


# “A moral hazard perspective on financial crisis”

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# A MORAL HAZARD PERSPECTIVE ON FINANCIAL CRISIS

## Abstract

Moral hazard is a typical problem of modern economic system, if we consider its a central role in the events leading up to the (financial) crisis of 2008. Therefore, there is a need to better appreciate its nature and its role, if future reforms are to be well designed in order to prevent further crises, default, bankrupt, down the line. Along this perspective, the paper discusses a moral hazard perspective on recent financial crisis, from Enron bankruptcy, to Lehman case, through AIG, Bearn Stern, Citigroup bail out, commenting, eventually, selected rules contained in the Sarbanes Oxley Act issued by the U.S. Government in 2002. The paper, next, comments on recent crisis of four Italian banks and on the bail in recently introduced for European banks. Eventually, the paper focuses on the so-called "free-rider" problem, discussing pro and cons of selected financial instruments (e.g. credit derivatives), while offering from a technical standpoint with the help of an analytical approach.

## Keywords

financial crisis, bailout, bankruptcy, credit derivatives

## JEL Classification

G01, H81, G33, G23

## INTRODUCTION

Contemporary literature typically considers corporate governance as "how to ensure the managers follow the interests of shareholders" (Vives, 2000), or more generally, of as "ensuring that investors get a return on their money". It is assumed that the best interest of shareholders is to get a return on the money they have invested on the company.

Most often, people choose to buy stock being based on the perspective that the stock price could increase in the long term. Therefore, a manager who acts in the best interest of the shareholders, should have as first goal to maximize the company's stock price (value). It is well known that the stock market reflects future expectations of profitability, which means that a decision made "today" will have an impact on the stock price given by the expectations of the whole market on the future effects of that decision. Hence, if the management takes decisions that ensure the health of the company in the long term, the stock price in the present will rise. This relationship underlines that the main goal of management, as said above, should be to maximize long-term shareholders' value (Sternberg, 2004), and in other terms, the company's value. Then managers will act in the best interest of shareholders if all their efforts are focused on maximizing the company's long term value while improving the stock price.

A moral hazard problem, however, often happens in ensuring that this relationship can work. Shareholders are usually worried that managers may put first their own interests rather than company's value. For

instance, they may keep extra perks for themselves, carry out investments profitable just for themselves but not for the company, make themselves extra payments all at the expense of the good health of the corporation and then of their investment. The moral hazard problem entails the possibility that managers may deceive investors to pursue their own goals and it is one of the most actual topics of discussing among public opinion and academic debate.

## 1. MORAL HAZARD

A famous quote from Berle and Means (1932) says that “there is a separation between ownership and control”. It means that corporation’s owners, namely the shareholders, do not have control over the day-by-day operations of their company. This separation is the consequence of asymmetric information within corporations. Vives (2000) states that the contract between the shareholders and the managers leaves the latter too much discretion on how to run the business, because the managers, unlike shareholders, have the skills and the knowledge to do so (hopefully). This leads, in more than one case, to a moral hazard problem, when managers may act in their own interests instead of shareholders’ best interests. This is a widespread phenomenon, occurring not only within corporations, but in different realities of modern economic structure.

Nowadays, moral hazard is one of the most underrated problem of our economic system, if we consider its a central role in the events leading up to the (financial) crisis of 2008. Therefore, we need to better appreciate its nature and its role if future reforms are to be well designed in order to prevent further crises, default, bankrupt, down the line.

### 1.1. The nature of moral hazard: examples from real facts

In 1983, Fama and Jensen proposed to separate the management, meant as the managers’ procedures of execution, and the control of a firm, that is the monitoring and ratification activity carried out by shareholders, in order to put a brake on the agency problem in large corporations. However, because of this disjunction moral hazard spreads within big firms. In fact, owners are inevitably forced to delegate several duties to managers, which could have (and happens a lot) different objective function, and for this reason could try to reach different goals. This structure of corporate governance is indeed the main cause of moral hazard.

