

Social Costs from Moral Hazard in Banking

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Disclaimer: This note is by no means a complete discussion of problems and solutions related to moral hazard in banking. You might think of additional arguments that both support and oppose the claims made in this note.

1) What is moral hazard?

Moral hazard refers to the problem arising when a subject (the Principal) **delegates** a task to another subject (the Agent) and the Agent takes actions that affect the outcome but are not observed by the Principal. Examples are endless. To cite a couple:

- the probability to be sick after a dinner at the restaurant depends on how fresh is the fish that the restaurant buys and serves,
- the profit that a company generates for its owners depends on how hard the managers and the employees of the company work.

The key cause of moral hazard is **asymmetric information**. That is, the Principal cannot observe the action taken by the Agent (at least not without incurring a cost). In order to ensure that the Agent acts as the Principal would like, the Principal must provide the right incentives to the Agent. For example, the Principal might want to reward prudent behavior and/or punish risky behavior. Since the Principal does not observe the action taken by the Agent, only its outcome, this is easier said than done.

Asymmetric information matters only if there is some **uncertainty** with respect to the outcome. If the outcome is completely deterministic, then the Principal can infer exactly the action chosen by the agent just by looking at the outcome, and moral hazard ceases to be an issue. It turns out that uncertainty is not enough to have a moral hazard problem. Moral hazard is an issue only if one of these factors is present:

- **Limited liability:** a limit to how hard the principal can punish the agent
- **Agent's risk aversion:** the above-mentioned uncertainty requires the outcome of a task to be uncertain even if the Agent takes the action preferred by the Principal. To induce an Agent to choose the action preferred by the Principal, success must be rewarded while failure must be punished. As a result, the Agent must face some risk: when she accepts the task, she ignores what her compensation will be. Usually people dislike risk, and in order to accept risk they require a high average compensation. The compensation needed to induce the Agent to accept the task can exceed what the Principal is willing to pay. As a result, either the task is not assigned, or it is assigned, but punishments and rewards are weak and the Agent takes an action different from the one that the Principal prefers.

2) What forms does moral hazard take in banking? / Who are the Principals and the Agents?

In the banking sector “choosing an action different from the one that the Principal prefers” often means investing in a risky project rather than in a safe one (*gambling* as in Helmann-Murdock-Stiglitz (HMS)), or (ii) exerting low effort/shirking, which reduces probability of succeeding (as in Holmstrom-Tirole (HT)).

The Agent in this course is the party carrying through projects that are financed, at least in part, by someone else. Hence, the **Agents** can be

- (i) *firms* financed by banks, individual investors or a combination,
- (ii) *banks* choosing how to invest and how hard to monitor, financed by depositors.

The **Principals** can be:

- (i) *banks* who want the firms to invest prudently (HT is an example),
- (ii) the *government* who wants the banks to invest prudently (HMS is an example).

Hence, banks can act as both Principals and Agents, depending on the part of the bank’s business we focus on.

3) What are the social costs of moral hazard in general?

We can think of 2 types of costs.

- Moral hazard can result in **missed opportunities** (the technical term would be *market failures*). The cost arises whenever socially desirable projects are not undertaken because the Principal cannot monitor whether the Agents will choose the desired projects. In this case, either no project is undertaken, or the project is undertaken but it is not the most socially desirable one.
- Moral hazard can be reduced or eliminated with **costly monitoring**. The cost of monitoring are the resources “wasted” to reduce the asymmetric information.

If risky behavior implies that the cost of an investment exceeds its expected return, the project is not socially desirable. In our models, such investments will never be undertaken in equilibrium since a rational Principal would never allow the Agent (banks and/or firms) to gamble at the Principal's expenses (banks and/or government). Arguably ("outside our models") risky and ex ante socially costly investments do occur from time to time, and can be very socially costly. The most common use of the term “moral hazard” outside the economic literature refers to these instances. Here in Norway, examples where this *may* have been the case are the so-called "Terra municipalities" and the "Røeggen case".

There are three observations to be made:

1. The *ex-post* failure of a project does not imply that *ex-ante* the project was the wrong choice. Good projects fail, they just fail less often than bad ones.

