Motivations and observed behavior: evidence from ultimatum bargaining experiment

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Abstract

The research question of this paper is whether it is correct to interpret "prosocial" decisions revealed in the economic experiments (cooperation, trust, reciprocity, fairness, equity, inequality aversion) as indubitable evidence of prosocial motivational presentations or of prosocial considerations. It is argued that such decisions could be determined by strong economic selfishness. In this case people consider a partner of economic interaction as possible situational constraint, restrictive factor or as possible instrument for satisfying their own selfish interests. When decisions are made on the basis of these considerations the decision could look as prosocial, but in these considerations could be absent any care about interests of the others or about balance of interests of me and other.

The results of presented here ultimatum bargaining experiments showed that "fair", "equitable" decisions of the bargaining players were determined rather by selfish motivation to maximize their gain in the given perceived restrictions of the situation than by care about balance of party's interests. So, observed prosocial decisions don't refute the *selfishness axiom.* It is also concluded that researchers should assume plural considerations and polymotivation of economic decisions, should use more sensitive and direct techniques for their measurement and should analyse in economic experiments a distribution of the different kinds of considerations and motivation.

Introduction

Game theory postulates that behaviour of economic agents is determined by selfishness, individualistic motivation. It is also assumed that they make their decisions from the individualistic point of view, don't consider the game situation from the point of view of the other agents and don't take into account the interests of the others. A large body of data obtained in economic experiments investigating cooperation, trust, reciprocity, fairness, equity, inequality aversion shows that behaviour of players deviate from the predictions of game theory. So, it was proved that economic agents do have considerations about interests of the bargaining partners and/or about their possible reactions. However, such deviations mostly are interpreted in terms of prosocial considerations and motivation. It is supposed that players more or less take into account interests of the bargaining partners and care about balance of interests. These deviations are also interpreted as evidences that refute the *selfishness axiom* of "economic man" model – the assumption that individuals seek to maximize their own material gains in economic interactions and expect others to do the same[1]. The question is whether such interpretations are always correct and indubitable? The

[1] cited from Joseph Henrich, Robert Boyd, Samuel Bowles, Colin Camerer, Ernst Fehr, Herbert Gintis, Richard McElreath, Michael Alvard, Abigail Barr, Jean Ensminger, Natalie Smith Henrich, Kim Hill, Francisco Gil-White, Michael Gurven, Frank W. Marlowe, John Q. Patton and David Tracer " 'Economic Man' in cross-

reason to put this question under investigation was a contradictoriness of the data obtained in several economic experiments conducted by the author of this paper in Russia. It was the contradictoriness from the point of view of their interpretation as evidences of prosocial versus individualistic decisions.

Let's briefly review these experiments and results. The main research idea in the first of these experiments on ultimatum bargaining (in Linz – 1990, in Moscow – 1991) was to prove that decisions of bargaining players are influenced by equity considerations – tendency to keep balance between the input/output ratio for me and input/output ratio for the other. The ultimatum bargaining game design was modified by introducing the third person who received certain share of bargained money. The experimental design included as a control condition typical two-person situation (Oppewal & Tougareva, 1992; Tougareva & Oppewal, 1991 a). Obtained data supported our predictions, which were based on equity theory. It was very interesting to compare the decisions of western and Russian (Soviet) subjects (Tougareva & Oppewal, 1991 b). Revealed effects were much stronger in Russian sample, than in western sample. Among other things, comparison of the answers in typical two-person situation showed that decisions of western players, especially proposers, were much closer to the "economic rational" predictions. Russian proposers tended to split the "pie" equally (50/50). Similar data in the ultimatum bargaining game were obtained in the Soviet Union practically at the same time by Sergey Malakhov (participants were top managers). The other different experiments – ultimatum bargaining, multi-step bargaining – conducted later supported the previous data, which were interpreted as an influence of equity, fairness considerations (exs., Tougareva, 1995; Tougareva & Antonides, 1999). In addition, experiments on gift exchange market conducted in Moscow (1993) revealed strong reciprocal fairness in subject's behaviour in a competitive environment, which was not undermined even by high stakes (Fehr, Fischbacher & Tougareva, 2002). Thus, it was obvious that Russians tend to behave in these experiments prosocially. However, in the other experiment (Moscow, 1994) investigating consistency of behaviour across experimental games majority of the subjects demonstrated consistent individualistic behaviour and only small part of them consistent altruistic (Antonides, Menshikova & Tougareva, 1996). In the experiment were used four types of games with two players (allocators and recipients) in them: trust game, decomposed game, variant of ultimatum bargaining game, and dictator game. The games were constructed in such a way to avoid symmetric distribution and the games included individualistic and altruistic choices where altruistic behaviour could not result in higher payoffs than individualistic behaviour.