A moral hazard problem can be thought as an agreement between a principal and an agent who should “work” the first. Ever since the moral hazard problem arose in the early 70s, theorists and researchers gave it different mathematical formulations, which during the years have been applied to all economic fields where contractual relationship play an important role. For instance, considering the banking system, the principal could be thought as the bank regulator, while the agent is the bank (Mitchell, 2009); with regards to executive compensation issues, the principal is the common interests of the shareholders and the agent is the CEO (Fama & Jensen, 1983). Another cause of moral hazard is the so-called “hidden information”. We said that a moral hazard problem arises when we have an agent working on a project for the principal. Now, the amount of work the agent puts in have an impact on the potential success of the project. However, the problem is that the principal cannot monitor the agent’s work deeply, so only the agent himself would know is real level of commitment. This kind of private information is called “hidden information”.

The agency problem should not be neglected, since is strictly linked with the increasing level of risk-taking we have experienced in the last decade. The baseline concept is really easy to understand: if I can take risk that afterwards you have to bear, then I might be encouraged to take it; on the contrary, if I am thinking to take a risk that could have consequences just on myself, of course I will act in a more responsibly way or have at last a second thought about it. Hence, an inappropriate control of moral hazards could trigger a spiral leading to excessive risk-taking, and excessive risk-taking is one of the cause of (last) financial crisis.

An example of this mechanism can be offered by the subprime crisis. Not long time ago, a bank would have granted a mortgage only with the intention of holding it to maturity. Normally, if the mortgage holder would not be able to repay

it, then the bank generally made a loss. Therefore, the bank had a high interest in screening potential borrowers, as well as possible, in order to minimize the chance of getting a mortgage for a bad borrower. However, if a bank plans to generate a mortgage with the purpose of selling it afterwards, this incentive comes down.

Talking about corporations instead, an important example of moral hazard consequences is the bankrupt of Enron filed in December of 2001. Enron was one of the largest corporation in U.S., as much to be named amongst the top-ten U.S public company in 2000 with a \$100 billion income. However, by the time it declared bankruptcy, reported a \$31.24 billion debt, most of which had been hidden from investors all along. When this information started to come to light, made clear how the company had been over leveraged during the years (had taken too much debt). Now the question is: how managers could do such a thing without being noticed by shareholders? The answer is “external auditing firms”. In fact, using their aid the management was able to hide the high company’s debt from its shareholders, continuing to increase the leverage ratio of the company not reporting it on the balance sheets. Eventually the company had to deal with this huge amount of debt, making the company no longer able to pay its bills, and forcing it to declare bankruptcy. The bankruptcy process was really hard, above all for shareholders. The losses they made were in the order of billions of dollars, which means that most of all lost almost everything they had invested in the company.

## 2. COST AND BENEFITS OF MORAL HAZARD: THE LEHMAN BROTHERS CASE

Right after the world financial crisis of 2007, a great concern arose about the potential side effects of Fed’s interventions aimed to help some of the most important firms which were on the threshold of bankruptcy. This concern helps explain why the Fed has only rarely and reluctantly intervened in a direct way, respecting its guiding principle to do “as little as necessary” to keep the financial stability. Public policies that use taxpayer money

to bail out private companies not only are questionable, but also, more importantly, creates moral hazard, which in this case represents the incentive for those companies to take excessive risks with the knowledge that they will be saved by the government should things go wrong. Probably in this spirit the recent bail in process introduced in the European Union could be framed.

Moreover, markets have often the power to restore their equilibrium by themselves, without requiring any outside help. However, already before the outbreak of the crisis, the more globalized nature of the markets and the greater complexity of the new financial instruments traded all over the world that could have come under stress, made the guiding principle of “to do what is necessary” start to falter, being replaced by the absolute importance of doing whatever it takes to break the downward spiral in the financial system that could contaminate the overall economy (see for example Fed’s actions to avoid threats to the financial system from Long-Term Capital Management’s failure in 1998 and the 9/11 terrorist attacks in 2001). In such cases, the inevitable moral hazard caused by these direct interventions had been thought as a small price to pay in order to protect the greater good.