2. The models we considered could be extended to include the possibility of funding wrong projects. It is enough to assume that risky projects are worse than safe project, but better than any outside option: then whenever firms cannot be motivated to choose the safe project, investors will prefer the risky project rather than no project at all.
3. In the real world, we all make mistakes, and we rarely behave like the rational agents in economic models. We make mistakes because our judgment is often biased in a way or another. When an economic agent (the Principal) delegates a task to an Agent, there is often more room for Principal's biased judgment than in cases in which the Principal acts on her own behalf. Models that include "irrational/biased" decisions often appear to be more "realistic", then models in which all agents are rational. Nevertheless, the rationality assumption has its own advantages. The main one is that the rationality assumption allows to have a (relatively) simple framework that does reasonably well in predicting the real world behavior and *can be used in many contexts*.

4) What are the social costs of moral hazard in the banking sector?

In seminar 2 (Sep 16th) – Problem 2 we worked on a model where firms act as Agents and banks act as Principals. Firms can invest in a safe project with a positive expected return, or a risky project (the gamble), with a negative expected return. Firms have no own capital. Firms can get financed by uninformed investors or by banks. Banks have a monitoring technology. By paying a **monitoring cost**, banks can observe the actions of the firms. The problem of asymmetric information can be eliminated, but at a cost.

In this setting, if the expected return of a safe project is sufficiently high, firms will invest in the safe asset even if banks are absent. If the expected return on the safe project is not as high, unsupervised firms might prefer to gamble. Anticipating this, uninformed investors will not lend to the firms. In this case, there is a need for bank credit. Banks can "force" prudent behavior on the firms. This is obviously a social cost: firms have the ability to invest prudently, but society has to pay a cost in order to make sure that firms behave "as they should". For firms with low expected return on safe projects, the monitoring cost makes the project unprofitable. This is also a social cost: **socially desirable investments are not carried through**.

Firms might also differ in the amount of initial capital. HT is a model where firms can work hard or shirk, and they differ in the level of initial capital. Banks can reduce the private benefit from shirking at a cost. The asymmetry of information is reduced by banks, but not eliminated. In addition, banks do not monitor unless they have a reason to do that. Hence, banks might choose to knowingly lend to shirking firms if risk can be carried over to uninformed investors.

Clearly, investor knowingly financing shirking firms is not an equilibrium: uninformed investors would not participate knowing they are the "greater fool". Looking beyond the model, such "out-of-equilibrium" behavior may perhaps not be as unreasonable(?). In HT, uninformed investors know that moral hazard may be a problem (which is why they might need monitoring assistance from banks). Moreover, they have information on the extent of the moral hazard problem, the banks' monitoring costs and the level of capital in each firm. Although "uninformed", these investors are assumed to be quite sophisticated! In the real world, investors might not have all this information, and might have

to rely on learning from their mistakes.

Let's go back to the equilibrium in HT. Firms with large capital will pay a high cost in case of failure. Liability "is not that limited" for firms with large capital, as a significant chunk of the cost of failure is borne by the firms themselves. Moral hazard is not a problem (firms have no incentive to shirk), and uninformed investors can safely finance these firms knowing their money is in good hands. Firms holding an intermediate level of capital need banks to monitor them in order to attract additional direct investment. Because of the cost of monitoring, this is a social loss. Monitoring reduces, but does not eliminate the benefit from shirking. As a result, it is not possible to make sure that low-capital firms work hard, and these firms will not get financed at all. This is obviously a social loss since low-capitalized firms are as efficient as the other firms when given the right incentives.

We could think of an extension of HT model where some firms are honest and always work hard (= add adverse selection to the model) for all levels of initial capital. If the market is not able to separate the honest firms from the shady ones (those with a moral hazard problem), moral hazard in some firms might lead to **low-capitalized honest firms not getting their projects financed** (or, alternatively, **some shady firms might get financed despite having incentives to shirk**).

Lastly, **bank failures may lead to contagion to other banks**. The failure of one reckless bank may have adverse effects on other (potentially prudent) banks. If the financial sector does not have the right incentives, failed investments can have severe effects on the entire economy. Banks' excessive investments in housing in several countries up until the financial crisis in 2008 can perhaps be seen as a failure to adjust for moral hazard (incentive constraints were violated).

5) What are the possible regulatory solutions to moral hazard? What are the costs of regulation?

As we have seen, moral hazard might be a problem both for firms and banks. Banks can have incentives to gamble (as in HMS) or to knowingly lend to shirking firms (as in HT).

As HT showed us, firms which invests a large share of their own capital in projects are more likely to work hard (or invest prudently). The same intuition should apply to banks. The argument for capital requirements is that banks with a large share of own capital have more "skin in the game". Such banks incur large losses from failed investments, and therefore they are averse to risk.

