

# Asymmetric Information and Adverse Selection in Insurance Markets: The Problem of Moral Hazard

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## ABSTRACT

*The problem of asymmetric information occurs when one party of an economic transaction has insufficient knowledge about the other party to make accurate decisions. The moral hazard, on the other hand, is the risk that one party to a contract can change their behaviour to the detriment of the other party once the contract has been concluded. In insurance market the moral hazard is tendency by which people expend less effort protecting those goods which are insured against theft or damage.*

**Key Words:** Asymmetric Information, Moral Hazard, Insufficient knowledge, Insurance markets

## Sigorta Piyasalarında Asimetrik Bilgi ve İstenmeyen Tercih: Etik Tehlike Problemi

### ÖZET

*Asimetrik Bilgi problemi bir ekonomik işlemin taraflarından birinin doğru bir karar verebilmek için diğer taraf hakkında eksik bilgiye sahip olduğu durumlarda ortaya çıkan bir problemdir. Öte taraftan Etik Tehlike kavramı ise, bir sözleşmenin tamamlanmasından sonra taraflardan birinin diğerinin zararına olacak şekilde davranışını değiştirmesi riskini ifade eder. Sigorta Piyasalarında Etik Tehlike kişilerin sigorta ettirilen şeyin zarara uğraması veya çalınması risklerine karşı daha az çaba harcaması şeklinde ortaya çıkar.*

**Anahtar Sozcukler:** Asimetrik Bilgi, Etik Tehlike, Yetersiz Bilgi, Sigorta Piyasaları

### INTRODUCTION

One of the implicit assumptions of the fundamental welfare theorems is that the characteristics of all commodities are observable to all market participants. However this is not reality. The market participants often hold this information asymmetrically (Mas-Colell et al, 1995: 436). In many instances of asymmetric information, the less-informed side knows that the other side has more information (Katz, M.L vd, 1998: 553). The asymmetric information results in adverse selection problem which is the phenomenon where there is a hidden characteristic problem and people on the informed side of the market self-select in a way that is harmful to the uninformed side of the market (Katz, M.L et al, 1998: 565). The moral hazard problem on the other hand occurs after the transaction. In Moral hazard problem one side of the economic activity engages in activities that are undesirable for the other side in terms of their agreement. In this Article I will look to those problems of economic theory. Specific attention will be given to insurance markets. The study will begin with definitions of asymmetric information and adverse selection. Then the moral hazard problem in insurance markets will be examined.

## 1. ASYMMETRIC INFORMATION, ADVERSE SELECTION

Each party of an economic transaction should have the sufficient knowledge about the other party to be able to make accurate decisions. As briefly defined in introduction the problem of **asymmetric information** occurs when one party has not got this information.<sup>1</sup> To give an example, when a firm hires a new employee, that worker has a much better idea about his/her ability than the firm. Or, a manager of a corporation has better information about how well their business is doing than the stockholders do (Mishkin, F.S and Eakins, S.G. 2000: 395). The pioneering study that introduces and explains the asymmetric information is the famous article by George A.Akerlof (Akerlof, G.A, 1970: 488-500). The finding of Akerlof is referred to as the ‘lemons problem’ as it resembles the problem that created by lemons in the used-car market. Obviously the potential buyers of used cars cannot assess properly the quality of the used-car, whether a particular car is a good car or the lemon one that will give them grief continually. By contrast, the owner of used car is more likely to know whether the car is lemon or a good one (Akerlof, G.A, 1970: 489-490)<sup>2</sup>.

Basically there are two types of asymmetric information. The **hidden characteristic** type occurs whenever one side of a transaction knows something about itself that the other side does not. The second type, **hidden action**, occurs when one side can take an action that affects the other side but which the other side cannot directly observe ( Katz, M.L. and Rosen, H.S, 1998: 554). There are two ways which help the uninformed party to infer some information from the informed party. The **signalling** could be defined as an observable indicator of a hidden characteristic and **screening** the uninformed party’s attempt to sort the informed parties.<sup>3</sup>

The **adverse selection** is a problem of asymmetric information and occurs before the transaction. This problem arises where there is a hidden characteristics problem and people on the informed side of the market self-select in a way that is harmful to the uninformed side ( Katz, M.L. and Rosen, H.S, 1998: 565).

