Double Oral Auctions and Tendencies toward Moral Hazard[1]

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Abstract

Paper uses an economic experiment with 96 subjects to examine the tendencies of economic agents towards moral hazard. Design of the experiment allowed simulating third party's intervention on a market (e.g. state funding accelerating purchase, health care insurance function on the market with health care). Obtained data are statistically evaluated and it is shown, that economic agents incline to moral hazard in case, when it is possible. Study shows how rational agents became less rational in terms of average market price, after intervention of a third party on the market. Third party intervention raises the average market prices presenting a manifestation of moral hazard. It is shown, that under given assumptions, even rational economic agents diverge from rational and market efficient strategies and behave irresponsibly. During experiment we observed robust deviation in equilibrium market price before and after the third party intervention.

Key words: Moral hazard, economic experiment, market failures, equilibrium market price

Introduction

The problem of asymmetric information and its impact on market efficiency was described by Akerl of (Akerl of 1970). Akerl of showed that asymmetric information is harmful and can lead to market failure. Moral hazard is one of the possible manifestations of asymmetric information. Generally we assume that moral hazard is a change of economic agent´s behaviour when circumstances change. For instance, moral hazard is the risk of behavioural changes of insured after contract of insurance is signed. Insured simply transfer one part of a risk to the insurance company and it can result in his behavioural changes or even in damages of insured object, since he does not bear the financial burden any more.

However, moral hazard is not a problem specific only to the insurance industry as it can be found almost in all fields of human activities. Theoretical background of moral hazard issue in economics dates back to1970s. Recognition of moral hazard started by published studies of Pauly (Pauly1968), Zeckhauser (Zeckhauser1970), Arrow (Arrow 1971) and Mirrlees (Mirrlees1999).Mirrlees paper was published in 1999, but completed in 1975. Capra et al. (Capra, Comeig and Fernandez 2009) have empirically shown that moral hazard increases the chance of failure of investment projects. Study also showed that investors can be separated upon their risk attitudes also in moral hazard environment where such pattern is not expected. Jackson and Schneider (Jackson, Schneider 2011) found that moral hazard can be mitigated by common elements in social background of economic agents. Spenkuch (Spenkuch2011) documented, that people with health insurance do not undertake preventive care actions and are willing to be insured, once they realize, that their health is weak. Andreoni (Andreoni1988) and Costa (Costa 2005) showed that bigger groups have larger tendencies toward moral hazard than small ones. Bradbury and Drinen (Bradbury, Drinen2004) pointed out how different rules between baseball leagues create area for moral hazard among pitchers and how the possibilities of moral hazard induce unsportsmanlike conduct. One of the most known particular examples of moral hazard related to the insurance market is the case of a small city in Florida in the 1970s. This event was published in Wall Street Journal 12/23/74. In this particular case, more than 50 people suffered accidents of various organs and extremities. The witnesses of these injuries were mainly relatives of the victims and as one investigator noted, most often the parts they seemed to need the least were shoot off. Over 300 000 $ were paid to the victims.

However the issue of moral hazard is not related only with the insurance market. Current situation of the global economy (fall 2011) was caused largely by moral hazard executed by authorities such as governments, institutions, ranking agencies, banks, chief executive officers, politicians etc. The status of the European common currency and efforts aimed at its stabilization by the European Stability Mechanism are often seen as manifestations of moral hazard, because imprudent countries are protected and saved at the expense of prudent countries with better balanced budgets. Another example of moral hazard are the governments bail-outs to banks, thus, banks are no more conservative and are willing to support and finance risky projects. Moreover governments have been buying toxic assets (assets fallen in value which are no more marketable) from the bank sector and has been providing rescue packages to the bank sector and big companies, which are "too big to fail". Rescue packages have also been given to some countries. At this time, lively debate among the population is led to determine laws in order to punish clerks, politicians, and office holders when they act and decide in favour of fallacy and non-efficiency, in order to avoid moral hazard. Examples of mentioned kind of behaviour are the golden parachutes given to employees which are leaving companies (very often these companies are state enterprises). Government benefits for unemployed, for peoples in distress, for parents that have children out of wedlock etc., are nothing but an area for moral hazard, because these public supports encourage people to become unemployed, to stay in distress and to have a child out of wedlock.