The chaos generated by the crisis in 2007, the worst financial crisis since the Great Depression, forced the government to step in more than once to protect almost all financial instruments involved in the financial market. Riding to rescue some of the most important American’s banks, the Fed created moral hazard on a huge scale, making what was only a vague impression a proper government guarantee, namely that certain financial institutions were “too big to fail”.

We all have been witnesses of such a behavior for both the cases of Bear Sterns and AIG. Though, betraying every existing expectation on the market, on September 15<sup>th</sup>, 2008, Lehman Brothers Holdings, another big Wall Street investment bank and primary dealer, filed for bankruptcy, triggering one of the most acute phase of the crisis. The decision to let Lehman Brothers fail (the greatest failure in the U.S. history with \$613 billion worth of liabilities listed in its filing) had an immediately a huge impact on the global financial markets,

spreading also to individuals and business that apparently seemed to have no connection with it. This failure was such a damaging blow because totally shattered the market expectations that the Fed would have not let a major bank fail. On April 8<sup>th</sup>, 2008, New York Fed president Timothy Geithner called to answer for the previous Fed's intervention in Bear Stearns, described all the possible spillover effects, such as protracted damage to the financial system, widespread insolvencies leading eventually to higher unemployment and borrowing costs, a lower standard of living due to the losses to retirement savings, would Bear Stearns have collapsed, trying to justify the bailout sustained in that case. That being said, one question arises: why didn't arguments like those convince the Fed to prevent also the collapse of Lehman, a bank very similar in both size and importance to Bear Stearns? Ben Bernanke, Fed's Chairman, said that a possible rescue of Lehman "would have required a very sizeable injection of public funds... involving the assumption by taxpayers of billions of dollars of expected losses". Beyond those that may have been the strategic decisions made on the weekend of September 13<sup>th</sup>-14<sup>th</sup>, 2008, which led to the Lehman's failure, this "no reaction" by the government has been always thought as a useless attempt to solve the moral hazard problem (which, in reality, was already too deeply rooted in the system). In this regard, we can reasonably claim that the shock can be defined as "unexpected". The shock ensued and spread all over the world in no time, caused a massive flight of money out of the banking system forcing the government, not so much time after, to the third bailout of Citigroup in the next February. Thus, what at first should have been considered as warning against potential moral hazard behavior, turned out to strengthen more than ever before the implicit Fed's guarantee of rescue.

Even though keep discussing about the what-ifs surrounding the Lehman case is of no use, one thing is likely: if letting fail Lehman may have been a mistake, rescuing it would have only reduced the level of panic and the amount of collateral damage on the global economy, but it would not have prevented the financial crises.

What are the lessons that we can learn after the Lehman's demise, and in particular, should moral hazard always be avoided?

When the Fed does intervene tries to do what's necessary to achieve the financial stability, keeping up with its guiding principle and relying on the self-correcting mechanisms of market forces. However, nowadays the extreme level of globalization among the markets all over the world and the high complexity of financial assets traded makes the definition of doing "as little as necessary" not easy to establish, not to mention that each crisis requires different judgement calls that must be executed in real time and often with only partial information.

The Fed faced the first part of the 2007 crisis by respecting its "no intervention" principle and only when the crisis became deepening turned to direct solutions. By doing so it made clear that no one entity is considered too big to fail, only the financial system is too big to fail. Bottom line, as ideal as it would be to eliminate any chance of creating moral hazard, sometimes when there is too much at stake, it has also some benefits, and in these cases, all bankers and regulators can do, like it or not, is try to minimize it.

Of course, an alternative solution could be a stricter regulation, which instead of trying to create incentives for doing the right thing, gives the government the power to demand that they do indeed the right thing, or at least that they not do the wrong thing. Unfortunately, so far this path seems to be even more difficult to undertake.

### 3. THE FREE-RIDER PROBLEM

Even assuming that management is acting only in the best interest of shareholders, a legitimate question arises: how can shareholders ensure that the managers are in fact working to maximize value's company for them?