Certainly, altruism is extreme type of prosocial behaviour and obviously not too much people behave altruistically. And if people have to choose between individualistic and altruistic actions only small part of them will choose the last ones. Cooperation implies satisfaction of both side's interests and balance of interests. And if people have to choose between individualistic and cooperative actions, much more people could choose the last ones, because their interests in this actions are also satisfied the same as the interests of their partners. Nevertheless, such data – predominance of individualistic choices in the latter experiment and predominance of prosocial choices in all other experiments – cause several questions. *One of the questions is whether when we observe prosocial behaviour we can be sure that it is indubitable evidence of prosocial motivation?* Of cause, not. A lot of researchers working in the field of experimental economics surely agree with this answer because in their experiments they observe strong influence of individualistic motivation. Even when people behave in economic games cooperatively they tend not to be absolutely cooperative, they

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seems to be conditionally cooperative (see Fischbacher, Gächter & Fehr, 2000). *The other question is whether when we observe prosocial behaviour we can be sure that it is indubitable evidence of prosocial considerations?* Not always. When we observe reciprocity or fair distribution we can explain these results by influence of prosocial considerations, because if there are really such considerations they surely will lead to such kind of behaviour. But when we measure in the experiment only final decisions of our subjects and don't measure real considerations that bring the subjects to these decisions it is difficult to say for sure that such is indeed the case. Exactly the same decision could be caused by absolutely opposite kinds of considerations and at present there is variety of theoretical explanations in experimental economics which this decision could confirm, so often it is rather difficult to say whether one explanation is more credible than another (ex. see Gneezy, Güth & Verboven, 2000). For example, in the labour market experiment of Ernst Fehr (Fehr, Fischbacher & Tougareva, 2002) – gift exchange market – we couldn't say for sure what kind of reciprocity we got, which kinds of considerations had our subjects. If we say about prosocial consideration it means adherence to the social reciprocity norm: to act positively in return to the positive actions of others and to act negatively in return to negative ones. In this case a person could not calculate at all whether his/her reciprocal actions profitable for him/herself or lossmaking, he/she just is doing something good, profitable for the other really as a gift presenting, but not as a rewarding. If the person's reciprocity is a reaction to punishment or rewarding from the bargaining partner we have selfish considerations. In that case a person does calculate his/her gain and loss and could consider reciprocal behaviour as more profitable than decision just to take more money for him/herself. If it is a case, people consider a partner of economic interaction as possible situational constraint, restrictive factor or as possible instrument for satisfying their own selfish interests. They try to influence the other's decision in such way in order to get more gain for themselves. If both players reciprocate only as a result of rewords or punishments of their mutual actions we have interaction of two selfish persons and they will stop to reciprocate when they will think that such action is less risky and more profitable for them (ex., last period effect in repeated games). Another example is an equal splitting in ultimatum bargaining game. There could be prosocial considerations – social comparison, tendency to keep balance in the partner's input/output ratio, tendency to satisfy interests of both players etc., and there could be purely selfish considerations – to get maximum gain in the game with reduction a risk of losses. In the last case, person cares only about own interests and is trying to get more money and at the same time to avoid rejection of the offer, and if the person expect that the partner will reject offer less than a half, he/she will propose the half. In the experimental economics there is a term "*willingness to pay*" for the observed decisions about amount of money the subjects are giving for the other person. However, psychological nature of exactly the same "willingness to pay" could be utterly different. It could be "*I want to pay*" or "*I should pay*" in case of prosocial considerations or it could be "*I have to pay*" in case of selfish considerations. Therefore, when we compare the results of Moscow and Linz experiments, it would be wrong to say for sure that equity considerations are stronger in Russian sample or that the Russians are less selfish, because obtained data are only indirect evidence. Such interpretations remain hypothetical.