According to Kenen and Swoboda (Kenen, Swoboda2000) moral hazard is created by government guarantees of private loans and financial regulations, because cost of risky behaviour is covered by a third party. They mentioned as well that international financial support may contribute to moral hazard because of transferring losses outside of the country.

Previous examples demonstrate that intervention of a third party may cause moral hazard. The aim of this paper is to study and reveal tendencies of economic agents toward moral hazard in the case of equilibrium market price, when third party intervenes on the market. Experimental design enables the simulation of moral hazard of economic agents in the case of receiving governmental support (e.g. rescue packages to bank sector, co-financing projects, state funding with aim to accelerate purchase etc.).

However this study treats only aggregate data, not micro data that we obtained during the experiment. We are using economic experiment proposed by Gilette (Gilette1996). To present obtained data, descriptive statistics are used and to test hypothesis, inductive statistics are used.

Material and Methods

Experiment was conducted on Technical university of Košice – Faculty of economics, during summer term of 2011. In total, six sessions with 16 students each have been conducted, thus 96 students participated in total.

Rationality of subject was induced by monetary payments at the end of experiment, which depended solely on the subjects´ behaviour during experiment. A total of 400€ was paid to the participants. Design of experiment included social, economic and moral aspects of trading.

Experimental design

At the beginning of every session participants were randomly divided to buyers and sellers. Participants knew that they were about to trade an unknown good on a market consisted of a given number of sellers and buyers. Participants communicated via an internet chat room. Every buyer was given a reservation price and every seller was given production cost. Buyer profit is calculated as the difference between his reservation price and the price at which he negotiated a transaction. Thus, to make the most profit possible, buyer needed to negotiate transactions as much below his maximum price as possible. On the other hand, sellers´ profit is calculated as the difference between the actual sale price he received from a transaction and his production costs. Thus, to make the most profit possible, seller needed to negotiate transactions as far above his production cost as possible. Of course, any seller could not sell at the price which was under his production cost and buyers could not buy at the price which was above his reservation price. Equilibrium market price and individual buyer (seller) reservation price (production costs) are shown on Figure 1. In our model, the exact value of the equilibrium market price is equal to 9,025 €. To induce trading, average reservation price is above average production cost. Market restrictions have been controlled by the supervisors who had access to chat rooms where participants performed their negotiations. After the experiment instructions have been presented, participants were asked, if they fully understood the experiment. Any further questions were fully answered. Then experiment started.

After completing five rounds of negotiation and trade, participants were told that the market structure has changed and a third party will intervene on the market. This third party now will pay 80% of the negotiated purchase price in all remaining rounds to buyers. This simulated state funding with the aim to accelerate purchase. After completing ten rounds, final payoffs have been calculated and participants have been paid. Every session lasted approximately 60 minutes.

The argument for the third party intervention is to stimulate economic activity.
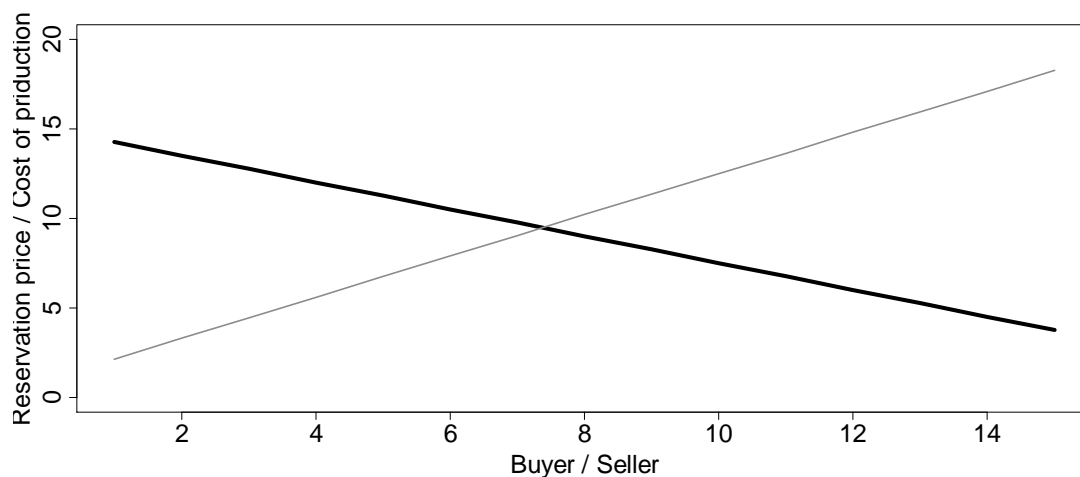