Shareholders face problem of ensuring that managers act in their best interests. Given the problem of moral hazard, the shareholders may be encouraged to ensure themselves that management is acting in their best interest, by monitoring company's trend on their own. However, Hart (1995) argued that monitoring is a public good, saying that "if one shareholder's monitoring leads to improved company performance, all shareholders will ben-

enefit of it". This means that not all shareholders are encouraged to monitor the company if there is already one among them who is doing it. In this case, other shareholders can just look to the one is monitoring and rip the same benefits from his efforts. If that is the case, no one investor has anymore the incentive to monitor because any benefits they receive will be received by all investors, regardless of whether they invest in monitoring themselves. This kind of situation is well known as free-rider problem and resulting in the risk that none of those shareholders choosing to monitor their companies.

Moreover, as we said above, because of the hidden information problem, shareholders often have just few or no information about managers activities, which represents an obstacle for any attempt to improve accountability. In fact, the only information shareholders can count on are presented in the financial statements, and these usually are not useful enough for a good monitoring process.

Lee (2009) proposes a way to bypass both the free-rider problem and the informative gap between shareholders and management caused by the hidden information. In his work he suggests if the firm voluntarily issue earnings forecasts can reduce moral hazard problems and lower overall firms' agency costs. The baseline idea is that earning guidance can not only offer regular updates on managerial activities, but also provides information about management's expectation of future firm performances. In simple terms, earning forecasts can give a framework of the firms' future, allowing both capital markets and shareholders to evaluate the operating of management not only based on past and current firm performances, but also based on expected future firm performances. In addition, earnings guidance also forces managers to commit to their publicly announced earnings targets, compelling them to be more responsible for their own actions. Indeed, once published external scrutiny of earnings forecasts, managers have less flexibility to set too conservative earnings targets or manipulate those targets, and they implicitly pre-commit themselves to match them. For all these reasons, Lee (2009) claims that providing proper earnings forecasts could facilitate the monitoring process and discipline over managerial activities.

## 4. THE SARBANES-OXLEY ACT

To put a limit to the growing number of corporate governance scandals (including Enron), the United States Government stepped in by approving the Sarbanes-Oxley Act (hereafter SOA) in 2002. Though this act contains lots of new rules, only few of them have indeed a significant impact on the structure of the U.S. corporate system. The main goal of the SOA was to improve the performances of financial auditors and directors by making fraudulent activities easier to detect, increasing and aggravating potential consequences and reinforcing securities laws.

The first target of the SOA was the accounting industry. To improve the accountability of accounting firms, the SOA constituted the Public Company Accounting Oversight Board (PCAOB), whose duty is to monitor and reinforce accounting standards (Petrino, 2003). Moreover, to remove any conflicts of interests, the SOA forbade auditing companies to sell non-auditing lucrative services to their accounting clients.

The SOA also targeted the board of directors and the board's audit committee. By making a clearer definition of the role of directors, the act attempted to increase their accountability. Furthermore, the SOA disposed a reshape of the relationship between financial auditors and the board's audit committee imposing the first to report directly to the board when they believe managers are not acting in the proper way. The SOA aimed to improve the board's incentive and ability to critique and condemn potential bad choices made by the management, making the latter definitely much more responsible for its actions.

Moreover, to improve internal control over financial statements and to make management more accountable for providing accurate information on them, the SOA required that the company's quarterly and annual financial statements must be certified by the CEO and the CFO.

Finally, the SOA increased the budget of the Securities and Exchange Commission (SEC) in order to improve its supervision on public companies, enhancing the possibilities of getting caught if a company commits fraud.



At last, the SOA helped to cut down the number of corporate governance frauds, but, on the other hand, it failed to address other issues equally decisive, such as the complexity and the rules of the disclosure system. That being said, even though it cannot be considered a final solution, it was a good step in the right direction in the fight against the moral hazard problem at corporate level.