So, *the last question is whether stronger selfishness undermine prosocial behaviour or in fact prosocial decisions could be determined by pure "economic rational" considerations?* First experiment in which we were trying to answer this question was conducted in Moscow in 1999 (Tougareva, Oppewal & Grishin, 2000). It was exact replication of the experiment in 1991; participants were at the same age, also university students. The dominating values in the society altered profoundly from cooperative to selfish during the period 1991-1999 and the idea was to check whether decisions of obviously more selfish subjects will be more close to "economic rational" predictions (2/3 for proposer & 1/3 for the responder and no reaction

to the presence of third person and to the experimental sharing rules). The results were very surprising. The equity seeking effect was even stronger than in 1991 and both proposers and responders tended to make "fair" decisions. It was very difficult to interpret these results. Whether we were wrong and our subjects are much more prosocial? Some doubts are cast upon it. Whether the subjects have stronger equity considerations? It is also doubtful. More believable explanation is that they cares only about own interest to get as much money as possible in this situation and they expect other player to do the same, to pursue his/her own interests. It looks as if it was rather competition than cooperation. Therefore, the following step was to check whether when players make their "fair" decisions they really have any care about interests of the bargaining partner (have prosocial motivation) or they study only their own interests (are selfish)? The aim of presented here experiment was to find the way to reveal real motivation of bargaining players.

Method

Ultimatum bargaining experiment was conducted in 2000 (Moscow)[2]. The subjects were young people 15-18 years old, 50% male and 50% female. Total N of subjects – 108, 18 pair of players in each experimental condition.

The experimental procedure had two steps. At the first step subjects completed a self-assessment of conflict style (Thomas Conflict Mode Inventory). At the second step traditional two-person ultimatum bargaining game was played with anonymity of bargaining partners. Subjects were randomly selected to the roles of Player X and Player Y. The bargaining situation was explained to the subjects in the instruction. "Two persons participate in the game – Player X and Player Y. Pairs are already randomly matched, but both players don't know who exactly his /her counter-partner is. The Player X is allotted money – 12 roubles. He/she should make a proposal of the money distribution between him/her and Player Y. The Player Y can accept or reject a proposal. Players X and Y make their decisions separately. Afterwards decisions of the counter-partners will be matched and if a proposal is accepted both players will get money according to the proposed distribution, if a proposal is rejected both players get nothing. There will be played only one game". Decision of Player X was what amount of money that he/she will keep for him/herself and what amount of money that he/she will give to Player Y. Player Y decided on all possible distributions (from "0 to Player X & 12 to Player Y" till "12 to Player X & 0 to Player Y") which offer he/she accepts and which offer he/she rejects. Before they made their bargaining decisions they answered the two questions. First (*Q1*), "Whose position is more powerful in this bargaining situation – position of Player X or position of Player Y? Second (*Q2*) for Player X – "How do you think, how much money Player Y will accept as minimum?" Second (*Q2*) for Player Y – "How do you think, how much money Player X will keep for him/herself?"

There were three experimental conditions:

1) *Control condition* – without any additional information for the subjects in ultimatum bargaining game.

2) *Competitive condition* – before ultimatum bargaining game each subject got the information that according to the results of previous questionnaire his/her partner prefers to use *competitive strategy* of behaviour in conflict situations, tends to pursue his/her own ends in prejudice of others.

[2] the research was conducted in collaboration with Vycheslav Grishin.

3) *Cooperative condition* – before ultimatum bargaining game each subject got the information that according to the results of previous questionnaire his/her partner prefers to use *cooperative strategy* of behaviour in conflict situations, tends to take into account interests of both sides and try to solve conflict in such way where interests of both sides are satisfied.

The data were analysed from the point of view of what players expect to get under given circumstances and what final decision on their own outcome they make.

