**Week 12: Credit Risk, Payments**

We managed only to start our discussion of credit risk, so here is once more what was written in the handout for last week:

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.

Another unfulfilled promise of last week was Islamic banking, which I mention briefly.

Having done with credit risk, we move to what was the main topic of this week, payments. Payments are important for financial institutions, and that in several respects. We skip the first sections, which means that we do not touch upon the interbank payments, which is a whole topic of its own, and where the central banks play an important role. However, we shall go into some detail with the third section on credit card payments, where we treat the by now classical model by Rochet and Tirole.

On the face of it, the model seems not to focus on banking but rather on the role of credit cards in competition among retail sellers, but it is closely enough related to our main themes, and it does merit some attention. We are here dealing with a case of two-sided markets with a specific platform (the particular credit card), and this
situation occurs in many different situations, in particular since we are witnessing increasing competition among platforms, in the sense that payments can be carried through using by now traditional means such as bank account transfers and credit cards, but also using the new electronic currencies, whether public or issued by a central bank.

This takes us to the final pages of Chapter 10 in the book, which has a short mention of cryptocurrencies, witnessing the fast development of this field, even since the book was written, since nowadays one would need to consider the underlying blockchain technology and its potentials. I shall mention this in the lecture (possibly only next week) and supplement the book with a brief note (which is not mandatory).

We read: Chapter 7 (see the handout for week 11) and Section 10.3.