Lecture 2:
More about core competences of banks

We proceed from where we stopped on Monday, dealing with cases where financial intermediation has a role to play in society, all of them connected with asymmetric information in some form.

Delegated Monitoring. In this story, we have a number m of consumer-investors, as always endowed with one unit of money. There are n of firms in which to invest, and the outcome of firm j is random. Investors have to monitor their investment at a cost, so that if each investor has to monitor all firms, this amounts to quite a sum of money.

The cost can be reduced if a middleman is introduced, but upon a closer look we realize that one problem has been replaced by another one: How can the investors be sure that the monitoring agent does the job instead of just reporting back that everything is ok?

What is needed is an arrangement giving the agent the right incentives. It almost suggests itself since we are dealing with banks – we let the monitoring agent open a bank, taking the investments as deposits which are the paid back with a deposit interest rate, and investing the deposits in the firms. The bank is assumed to maximize profits, and it will definitely monitor the firms.

Only one small detail remains: it may happen that the firms obtain results which taken together are too small to pay the deposits back with interest. Then the bank defaults, and the depositors get whatever the firms delivered. Moreover, there is a cost (to lawyers etc.) of processing the default. Does this possibility of default upset the promising result?

The answer is – as one might well guess – that if there are enough firms, then actual performance will be very close to the average, and therefore the arrangement will work and save money for the investors.

As a by-product of our story, we have introduced the idea of *costly monitoring*, which will be used on many occasions in the following.

Moral hazard: This model is again one which will be used repeatedly. In the present context, where we construct cases for financial intermediation, it ends up using the same main argument as the previous model, namely monitoring, but the model is a useful workhorse in many context, and this is the reason that we use some time on it.

In the model, there is an entrepreneur who wants to borrow money for an investment project. For the time being, think of borrowing in a (bond) market at a given repayment rate. The entrepreneur has a choice between two different techniques,

a safe and a risky one. The safe investment gives a rather small payoff with high probability (and otherwise 0), whereas the risky investment gives a large payoff with a small probability. On the average, the safe investment is better than the risky one. Asymmetric information enters into the problem since the choice of technique cannot be observed before it is too late.

It is easily seen that at high repayment rates, the investor prefers the risky investment, since the lenders must take the loss in case of a default. But this means that the money market cannot fund investments at the high repayment rates, and consequently not be made.

A bank which can observe investor behavior at a cost will save the day, since it can force investors to choose projects with better average performance, that is the safe project, so that investment can be performed after all. This comes at a (monitoring) cost, but even so it may be better for society than the previous situation with no investment at all.

Information signalling: The last of our four models deal with a situation where entrepreneurs cannot readily borrow money for their projects, mainly due to asymmetric information – the market cannot observe the quality of the projects and therefore investors are reluctant to fund these projects. The trick for the borrowers to solve this problem is to go together, borrowing and repaying as if it was a single project, so that losses of one project is covered by gains of another one.

The model is somewhat technical, and we use a result about expected utility under the normal distribution, which is rather intuitive but not quite straightforward to prove. In the case you should worry about its proof, it is also there, but you may skip it at wish.

It is instructive also to dwell at the initial details, since the story begins as a nice classical adverse selection problem. There are many project owners, and all their projects are normally distributed with different means but the same variance (this is of course unrealistic, but it makes our story much easier to deal with). The project owners are risk averse, so they would rather avoid all the risks involved in being an entrepreneur by just selling the project ("at the root" as one says nowadays). But in the market, buyers expect this and know that if a project is set for sale at a certain price, then it is certainly worth no more, and rather less, than this price, meaning that the good projects will not be in the market (this is the adverse selection part of the story).

What can an owner of a good project do in this case? In order to tell the market that the project is a good one, the owner must keep a share of the project, selling only the rest. This information will be trusted if the owner of a bad project would lose money trying to appear as owner of a good project, so one can determine the minimal share that the owner of good projects will have to keep.

Now the good projects can be sold as such, and everyone should be happy. Well, not quite, the good project owners are sitting back with a small risky project which

they would rather have been without. The utility loss from engaging in risk cannot be reduced in an individual basis, this was the price which had to paid to sell the project. But it can be reduced if project sellers go together, create a joint project by merging all their individual projects, and then put the new merged project for sale. Checking the details (here it is nice to have a formal model) one sees that the joint project is less risky (this is intuitive and follows also from the variance formula), that the share which must be kept increases (this was perhaps less intuitive, but again, the share must be such that the bad project owners would not hurt by pretending to have good project, and since the good projects are less risky, they must take on a larger share) and finally, that the cost per project owner decreases (as it should). Thus, we have created a bank in the form of a coalition of borrowers; actually, many of the institutions for providing real estate credits have arisen exactly in this way.

We skip section 5, which addresses the question of whether financial intermediation can create cycles (so that the banks might be the cause of a real economic downturn), an interesting question to which we return in another context later.

Upon request I have uploaded some slides from the two first lectures. Although they are dated last year, they actually go back to the time of covid19, and they will not be updated any more, so you should keep in mind that they do not necessarily correspond to the lectures.

We read:

Chapter 1, Sections 1.3-4.