Independent variables under analysis were:

Information about partner's strategy of behaviour in conflict situations – no information (control condition), partner is competitive, partner is cooperative.

Dependent variables under analysis were:

Perceived distribution of power in the bargaining situation – answer to the first question (*Q1*): position of the proposer is more powerful, position of the responder is more powerful.

Expected maximum allowed to keep – the amount of money, what the proposer expects as maximum allowed by the responder to keep for him/herself. Total amount of money (12 roubles) minus amount of money that the proposer put down as an answer to the second question (*Q2*).

Keep X – the amount of money that the proposer keeps to him/herself.

Deviation of the decision to keep from the expectation of maximum allowed to keep – Keep X minus *Expected maximum allowed to keep*.

Expected to get – the amount of money, what the responder expects the proposer will offer for him/herself. Total amount of money (12 roubles) minus amount of money that the responder put down as an answer to the second question (*Q2*).

Minimum accepts to get – the amount of money that the responder accepts as minimum for him/herself in the answers to accept or reject possible offers on money distribution.

Maximum accepts to get – the amount of money that the responder accepts as maximum for him/herself in the answers to accept or reject possible offers on money distribution.

Deviation of the decision to accept as minimum from the expectation to get – Minimum accepts to get minus *Expected to get*.

Basic hypothesis: If prevalence of "fair" decisions of our subjects in ultimatum bargaining game is determined by selfish motivation and by economic rational considerations, there should be difference in data between control and experimental conditions. Effects are expected especially in the cooperative condition, because such situational factor as bigger compliance of bargaining partner could lead to more self-profitable decisions of the players.

Alternative hypothesis: If prevalence of "fair" decisions of our subjects in ultimatum bargaining game is determined by prosocial motivation and by prosocial considerations, there should not be any difference in data between control and experimental conditions. Effects are not expected, because such considerations and motivation brings to rather stable prosocial decisions, which should not be influenced sufficiently by such situational factor as partner's personality trait (tendency to cooperate or tendency to compete).

Results

Majority of the players in both bargaining roles perceived their own position in the ultimatum bargaining situation as stronger and more powerful than position of their bargaining partner in all experimental conditions (Table 1). It indicates that players fill that they have control under the situation and are strong enough to influence the bargaining outcome. It is interesting that when the players knew that their partner is cooperative such confidence in the power of own position was the greatest. Only 3 of 18 proposers and 4 of 18 responders considered here the position of their partners as more powerful. However, statistical analysis didn't reveal any significant influence of differences in perception of the power distribution on the bargaining decisions of players, except cooperative experimental condition for proposers. It will be described it below.

Table 1

Frequency of the answers about *perceived distribution of power in the bargaining situation*

proposers				***responders***			
Experimental Conditions	*proposer* is more powerful	*responder* is more powerful	Row Totals	Experimental Conditions	*proposer* is more powerful	*responder* is more powerful	Row Totals
control condition	9	9	18	control condition	7	11	18
row %	50,00%	50,00%		row %	38,89%	61,11%	
partner is competitive	12	6	18	partner is competitive	7	11	18
row %	66,67%	33,33%		row %	38,89%	61,11%	
partner is cooperative	15	3	18	partner is cooperative	4	14	18
row %	83,33%	16,67%		row %	22,22%	77,78%	
All Grps	36	18	54	All Grps	18	36	54
row %	66,67%	33,33%		row %	33,33%	66,67%	

There was analysed a difference in expectations and a difference in the bargaining decisions of players between control and competitive and between control and cooperative experimental conditions. For the analysis of difference significance was used T-test for independent samples and Mann-Whitney U Test. Descriptive statistics and difference significance is presented in Table 2 for the proposers and in Table 3 for the responders.

The most interesting for the illustration of real motivation of players are the results for the proposers. In the control condition the data were the same as in the previous experiments (1990, 1999). The proposers tend to distribute money in ultimatum bargaining situation 50/50. They expected that their bargaining partner would accept as minimum the amount of money close to 50%.

In the second experimental condition when they "knew" that their partner is competitive the results were just the same as in control condition. There is no significant difference in expectations and decisions between control and competitive conditions.