Fig. 1: Equilibrium price

Assumptions

Since we suppose that economic agents are rational and profit maximizing during the whole experiment, we do not expect robust deviation in equilibrium market price before and after the third party intervention. Our hypothesis is as follows: intervention of the third party on the market in last five rounds will not affect behaviour of economic agents and the price of the good will not increase. In Table 1, particular reservation prices of buyers and particular production costs of sellers are illustrated. Equilibrium market price is 9,025 €, average reservation price is 10,31 € and average production cost is 7,04 € (higher average reservation price than average production cost in order to stimulate trade).

buyer/seller	reservation price	production cost
1	6,00 €	11,35 €
2	7,50 €	10,20 €
3	9,00 €	9,05 €
4	9,75 €	7,90 €
5	11,25 €	6,75 €
6	12,00 €	5,60 €
7	12,75 €	3,30 €
8	14,25 €	2,15 €

Tab. 1: Prices and costs

Results and Discussion

Figure 2 presents the evolution of average market prices among six groups within ten rounds. By eyeballing Figure 2 one can state, that in the first five rounds, the average market price is noticeably lower, than in the last five rounds. Moreover, during first five rounds, economic agents were able to trade below equilibrium market price. Equilibrium market price is illustrated on the Figure 2 by a straight line with equation $y=9,025$. Thus, in aggregate, third party interventions seemed to result in a rise of the market price.
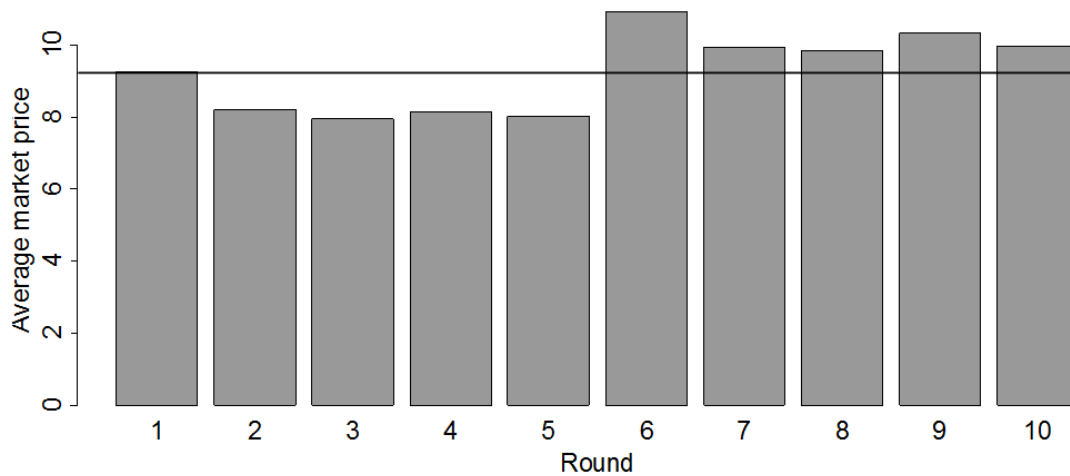

