

Social costs from moral hazard in banking

Arne Rogde Gramstad

ECON4335 – Problem set 7

20 October, 2014

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. Unintended typos and grammatical errors are hidden in the text for you to find.

What is moral hazard (MH)

Moral hazard is a situation in which a party (the *agent*) is more likely to take risk since some or all of potential costs are borne by a third party (the *principal*). For that reason the agent may take a different action than what would be the case if the entire cost was borne by the agent. The key cause of moral hazard appearing is *asymmetric information*. That is, the principal cannot observe the action taken by the agent (at least not without cost!). In order to avoid the agent taking excessive risk, the principal must provide the right incentives for the agent by either rewarding prudent behavior or punishing gambling – or a combination of the two.

Since the principal may not necessarily know the action taken by the agent, only the outcome, this is easier said than done. There will typically be an aspect of uncertainty with respect to the outcome. Hence, the agent may fail when investing prudently (or having high effort), and the agent may succeed despite gambling (or having low effort). Also, there will typically be a limit to how hard the principal can punish the agent (limited liability) which translates into convex payoffs. Convex payoffs means that the agent will be a risk seeker, i.e., preferring a lottery with expected return X over certain return of X .

In this course "taking risk" may mean (i) investing in a socially undesirable project with a high rate of return if successful (*gambling* as in Seminar 4-Problem 2 and Helmann-Murdock-Stiglitz), or (ii) having low effort/shirking which reduces probability of succeeding (as in Holmstrom-Tirole).

With whom is moral hazard a problem in banking?

The *agents* in this course is the party carrying through the investments where at least a part of the investment is financed by someone else than the agent. Hence, the agents are either (i) *Firms* financed by credit from either banks, individual investors or a combination, (ii) *Banks* choosing how to invest (and how hard to monitor) financed by borrowing from depositors.

The *principal* is therefore either (i) *Banks* who want the firms to invest prudently or (ii) *The*

government who wants the banks to invest prudently.

Hence, banks can act as both principals and agents.

Social costs of moral hazard

If risky behavior implies that investment costs exceed expected return, the project is not socially desirable. Moreover, such investment will never occur in equilibrium since a rational principal never would allow the agent (banks and/or firms) gamble at the principal's behalf (banks and/or government). Arguably ("outside our models") risky and ex ante socially costly investments does occur from time to time. A reason may be that the financial industry may be able to find uninformed or naïve individuals who are willing to finance socially inefficient projects not knowing the full extent of the excessive risk involved in the investment. Examples where this *may* have been the case are the so-called "Terra municipalities" and the "Røeggen case" here in Norway.

Also, if the financial sector does not have the right incentives, failed investments can have severe effects on the macroeconomy. 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 (i.e., incentive constraints were violated).

The models studied in this course are mostly concerned with cases where risk-taking *does not* occur in equilibrium. As we have already seen during the seminar sessions, moral hazard is still socially costly, even if reckless behavior does not occur. The reason is that "risk taking" serves an outside option for the agents. Thus, they must be properly incentivized to invest prudently, and this "information rent" can be costly.

In seminar 4 – Problem 2 we saw a simple model where firms act as agents and banks act as principals. Firms can invest in a "good projects" with an expected positive return, or a "bad project", which is to gamble, with a negative expected return. Firms have no initial capital, and the entire project must therefore be financed externally. Firms can get either direct finance from "uninformed" investors or more costly finance from banks who have "monitoring technology". That is, by paying a monitoring cost, banks can observe the action of the firms, and the problem with asymmetric information is perished, but at a cost.

Since firms have no initial capital, they cannot be punished at all if the project fails (limited liability). Since the interest rate cost is imposed on the firms only if the project succeeds, expected costs are lower when gambling than investing prudently. For that reason it may be the case that firms will prefer to gamble under limited liability.

However, if the expected return of the good project is sufficiently high (efficient firms), gambling will not be optimal, and firms will invest prudently without banks. If the expected return on the good project is slightly lower (semi-efficient firms), firms will want to gamble, and uninformed investors will not be willing to lend to firms. Now we need banks who can "force" prudent behavior on the firms by monitoring. This is obviously a social cost: Firms have the ability to invest prudently, but society has to pay a cost in order to incentivize firms to "as they should". For firms with even lower expected return on good projects, but still with the good project being efficient, the

monitoring cost makes the project unprofitable. This is also a social cost: socially desirable investments are not carried through.