However in the third experimental condition where the proposers "knew" that their bargaining partner is cooperative their decisions were egoistic and confirm the predictions of the game theory. They expected that the player 2 will accept around 1/3 of money as minimum and they proposed the distribution with close to 2/3 to themselves. The subjects didn't take care about the interests of the other player too much. Obviously they considered that cooperative responders are more compliant and started to exploit them. Only 3 persons proposed an offer equal or in favour to the interests of responders because they considered that position of the responder is more powerful. So, by means of these "fair" offers they defended their own interests; they avoided possibility of rejecting the offer. There is significant difference in expectations and decisions between control and cooperative conditions.

Table 2

Expectations about counter-partner's decisions and bargaining decisions of the proposers

	Mean	Median	Minimum	Maximum	Quartile Range	Std.Dev.
	Expected maximum allowed to keep					
control condition	6,06	6	2	8	0	1,16
partner is competitive	6,0	6	0	9	1	2,06
	t-value	*p-level*		U	*p-level*	
	0,0997	*,921*		149	*,631*	
control condition	**6,06**	**6**	2	8	0	1,16
partner is cooperative	**7,28**	**7**	4	10	1	1,36
	t-value	*p-level*		U	*p-level*	
	-2,895	***,0066***		68	***,0016***	
	Keep X					
control condition	6,11	6	6	7	0	,32
partner is competitive	6,17	6	5	9	0	,923
	t-value	*p-level*		U	*p-level*	
	-0,241	*,811*		157	*,835*	
control condition	**6,11**	**6**	6	7	0	,32
partner is cooperative	**7,22**	**7**	4	10	2	1,40
	t-value	*p-level*		U	*p-level*	
	-3,291	***,002***		64	***,0006***	

The results for the responders are also very informative for understanding real motivation of players. There was not found significant difference in the expectations of what they can get in the bargain. In all three experimental conditions they expected to get near to 50% of money. The responders were a bit careful in control and competitive experimental conditions, they accepted to get as minimum a little less money than 50 %. Absolute majority of them accepted to get as maximum all money.

Significant difference in the bargaining decisions of the responders was found only in cooperative experimental condition. They were more confident that they could get from cooperative proposer 50% of money and accepted to get as minimum 50 %. There are very interesting results for the decisions of responders about money that they accepted as

maximum. Already only 7 responders were absolutely egoistic and accepted as maximum all money. Five responders slightly reciprocated. They made "a fine gesture" of not absolute egoists and rejected some extremely profitable for them offers. However, there were a few responders (3-5 persons in each experimental condition), whose behaviour could be explained by presence of equity considerations. These responders accepted only close to 50/50 money distributions and rejected all others – both unprofitable and profitable.

Table 3

Expectations about counter-partner's decisions and bargaining decisions of the responders

	Mean	Median	Minimum	Maximum	Quartile Range	Std.Dev.
			Expected to get			
control condition	5,61	6	4	6	1	0,608
partner is competitive	5,17	5	2	7	1	1,98
	t-value	*p-level*		U	*p-level*	
	1,502	*,142*		119	*,135*	
control condition	5,61	6	4	6	1	0,608
partner is cooperative	5,67	6	0	8	0	1,534
	t-value	*p-level*		U	*p-level*	
	-0,143	*,887*		131	*,212*	
			Minimum accepts to get			
control condition	4,94	5	1	6	1	1,474
partner is competitive	4,56	5	0	6	2	1,653
	t-value	*p-level*		U	*p-level*	
	0,745	*,461*		128	*,255*	
control condition	**4,94**	**5**	1	6	1	1,474
partner is cooperative	**5,94**	**6**	4	11	1	1,392
	t-value	*p-level*		U	*p-level*	
	-2,092	***,044***		109	***,061***	
			Maximum accepts to get			
control condition	10,56	12	6	12	2	2,431
partner is competitive	10,33	12	6	12	4	2,521
	t-value	*p-level*		U	*p-level*	
	0,269	*,789*		160	*,940*	
control condition	10,56	12	6	12	2	2,431
partner is cooperative	9,39	9,5	6	12	5	2,477
	t-value	*p-level*		U	*p-level*	
	1,426	*,163*		118,5	*,134*	