## 2. MORAL HAZARD IN INSURANCE MARKETS

### 2.1 What is Moral Hazard?

Moral Hazard has got a few different definitions. According to one of those definitions the **moral hazard** is the name given to the risk that one party to

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<sup>1</sup> for the asymmetric information problem in financing the corporations see Myers, S.C. and Majluf N.S.; “Corporate Financing and Investment Decisions When Firms Have Information that Investors Do Not Have” *Journal of Financial Economics*, 13 (1984), 187-221

<sup>2</sup> also see Gertler, M., “Financial Structure and Aggregate Economic Activity: An overview”, *Journal of Money, Credit and Banking*, Vol 20, N0.3, (Aug.1988)

<sup>3</sup> Because of the size of this study those concepts will not be examined in more details. For more details see on signalling; Spence, A.M. , *Market signalling*, (Cambridge, Mass.: Harvard University Press, 1974) and on screening, Wilson, C. , “ A model of insurance markets with incomplete information”, *Journal of Economic Theory* Vol.16 (1977) and Rothschild, M. and Stiglitz J.E. , “Equilibrium in competitive insurance markets: An essay in the economics of imperfect information” , *Quarterly Journal of economics*, Vol.80 (1976)

a contract can change their behaviour to the detriment of the other party once the contract has been concluded.<sup>4</sup>

In insurance the moral hazard may be defined as the tendency of insurance policy holders' less effort protecting those goods which are insured against theft or damage ( Frank, H, 1991:193).

Moral hazard also refers to situations where one side of the market can't observe the actions of the other. For this reason it is sometimes called a **hidden action** problem ( Varian, H. R, 1990: 589). Moral hazard arises when individuals, in possession of private information, take actions which adversely affect the probability of bad outcomes ( McTaggart vd 1992: 440). A moral hazard problem also occurs when actions taken by the insured affect the probability of a loss but cannot be observed by the insurer. In this case, the insurer cannot apply correct prices premium and indemnity that depend on the actions of the insured, leading to a market failure (Kangooh, L, 1992: abstract).

We can derive from those definitions that the key features of moral hazard are;

1. The presence of hidden action. One party, e.g. an insurer, is unable to observe the action of the other party, e.g. the insured.
2. The party, whose actions are hidden, either through acts or omissions, increases the probability of a 'bad' outcome.

Therefore it is likely that, fire insurance gives people an incentive to commit arson, especially if they are operating a failing business and decide that they'd rather have the cash from the insurance proceeds on the buildings than the buildings themselves. Car insurance could make it safer for people to have accidents that cause injuries or property damage. Because, motor vehicle owners may drive more recklessly as their vehicle is insured. In the Healthcare Insurance, there is probability that people take less care of their health once they have health insurance.

## 2.2 Why does moral hazard occur?

As mentioned before moral hazard is a problem of hidden action. In simple terms there is a cost involved in taking care and precautions to avoid a particular loss. When a party has full insurance, they have no reason to incur these costs since their insurance will fully cover the loss.

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<sup>4</sup> [http://en.wikipedia.org/wiki/Moral\\_hazard](http://en.wikipedia.org/wiki/Moral_hazard) accessed on 10.02.2005



For it to be worth spending  $a_1$  care rather than  $a_0$  care, it is necessary that;  
 $(\pi_0 - \pi_1)L > a_1$  or expressed another way;  $\pi_1L + a_1 < \pi_0L$

Now;

- When the individual chooses  $a_0 = 0$ , the insurance companies break even budget line is the line  $B_0y^0$ .
- The individual's budget line where they spend  $a_0 = 0$  is  $B'y^0$ . When they spend  $a_1$  it is  $B_1\alpha$ .
- Where there is perfect information (i.e. **no hidden action**) and the insurer can observe that  $a_1$  care has been taken it will offer full insurance anywhere along the new insurer break even budget line of  $B_1\alpha$ .
- For the individual in Figure 1., it is clearly better to spend  $a_1$  on care since this will place them on a higher indifference curve  $I'$  than if they choose  $a_0$  (which places them on the lower indifference curve  $I^0$ ).

But this is the situation under **perfect information**. As was mentioned before moral hazard occurs because of asymmetric information. The actions of one party (the insured) are not observable by the other party (the insurer). Now what if the insurer is unable to observe the level of care being taken? Consider the situation where they *assume* that the insured party chooses  $a_1$  level of care. In this situation;

- The insurer will offer an insurance contract based on the break-even budget line  $B_1\alpha$ . The associated premium for full cover is given by  $\pi_1L$ .
- But, the insured can choose their level of care! They will choose  $a_0$  level of care as this will place them at the point  $A'_1$ . This is on a higher indifference curve than the perfect information situation. The insured thus has an incentive to choose  $a_0$  level of care.
- This situation is clearly unfavourable to the insurer since it makes a loss, the expected payments exceed the expected premiums :  $\pi_0L > \pi_1L$ .
- A situation of **moral hazard** thus exists.

### 2.3 Prevention of Moral Hazard in Insurance Markets

There are principally two techniques which insurers can employ to discourage moral hazard. Insurers can either introduce a '*deductible*' or '*co-payments*'.