## 5. THE RESCUING OF THE ITALIAN BANKING SYSTEM AND THE NEW EUROPEAN DIRECTIVE

The Italian banks crisis had its source in the so-called Non-Performing Loans (NPLs), or Non-Performing Credits. What an NPL is? An NPL is a loan on which the borrower has failed to pay interest and/or principal for a certain period after the scheduled deadline. In this case, there are two potential options: the payments may come in late, or never arrive at all. The application in Italy of Basel regulations (as consequence of the harmonization process at European level) led to a new classification: now NPLs (“Crediti Deteriorati”, with many subcategories) are classified as such when the delay in payment exceeds 90 days. Indeed, for a bank it is quite normal to deal with some NPLs during the course of its business. These potential losses are in fact booked in advance and an expense is recorded in the income statement. However, issues can arise in case an important portion of a bank’s loans are no longer performing.

On November 22nd 2015, the Italian government approved the “Decreto Salva Banche”, an act with which four local banks, Banca Marche, Banca Etruria, CariChieti e Cassa Ferrara (whose NPLs portion had become unbearable) have been saved from failure. The rescue took place through the so called bail-in, introduced by the new Bank Recovery and Resolution Directive (BRRD), issued by the Council of the European Union and the European Parliament on July, 2014. This procedure made possible keep alive the healthy part of the four financial institutions, while using a “bad bank” as a SPV (Special Purpose Vehicle) to securitize a

great part of the NPLs (the unhealthy part of the bank) out of the banks’ balance sheets, thus reducing the risk of large potential write-offs. On one hand, this made it possible not only to prevent a greater and, most likely, harder banking system shock, but also protect job positions and small savers (i.e., the social part of bank). On the other hand, though, the bail-in provides that a bank’s rescue has to be carried out using investors’ money (shareholders and subordinated bondholders) rather than public money. And this is what actually happened. The cost of cutting off the unhealthy part of the four banks, 3.6 billion of euros, has been supported by rest of the Italian banking system, through a special joint fund called “Fondo di Risoluzione”. However, investors (140.000 between shareholders and subordinated bondholders) had to bear the cost for other 430 million.

A legitimate question concerns why bail-in and not bailout. In the past whenever a bank found itself in distress, public money (from the other European countries) would have been used to save it. The European Central Bank estimates that between 2008 and 2014, about 800 billion of euros have been used to rescue banks all over the Union. The concept of bail-in has hence been introduced with the purpose to avoid that such a situation could occur again. The basic idea is to make shareholders and anyone else who has bet on the bank more responsible, and not just about the kind of investments they make, but primarily about the importance of the monitoring-process of bank managers’ actions. In fact, for three out of the four failed banks, the unbearable amount of NPLs is the combined consequence of real estate market crisis, of economic crisis and, it cannot be excluded, also of the relative ease with which loans were granted. Now the question is what could have been done to avoid it? First of all, it must be said that Banca d’Italia had already dismissed the administrators several years before, replacing them with special commissioners. Based on the strong belief that the Italian banking system was the most solid in all the Union, and would have never needed a “rescue operation”, it seems that authorities and managers just hoped that the problem would be quietly resolved by the market. It seems however a story of moral hazard that repeats itself, on a smaller smaller scale.

## 6. AN ANALYTICAL APPROACH TO MORAL HAZARD

The lack of useful information and the free-rider problem, makes hard for shareholders ensure themselves that managers are taking actions in their best interest. Said that, the way to solve the problem, as formulated in many models (Mirrless, 1996; Dixit & Besley, 1997), could be to write a so-called compensation contract, namely a contract that compensates the manager on the basis of his effort. Hence, this type of contract compensate the manager based on performance, which is a noisy signal of manager's effort.

Holmstrom (1979) is the classical contribution from which are been drawn all the other works inherent this topic. Although is beyond the scope of this paper going too far in analytical question, it is useful to review its basic setup.