Analysis of the *Deviation of the decision to keep from the expectation of maximum allowed to keep* for the proposers and the *Deviation of the decision to accept as minimum from the expectation to get* for the responders revealed very informative for the understanding of

player's behaviour fact. The bargaining decisions of absolute majority of the players in both roles (especially in cooperative experimental condition) were very close to or absolutely the same as their perceived boundaries of possible actions imposed on them by counter-partner. Frequency of the cases without deviation of bargaining decisions from the perceived boundaries of possible actions for the proposers and responders is presented in Table 4. Most of the deviations for the proposers were 1 rouble less than expected maximum allowed to keep and 1 case 2 roubles less. So, these deviations decreased a little a risk of possible rejection of the offer by the responder, but without big loss for own interests. Only in 3 cases (1 in control condition and 2 in competitive condition) proposers kept for themselves more than perceived boundary. In this cases proposers expected that responder would allow for them to keep as maximum 2 roubles or nothing. In the other words they expected very unfair behaviour of responders and decided to restore equity (50/50) for themselves. Most of the deviations for the responders were also 1 rouble less than they expected to get or 2 roubles less. So, most of the deviations of the responders also decreased the risk of the bargaining failure, but also without big loss for own interests. When responders expected very unfair behaviour of the proposer (only 3 cases – 1 case in each experimental condition) they also fought for their own interests and decided to restore equity (50/50) for themselves or to act in favour of their own selfish interests and accepted only very profitable for them offers.

Table 4

Frequency of the cases without deviation of bargaining decisions from the perceived boundaries of possible actions

	control condition	partner is competitive	partner is cooperative
proposers	14	10	17
	77,78 %	55,56 %	94,44 %
responders	10	10	13
	55,56 %	55,56 %	72,22 %

Discussion

Thus, the basic research hypothesis that prevalence of "fair" decisions of our subjects in ultimatum bargaining game is determined by selfish motivation and by economic rational considerations was confirmed.

Players in both roles tried to get maximum gain with minimum losses in the framework of perceived boundaries of possible actions imposed on them by counter-partner. They cared about own selfish interests and didn't care about interests of the counter-partner. They just expected that other player would pursue his/her own ends and would strongly resist against selfish distribution. So, this social constraint (but not the prosocial motivation) was the main determinant of their behaviour. When proposers and responders considered the counter-partner as more compliant they behaved more selfish and tended to get maximum gain in this situation.

Therefore, the motivation for 50/50 distribution was not really prosocial and «fair» decisions didn't refute the *selfishness axiom*. Prosocial considerations were activated mostly when the players perceived possible damage for their own interests and by "fair" decisions they defended only their own interests. Also prosocial considerations were activated as slight reciprocity of responders, as "a fine gesture" of not absolute egoists. Only few responders

really had prosocial considerations and cared about balance of interests. Their decisions could be described as “equity or nothing”. Thus, we can make a conclusion that exactly the same “fair” decisions can be determined by plural considerations and could be polymotivated.

Conclusions

This experiment corroborates that prosocial decisions in bargaining games are not doubtless proof of prosocial motivation, cooperation, fairness and equity considerations. Observed “fair”, “equitable” decisions of the bargaining players don’t refute the *selfishness axiom.* The player’s motivation in presented here experiment could be defined as *socially constrained selfishness*. The interpretations of observed in the economic experiment decisions could be wrong until the researchers will try to elicit real considerations and motivation of economic agents. Without it the interpretations will remain hypothetical. It is methodological error to interpret obtained in the economic experiments behavioural results in terms of considerations that subjects are assumed to have, if the considerations were not operationalized by more sensitive and direct than observed behaviour techniques and not measured. In addition, there should be assumed plural considerations and polymotivation and a distribution of the different kinds of considerations and motivation should be analysed. Thus, for better understanding of economic agent’s behaviour we should go deeper into the “black box” of human psychology and study not only observed economic decisions but mostly their real ulterior motives and prerequisites.

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