A deductible is "A provision in an insurance policy under which the person buying insurance has to pay the initial damages up to some set limit" (Katz, M.L and Rosen, H.S,1998: 581). This would be more familiar to most people as the term 'excess'.

A co-payment is "A provision in an insurance policy under which the policyholder picks up some percentage of the bill for damages when there is a claim." (Katz, M.L and Rosen, H.S,1998: 581).

Which type of countermeasure should an insurance company choose to deal with moral hazard? This depends on the situation which it faces.

If the moral hazard is of the type that it is likely to *increase the risk* of a loss then the insurer should choose *deductibles*. This is because the use of a deductible saves the insurer money not only by encouraging greater care but also by reducing the cost involved in processing and dealing with small claims. (The Economist, 1995: 66)

If the moral hazard will *increase the size of the pay-out* then the insurance company should choose *co-payments*. This is because the larger the loss the insured suffers, the larger the co-payment. Insured parties have an incentive to keep the size of the loss down.

### **2.3a Can deductibles be combined with co-payments?**

It is worth considering whether insurers should combine deductibles and co-payments where the risk they are covering involves both types of moral hazard (i.e. increased risk and risk of larger payouts). It has been argued that combining both methods in the one policy may not always be a good idea.

Where making an early claim and addressing a problem sooner may reduce the eventual size of the payout then mixing deductibles with small co-payments may be bad. The deductible component may discourage making an early claim more than the co-payment encourages it, though clearly this becomes an empirical matter. "But combining big deductibles with big co-payments might deter people from buying insurance altogether". (The Economist, 1995: 66)

How is the best means of addressing this sort of situation? The suggestion has been made that the appropriate response to this particular situation is to that insurers should scrap deductibles altogether and replace them with bigger-than-usual co-payments.

Again however the problem is that the insurer may not know which of the two risks (more claims or larger claims) is the greater problem.

## **3. GOVERNMENT INTERVENTION IN INSURANCE MARKETS?**

Given these two private responses to the problem of moral hazard in insurance markets, is there anything that governments can do? The answer lies in the introduction of taxation on activities which increase risk, and subsidy of activities that improve the care an individual takes. (Katz, M.L. and Rosen, H.S, 1998: 575)

If we return to the situation described previously. Consider the situation where:

- The government offers a subsidy 's' on expenditure on care and activities which reduce risk.
- The cost to an individual of reducing their probability of loss to  $\pi_1$  is now  $(1-s)a_1$ .
- At the same time, the government introduces a lump sum tax of  $T = sa_1$ .

- This level of tax is paid now no matter what level of care an insured person chooses.
- If the government sets  $s = 1$  ;  $T = a_I$  , then individuals will have an incentive to take care of  $a_I$  since if they do not they will be worse off.

This sort of intervention might persuade insurance companies that on the break even contract line  $B_1\alpha$  they can now offer better coverage - e.g. lower deductibles or lower co-payments.

However government intervention, like the private decision relating to deductibles and co-payments, requires that the government have information about the optimal sizes of the tax and subsidy it offers.

#### **4. MORAL HAZARD AND IMPLICATIONS FOR PUBLIC HEALTH CARE POLICY**

There are a number of implications for government policy of the existence of moral hazard.

1. If the government decides to introduce a system of universal health care, i.e. a situation where the government assumes the role of the health insurer through the introduction of compulsory payments (a medical care tax) used to fund a public health system open to all with no extra payments. Moral hazard could lead to citizens taking less care of their health than where they must privately bear the cost of their actions. This may lead to rising costs in the health budget.
2. In the presence of universal health insurance and a public health system the government may need to introduce a variety of taxes and subsidies in order to reduce the moral hazard problem and pay for the rising health costs associated with a particular risky practice. E.g. higher taxes on tobacco products to discourage that risk activity and to finance the health care associated with smoking.
3. The other option open to the government to discourage abuse of the public health sector is the introduction of deductibles and co-payments. However if consumers are able to purchase private health insurance to cover the co-payments then the moral hazard remains.
4. Eliminating moral hazard and its effects on the health component of the budget thus becomes quite difficult, especially where private insurance exists along side public health and universal cover.

#### **Conclusion**

Moral hazard is a problem of hidden action which leads to increased likelihood of undesirable outcomes.

Moral hazard in insurance markets occur because consumers are able to obtain full loss coverage at a premium based on a level of care  $a_I$  whilst in fact they may take no care in avoiding the loss.

Private responses to moral hazard include the use of deductibles and co-payments, the choice depending on whether the moral hazard increases the risk or whether it increases the size of the loss.

Government response is normally through taxes and subsidies. Moral hazard can be a particular problem if the government chooses to provide universal coverage and public health care alongside private insurance.

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