Holmstrom's formulation of the problem is very general, allowing for risk aversion on the principal side (shareholders) and for continuous choice of effort. In this paper author argued that manager can take privately an action  $a \in A$ , where  $A$  is the set of all possible actions, and this action along with a random state of nature  $\theta$  determines a monetary profit  $x = x(a, \theta)$ . The problem is to determine how this payoff should be shared optimally between the principal and the agent. The owners' utility function  $G(w)$  is defined over wealth, and manager's utility function is defined over wealth and action:  $H(w, a) = U(w) - V(a)$ . The assumptions about the functions are:  $U' > 0, G' > 0$ , stating that utility functions of both manager and principal are increasing function;  $V' > 0, x_a \geq 0$  which tell us that can be interpreted as effort for manager and so as a productive input with direct disutility for the latter (making an inherent difference in objectives between manager and onwners); and finally, since the moral hazard problem can be avoiding if manager is risk-neutral (Harris & Raviv, 1976) we assume that  $U'' < 0$ , and so that the manager is risk-averse, while the owner may or may not be risk-averse,  $G'' \leq 0$ .

Let  $s(x)$  denote the share of that goes to the manager, and  $r(x) = x - s(x)$  the share that goes to

the owners. Then  $s(x)$  and  $a$  are the result of the following constrained optimization problem:

$$\max_{s(x), a} E[G(x - s(x))], \quad (1)$$

$$s.t. E[H(s(x), a)] \geq \bar{H}, \quad (2)$$

$$a \in \operatorname{argmax}_{(a' \in A)} E[H(s(x), a')] \quad (3)$$

where the constraint (2) guarantees the agent a minimum expected utility and the constraint (3) reflects the restriction that the owner can observe only but not , since, as we said earlier, the information about the actions taken by the manager are hidden to shareholders and ensure that the manager chooses the right level of effort.

The condition for the optimal contract that solves the system is:

$$\frac{G'(x - s(x))}{U'(s(x))} = \gamma + \mu \frac{f_a(x, a)}{f(x, a)}. \quad (4)$$

where  $\gamma$  and  $\mu$  denoting respectively the multipliers on the constraints (2) e (3),

$\frac{G'(x - s(x))}{U'(s(x))}$  is the ratio of marginal utilities,

and  $\frac{f_a(x, a)}{f(x, a)}$  is the continuous incentive term.

When the incentive term is high,  $s(x)$  is high to provide more incentive; it implies that high profits are relatively more likely with high effort than low effort.

Two other important contributions are in Holmstrom and Milgrom (1991), arguing that the basic theory of moral hazard suggests that compensation should depend strongly on performance in order to create incentives, and Holmstrom (1982) the so called "Moral Hazard in Teams". The paper points out that another key problem in corporate finance and firm organization stems from the fact that output is produced by a group of agents, and



only the joint output (not the individuals' effort) is observed. Even if agents are being compensated on the basis of the observed output (which is a key quantity for incentive provision), there is the risk to free ride on others' efforts. Put simply, when exerting effort, agents bear its full cost, but only share the resulting output, and thus tend to put too little.

## 7. MORAL HAZARD AND CREDIT DERIVATIVES

What are "credit derivatives"? The basic idea that stands behind these type of financial instrument is that using it banks and other holders of corporate or individual debt can spread this risk to other willing bearers. In the simplest shape, a bank that holds a loan to a company or to an individual on its balance sheets agrees to pay a quarterly fee to a third party (which usually is an insurance company, another bank, or a hedge fund) in return of the whole payment by the third party should the borrower of the underlying loan default. This particular type of credit derivatives is called Credit Default Swap (CDS), and, roughly speaking, it's nothing more than an insurance against potential reduction in value of the loan. The entry in the game of this type of financial tools made the debt start look more and more like equity (freely trade and held in diversified portfolio), making necessary a whole rethinking about models of corporate governance and finance. Via CDS transactions in fact was possible offload the risk by sharing it with other willing entities. Needless to say, one potential issue with these transactions is the potential moral hazard they create for borrowers. Skeel and Partnoy (2007) in discussing risks and benefits of credit derivatives highlight this problem: the possibility of share the risk with CDS transactions could reduce the incentives of the bank of fulfill its monitoring role on potential borrowers, allowing them to get loans at very convenient costs even if they have consistent default risk.

