Week 11: Securitization, Credit Risk

Before embarking on new topics, we finish the discussion of credit rationing, where we had just started the discussion of the Bester model of adverse selection. Since the model it is a classic, we give it all the time it takes. We then turn to one of the central topics of recent years, securitization. The chapter contains a lot of material, which means that we run quickly through some of it in order to use more time on the rest.

The first section deals with the different techniques used in securitization, and it may be skimmed through quickly, the details are not needed for what follows. In Section 2, we mention the Gorton-Souleles model briefly, by now it has mainly historical interest, representing the optimistic pre-crisis viewpoint on securitization. After this, we go to the Shleifer-Vishny model in Section 2.2. Here we have a first case of what may be considered as the main problem of securitization, namely the instability which is caused by changes in value of underlying assets. Thus, securitization may aggravate the business cycles.

In the following Section 3, we return to shadow banking, which we introduced in Chapter 2. The model in this section can be seen as a continuation of the previous one, being however more explicit on the environment (shadow banks funding themselves by repo trades and issuing securities based on the loans). This means that the model becomes more involved, something which is difficult to avoid, and some care is needed to navigate. It is somewhat disappointing that the results of the model are not very sensational – the financial intermediaries may collapse if bad future events are consistently neglected, and therefore we read it only in broad outline (meaning that you don’t need to put up more effort than what is needed to have a basic idea of what is going on).

The next Section 4 again addresses a phenomenon which is interesting and relevant, but nevertheless we shall skip it, since there are so many other topics to be discussed. Ratings agencies are an important ingredient in the securitization process, and their performance up to the financial crisis was not too impressive, since they kept rating papers as AAA which turned out to be junk. The services of the rating agency are usually paid by the issuer of the securities, which gives rise to some doubts about their sincerity, together with the fact that they grossly overvalued securities before the 2008 crisis. Explaining this overrating is not altogether easy, and there are several possible approaches to this. We skip the section since an explanation of the overrating has mainly historical interest by now.

This takes us to Section 5 with the by now almost classical model by Kiyotaki and Moore in Section 6, where an asset (“real estate”) can be used both for productive
purposes and as collateral. This has as consequence that changes in asset prices have impact on the amount of credits granted and thereby on production of goods, and connected with the market for the services of real estate this will give rise to cyclical movements in prices (and production), so that it can explain the existence of business cycles. The relevance of the model has become even more obvious after the financial crises which was triggered by the development in house prices in the US.

The model in Section 6 deals with leverage. The leverage cycle model by Geanakoplos is simple but it has striking conclusions. If you can borrow money in order to buy a security, using this very security as collateral, then the prices of securities adapt, and in particular, when expectations change, the price changes may be quite large. So in the model, even slightly bad new may cause disturbances which results in defaults long before the adverse events happen, if they happen at all. We are not going into details (we have enough material in the chapter even so), keeping the discussion at the general level.

Having done with this chapter, we just mention another phenomenon in contemporary banking, namely islamic banks doing business without receiving interest payments. This is mentioned in the last section of chapter 9 on corporate finance, which we skip since it is marginal to our topic of financial intermediation (meaning that corporate finance interests us only to the extent that financial intermediaries get involved).

In our discussion of risk management we have now come to credit risk. We begin with a general discussion of the background for measuring credit risk (something that we have already discussed) and in particular the background for the emergence of many new methods for this measurement.

We then proceed to a discussion of the theoretical background for the credit risk models used in practice. These models are usually subdivided in two classes, namely structural models, attempting to explain defaults by events in the enterprises that have taken the loans, and reduced models, where defaults of borrowers are seen as random events much in the same ways as in loss insurance.

The structural models are based on the approach initiated by Merton, where loans are seen as the combination of two transactions, namely (1) the purchase by the bank of the assets of the firm and (2) giving the firm an option on buying back these assets (by paying back the loan). The value of the loan can then be found by assessing each of the two parts, that is the value of the assets of the firm and the value of the option. The section uses option pricing and the formalism may be somewhat tough. You are not supposed to memorize the formula, what matters is understanding basic principles of the Merton approach and the difference between this and the reduced model approach. We skip sections 3.2 and 3.3 which are not necessary for our purposes.

We then proceed to a short overview of the models used in practice, centered on four prototype models for modelling credit risks in banks. Also here the details
of the commercial credit risk models are of second importance, but it is worthwhile noticing the differences: KMV and CreditMetrics use the structural approach, the last one with reliance on a Markov model using ratings, while the two others use a reduced form approach, the first one through a Poisson-type model and the second using econometric formulations.

There is a final section in the chapter dealing with consumer credit risk, which is treated in its own way, here the main problem is whether to accept or reject a new customer. I leave it to possible individual reading, it is not in the curriculum.

**We read:** Chapter 8 minus Sections 2.1 and 4. Sections 3 and 6 are read only in outline. Chapter 7 except sections 3.2 and 3.3.