Holmstrøm and Tirole offer a more sophisticated model where firms can by work hard or shirking, and they differ in the level of initial capital, A , which can be interpreted as each firm's share of investment in the project, and $I - A$, must therefore be financed externally. Banks can reduce the shirking benefit at a cost, hence the problem of asymmetric information is reduced but not gone. In addition, banks must have incentives to monitor. Hence, banks may have incentives to knowingly lend to shirking firms if risk can be carried over to uninformed investors.

Clearly, banks knowingly investing in 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 Holmstrøm and Tirole's model, 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 being "uninformed", they are sophisticated.

Let's head back to equilibrium: Firms having more initial capital will pay a higher cost in case of failure. Liability "is not that limited" since a significant chunk of the cost of failure is mostly 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 having an intermediate level of capital need banks to monitor them in order to attract additional direct investment. Because of the additional cost of monitoring, this is a social loss. Since banks cannot completely get rid of the shirking benefits, it is not possible to incentivize low-capitalized firms to work hard, and these firms will not get financed at all: 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 to Holmstrøm and Tirole's model where some firms are "honest", i.e., would always work hard (add adverse selection to the model) for all levels of initial capital. If the market is not able to separate "honest" firms from the potentially "shady" ones (those with a MH problem), moral hazard in some firms might lead to low-capitalized "honest" firms not getting their projects financed (and likewise, some "shady" firms might get financed despite having incentives to shirk).

The model by Hellmann, Murdock and Stiglitz (HMS) consider a competitive banking sector where banks can invest prudently (efficient investments) or gamble (inefficient). Banks are closed by a regulator causing the bank to lose its charter value if the gamble fails. How much the banks can invest depends on the amount of deposits, hence the banks compete on deposit interest rates to attract funding. The HMS model has a quite surprising feature which goes against our "conventional wisdom" from mainstream microeconomics: competition can be bad! Competition leads to high deposit interest rates, reducing both current profits and the charter value (the discounted future profits) of the banks. Hence, the threat of being taken down by authorities (or closing due to bankruptcy) by a failed gamble (losing its charter value) does not have the same "bite" compared to more profitable banks. To sum up: competition may lead to moral hazard.

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.

Regulation – and 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 Holmstrøm and Tirole).

As the Holmstrøm and Tirole model showed us, firms who 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 having capital requirements is that banks will have more "skin in the game", i.e., having larger losses from failed investments, and therefore take less risk.

However, imposing capital requirements may not be without costs. First, capital is costly in the sense that bank capital may have a larger return if invested elsewhere. Second, with capital requirements, the total amount of bank funding is likely to be lower, 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 solution of reducing capital requirements without increasing the problem of 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 that the authorities limit competition in the banking sector. With limited competition the charter value of each bank will (hopefully) be sufficiently large for having incentives to invest prudently. Unfortunately, returning to our "conventional wisdom" from microeconomics: Increased market power from reduced competition, would likely lead to higher lending interest rates and too little investing from a welfare view.

However, 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 (SEC) in the US).

Moral hazard appearing as a 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 risk can be carried over to 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 lead 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 belief of being saved if in trouble may lead banks to act more 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 (e.g. 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 if each depositor should attempt to monitor the activities of the banks.

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. I.e., banks with more risky investments should pay a higher premium. This presumes that the riskiness is observable for the insurance company (e.g. FDIC), which may not be entirely true due to asymmetric information.

Finally, with deposit insurance depositors may also be more careless about where to deposit their savings. Knowing that deposits are insured, depositors have no incentive to care about how banks invest their savings.¹

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

¹ My savings account is in a bank specializing in consumer loans and credit card debt. I would *never* trust my money with this bank had the deposits not been insured. Interestingly, this bank does not allow for deposits exceeding 2 million NOK, which happens to be insurance limit in Norway.

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.