That is just what lays behind the last financial crisis, triggered by the collapse of a five year-boom in housing prices which has been fueled with risky and exotic mortgage financing backed by unprecedented levels of leverage. At first, some subprime loans offered low interest rates, whereas others only required interest payments with no need of down

payment or made with no proof of income. These mortgages were then bundled into multilayered securities ranked by risk and sold to investment banks, hedge funds, insurance companies or other investors, which in most cases sought to lower risks associated with mortgages buying CDS. The growth rate of CDS market was quite high: in 2000 the CDS market was \$1 trillion; by 2008 it was \$62 trillion, approximately 4.5 times the U.S. gross domestic product. These financial tools helped to fuel the wave of mortgage-backed securities by reducing the perceived default risk. However, being a relatively new entry on financial markets, CDS and other financial innovations hadn't been tested yet under adverse circumstances. When the housing bubble burst, default risk was way too big respect what anticipated by investors, and the market for mortgage-backed securities crashed. All of a sudden financial institutions found themselves holding large portfolios of assets hard to be assessed which could be sold only at fire-sale prices. Moreover, in a time where economy and markets had become more globalized and technology-driven, there was even higher uncertainty about how to respond to potentially widespread consequences due to the failure of these new tools. As result, panic spread, markets began doubting counterparties and investors fled companies in trouble leaving them alone in facing the grim task of attracting new capital. The chain reaction was then triggered, and in short time the financial markets fell in a deep spiral of depression, and we know all too well how the story went.

The recent increase in minimum bank capital requirements imposed by Basel III, fulfill their role by containing excessive lending and investment in risky assets, but it could incentivize bank in increasing risk shifting using CDS. These incentives are greater if banks are very large and the country can afford large bail-out during a financial crisis. Summarizing, countries with large banks, where the cost of potential bail-out is lower and banks expect to receive large bailout in case of crisis (making them perceive derivative contracts less risky), are the ones with the strongest moral hazard risk. Of course, one must not forget that derivatives have also advantages, used adequately, have the advantage of improve the welfare by improving risk sharing and by allowing firms and financial institutions to hedge risk, making the line between regulation and over-regulation very thin.

## CONCLUSION

Moral hazard is a discussed question in economics and finance. It arises in corporate structure and in banking system, with the risk of triggering real financial crisis when it assumes large dimensions.

The Enron case pushed the United States to intervene in 2002, starting with the Sarbanes-Oxley Act. It changed the governance structure so that many managers will no longer have such close relationships with their boards and auditors, and it drastically increased the monitoring and consequences for corporate fraud. We think that the Sarbanes-Oxley Act represents a first step to control moral hazard at corporate level.

With regard to the banking system, the cases of Bear Stearns and AIG bailouts, and on the other hand the bankruptcy of Lehman and the four Italian Banks, showed how markets not always are capable to restore their equilibrium by themselves through intern monetary mechanism, forcing the authority to intervene. Regulatory policies have potential costs, benefits and possibly unintended consequences, typically difficult to anticipate, especially in the financial realm, where crises occur infrequently and each differs from its predecessors in important ways. Regulators typically face a critical dilemma, having to choose between letting an institution die or rescuing it through bail out procedures. The latter mechanism incentives the rise of moral hazard mechanisms, and for this reason it must be taken in the shortest time possible.

To conclude, we think this contribution showed that if moral hazard cannot be effectively minimized, then a possible solution could be based on stricter regulation. measures (or mechanisms) that rein in moral hazard and the connected excessive risk-taking; measures that create or exacerbate moral hazard (such as massive bailouts) will lead to even more excessive risk-taking and should be avoided. In this sense, we could read the application of “bail-in” mechanism that are discussed in the European Union.

In general, we think that a key question a regulator should ask himself before implementing a policy mechanism is whether it reduce moral hazard or does it increase it. This is crucial because in financial markets if someone takes a risk, someone has to bear it.

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