Lecture 19: Closing the Bank II, Capital regulation

In the models of Chapter 17 considered so far, it turned out that in many situations where a bank should have been closed, it is nevertheless allowed to carry on. This happened due to the cost connected with closing a bank (liquidity cost etc.). But there is another – and much more straightforward – reason that banks are assisted when they get into trouble, namely the consequences of a bank failure for the economic activity in society in general, and if the bank has sufficiently large impact on the economy, it cannot be allowed to close down. It is “too big to fail”, and if the bank knows this to be the case, it opens up new possibilities for risk-taking.

Section 17.5 deals with such problems, but it also shows that theory has not yet been slow in catching up on what has happened during and after the financial crises. Here are some comments on what is in the section for those specifically interested; anyway, the section is not in the curriculum so you may choose to skip it.

The Acharya-Yorulmazor model of Section 5 resembles a model that we have considered earlier in the context of deposit insurance: Banks may or may not choose correlated investments, and the regulator may or may not assist them in the case of trouble. However, the choices of the banks depend on the fact that they may be bailed out, so the resulting equilibrium may be one where banks are assisted more often than what is desirable for society. When coordinating investments, the banks have become systemically important. The message of the model is important, but the details are not, so we treat it only superficially (meaning as usual that it will not show up at exam).

The problem of SIFIs (systemically important financial institutions) is sufficiently important in practice, so that it has been taken up both by Basel and by national regulations. It is however not quite easy to measure systemically importance, and to some extent it is not even clear what is meant by it. The final part of Section 17.5 is an attempt to measure the systemic influence of a bank, something which is not as straightforward as one might think. Here – and in most of theoretical models about systemic importance – the problem is reduced a problem of correlation of assets, perhaps not exactly what one wants to capture by the idea of systemic importance.

This takes us to the final Chapter 18 on capital regulation and the Basel rules. Capital regulation has been with us almost from Chapter 1, so by now there can be few surprises. The idea that bank owners (shareholders) must participate in the risks taken by the bank instead of risking exclusively borrowed money is so intuitive that it seems to need no explanation, and indeed this was our approach in all the previous chapters. In this final chapter, dealing exactly with capital regulation, we shall take a more balanced view of the phenomenon. Indeed, some of the models considered in
the chapter will show that under certain circumstances a stricter capital regulation may have results which are the opposite of what was to be expected. This can look as academic subtleties, and to some extent it is. However, the role of theoretical analysis to point to what can happen, and we search here for possible side effects just as we have been doing when considering deposit insurance and bailing out of banks.

The first of the two models pointing to adverse effects of capital regulation, that of Allen, Carletti and Marquez, is such that the bank itself chooses a higher capital ratio with no regulation than it would do if regulated. This is of course somewhat conclusion, and one would suspect that the model has some rather peculiar features, as indeed it has. In the beginning all is quite standard, the bank chooses both its capital ratio and the risk level of its investment, and it is disciplined by the depositors since the deposit rate depends on the risk. But on the loan side things are slightly unusual, either the bank is owned by the borrowers or there is strong competition for borrowers, in any case the bank chooses the loan rate (and risk level) so as to maximize borrower profits. This determines an equilibrium capital ratio without any need for a regulator.

When the regulator steps in, the capital ration will be determined from social welfare considerations, in the primitive setup of the model this means that it should maximize borrower profits plus bank profits, and for suitable parameter values this optimal capital ratio may be lower than the ratio found in the equilibrium without a regulator. This looks of course rather strange, it happened since the regulator forced the bank to pay more attention to its own profits than it would have done in the market (where it was subject to strong competition for borrowers).

Notice, by the way, that in the model we have introduced a cost of equity to the bank, presumably some kind of opportunity cost, reflecting what the shareholders could have obtained elsewhere, and in most cases this cost is assumed to be higher than the cost of borrowed funds. This gives rise to some trouble with the Modigliani-Miller theorem saying that the value of the firm is independent of the proportion of equity in total capital, but again this probably corresponds to intuition and practical reasoning.

The Hakenes-Schnabel model in 18.1.3 uses the Allen-Gale model (in the Boyd-deNicoló version) from Chapter 11, and its purpose is to show that increasing the capital ratio can result in a more risky (understood in a particular way) investment policy of the bank rather than the converse which was to be expected.

The model is not quite easy to follow for several reasons. In the Allen-Gale world, investments either succeed or fail, and if they fail then everything is lost. If the model is to be used for tracing the effects of changes in the capital ratio, it should matter for the bank how much will be lost in the case of failure, and therefore the Allen-Gale setup is modified: There are two types of investments, either (uncorrelated) in a sector with many small firms or (correlated) in a sector with one big firm, all have the same
payoff and probability of success. The bank (for some reason not explained) chooses a mixed strategy for investment, that is it chooses the probability of investing in the first (uncorrelated) sector. If it has invested in the uncorrelated sector, then by the law of large numbers, a share \( p(s) \) of the firms will succeed and yield \( p \), and the bank will survive, but with the correlated sector the bank will necessarily fail in the case that the investment fails.

Using another trick (a cost function of particular form connected with the choice of mixed strategy), the optimum will be interior (probability of uncorrelated investment > 0 and < 1), and a change in capital ratio will change this optimum, under suitable assumptions in such a way that the probability of uncorrelated investment decreases. Again, the model is somewhat peculiar so that the conclusions should be taken with a grain of salt, only indicating that increasing capital ratios has the opposite effect of what was the be expected. You should not feel obliged to go into details with the model.

The next section recapitulates Basel I and II and covers only what you more or less know already.

We read: Chapter 18, sections 1-2.