However, imposing capital requirements may not be without costs. First, capital requirements have an opportunity cost whenever the bank can obtain a larger return by investing elsewhere (if the bank had no better options to use their capital, then banks would invest their own capital in the projects they finance with deposits and there would be no need for capital requirements). Moreover, capital requirements, are likely to result in a decrease of the total amount of bank funding, leading to fewer efficient investments being realized. Had moral hazard not been a problem, the need for capital requirements would likely be smaller. Hence, **the cost of imposing capital requirements can be seen as an indirect social cost of moral hazard**.

HMS propose a way to reduce capital requirements without increasing moral hazard. They suggest imposing **deposit interest rate ceilings** combined with capital requirements. With deposit interest

rate ceilings, banks cannot compete on interest rates, and competition is therefore less likely to give incentives to gamble.

An alternative to deposit interest rate ceilings may be to directly **limit competition** in the banking sector. With limited competition the charter value of each bank will (hopefully) be sufficiently large to motivate banks to invest prudently. Unfortunately, increased market power from reduced competition would likely lead to higher lending interest rates and too little investing from a welfare view. Having too big banks may lead to moral hazard too: knowing that the authorities will never allow a major bank to fail, big banks may have incentives to gamble as well ("**too-big-to-fail**").

A final cost of regulation (are there more?) is that the government **spends resources on monitoring** the financial sector to verify that rules are followed. This is typically done by the central bank system in addition to specialized regulatory bodies (*Finanstilsynet* in Norway, *Securities and Exchange Commission* in the US).

6) Are there instances in which moral hazard is the result of regulation?

Regulation may alleviate some of the problems related to moral hazard, but regulation can, in some instances, worsen the moral hazard problem. As mentioned in the introduction, moral hazard may appear if the risk is borne by a third party. As history has shown us, that third party can be the tax payers.

There are at least two related reasons for why an intervening government may worsen the problem of moral hazard. The first is the **expectation of the government saving banks** in trouble, the second is **deposit insurance**.

There may be good reasons for the government bailing out banks in trouble. If banks are allowed to fail, a problem in one bank may get other banks in trouble due to contagion. Through the interbank market, banks may have large positions in other banks, and if one bank fails to pay its obligation, the creditor banks may have difficulties paying their obligations. Other social costs of allowing banks to fail may be the loss of know-how and important lender-borrower relationships ("relationship banking").

The expectation of a safety net in case of trouble may lead banks to act recklessly. In order to counteract this potential moral hazard problem, the government may impose rules that **punish the individuals responsible for risky behavior** without compromising the assets of the banks. One solution may be to **seize the assets of the bank** – a government takeover. If the stockholders (owners) and management are properly punished, they may be less inclined to act carelessly despite the public saving the bank. To summarize: bail out the bank, not the management and stockholders.

Deposits up to a certain amount are typically insured by the government (the Federal Deposit Insurance Corporation (FDIC) in the US, Bankenes sikringsfond in Norway). There are good arguments for having deposit insurance. First, the risk of a bank run is significantly reduced (as we saw in the Diamond-Dybvig model, a bank run may force a bank to bankruptcy despite being solvent). Secondly, depositors are typically both uninformed and unsophisticated, and it would also be inefficient to have each depositor monitoring the activities of a bank.

On the other hand, insurance itself may cause more reckless behavior, and for banks this could mean higher risk taking knowing that the government is liable for bailing out depositors in case of bank failure. This moral hazard problem can be alleviated by banks having to pay **risk-adjusted insurance premiums**. Banks with more risky investments should pay a higher premium. This presumes that the riskiness is observable for the insurance company. This may not be entirely true, due to asymmetric information.

Finally, with deposit insurance depositors may also be more careless about where they deposit their savings. Knowing that deposits are insured, depositors have no incentive to care about how banks invest their savings.

Final remarks

In some cases, banks are "inherently risky" due to limited liability, and must therefore be given the proper incentives in order to avoid excessive risk-taking. Hence, there could be potentially large social costs by ignoring the moral hazard problem. The government can impose measures that alleviate the social cost related to moral hazard. However, these measures are not without costs.

Regulation related to deposit insurance and bailouts may worsen problems related to moral hazard. Thus, when the government changes the rules of the game by regulation, they must also take into account how incentives are affected.