combinations of credit rationing and collateral rather than only one of these alternatives. We skip this section which is not in the curriculum, but a few of the points are still worth mentioningr.

We then turn back to the chapter on *market risk,* which is the risk connected with value of assets or liabilities having a price in the market (so in principle, interest risk is also market risk, but it is always treated separately). This is a rather long chapter, but we read only the sections 1 and 5, not because the rest is unimportant, it is actively used in practice, but it fits better for practical exercises than for lecturing.

We begin with a short discussion of the pricing of assets, much of it probably known already, covering today only the capital-asset princing model (CAPM). We consider only the parts of the CAPM which take only what is relevant to us, namely the so-called two-fund separation – all investors hold portfolios of risky assets which are proportional. This is reasonably easy to derive, so previous knowledge of CAPM is unnecessary. We then put it to some use, investigating the relevance of capital ratios.

After the introduction, there are two sections dealing with the methods actually used in assessing market risk, with focus on VaR and ETL. We skip these sections, not because they are unimportant, which is definitely not the case, but because risk assessment is something which has to be learned by doing it rather than reading about it, and this is beyond our scope in this course. So we go directly to Section 5 where we are back in the CAPM. Here we consider a bank which deals only with asset management holding portfolios, and we ask whether capital ratios (ratio of equity and suitably (risk-)weighted assets) are relevant as indicators of default risk. The answer is (not very surprisingly) yes, at least as long as the capital ratios are only measures, not constraints on the portfolio choices of the bank.

We read:

Chapter 6, sections 3 and 4. Chapter 4, sections 1 and 5.