Fig. 2: Average market price over 10 rounds

If we take a closer look on the evolution of prices in individual groups we can observe the same pattern as in the aggregate view. Figure 3 illustratesthe evolution of average prices of the good during the experiment. Equilibrium market price is illustrated on Figure 3 by a straight line with equation $y=9,025$. We can see, that before the third party intervention, only in three cases (groups) the average market price was above equilibrium market price. Contrary, after the third party intervention, only in one case (group) the average market price was below the equilibrium market price.
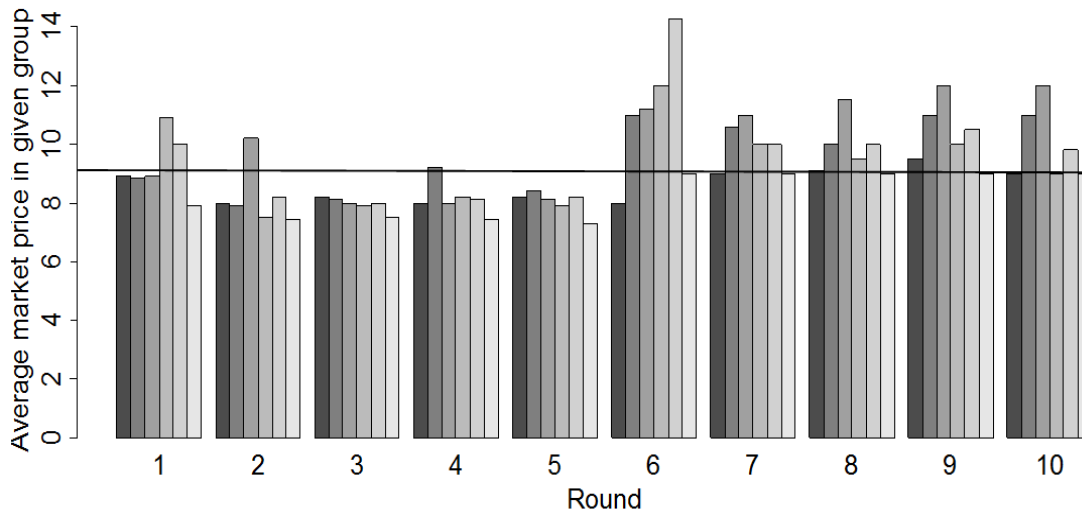
Fig. 3: Average market price of individual groups over 10 rounds

To test our hypothesis, we first test our data for normality using the Shapiro–Wilk test and then we use appropriate methods.

Shapiro–Wilk normality test:

H_0: Sample comes from a normally distributed population.
H_1: Sample does not come from a normally distributed population.

P-value for data obtained in the first five rounds is p=0,000139 and p value for data obtained in the last five rounds is p=0,01571. We conclude, that datasets do not come from normally distributed population, thus we will use nonparametric statistics. Since data are not normally distributed and we have two observations which are related, we are using Wilcoxon Signed Rank Test.

H_0: Datasets are from identical populations.
H_1: Datasets are not from identical populations.

Obtained p value is p=2,58e-06, thus we state, that there is a systematic difference between the market prices in the treatment without the third party intervention and with the third party intervention. This conclusion confirmed given hypothesis, that third party intervention on the market deteriorate market efficiency and cause market price increase.

Conclusion

Although Pauly (Pauly1968) argues, that moral hazard is not a problem of morality and ethics, but is simply the manifestation of rational behaviour. Rice and Sen (Rice, Sen2008) showed that novice NBA players´ performance increases in the last season of their contract. However in the case of experienced players, their performance does not change during the whole long term contract. The long term contract can be seen as a surety that overcomes moral hazard incentives. This example shows that tendencies toward moral hazard can be eliminated for example by social aspects of economic agents.

This study shows how rational agents became less rational in terms of average market price, after intervention of a third party on the market. Third party intervention raises the average market prices presenting a manifestation of moral hazard.It is shown, that under given assumptions, even rational economic agents diverge from rational and market efficient strategies and behave irresponsibly. Despite generally negative attitude towards moral hazard, it is shown that economic agents have tendencies to behave in such a manner.

However it is it important to mention, that this study treats only aggregate data, not micro data that we obtained during experiment. Micro data will be the subject of further analysis.

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