

## OPPORTUNISM AND RECIPROCITY IN ECONOMIC BEHAVIOUR: “Public Goods” game results - case study of Ukraine

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The article presents detailed analysis of the outcomes of Public Goods game, which was held in Ukraine in order to study the behavioural features, influencing cooperation intensity and efficiency. Experimental results agree with those of earlier research and may serve as an argument for the following conclusions. Combination of readiness for cooperation and inclination to punishment may lead to cooperation establishment and its stabilization, but doesn't allow to use its potential and get a substantial effect. Considering taxation and tax policy, experimental results allow us to doubt the fact, that loosening of control and punishment is always leading to widening of tax evasion. Opportunistic behaviour of taxpayers on the post soviet area to a considerable extent is explained by the violation of the parity in the exchange of paid taxes for public goods. The results of the research were reported on the The Fifth ISBEE World Congress (Warsaw, 2012).

**Key words:** “Homo economicus”, economic behaviour, opportunism, reciprocity, free-rider problem, “Public Goods” game, experimental economics.

### 1. Introduction.

Institutional, moral, cultural and ethical factors that influence the behaviour of economic agents, are the focus of economic science for at least the last quarter of the century. This is due to many reasons, among which the most general and initiative character has the fact, that the original assumptions, conceptual statements and conclusions of the “mainstream” are not an adequate scientific platform for understanding today's complex economic problems. The prevailing doctrine of economic development management, based on the mainstream position, does not always lead to the expected results, which is confirmed by the examples of economic practice of different countries. The paradigm of economic rationality with its «Homo economicus» model fails to explain many phenomena of economic life, which causal roots go back to the general problems of people's interaction and cooperation: motivation structure of behaviour, propensity for opportunism, institutional forms of cooperation and their efficiency and others<sup>1</sup>.

The efforts to find a new exploratory platform for the analysis of these issues have been actively undertaken since the end of the past century and, to a large extent, they are focused on interdisciplinary studies, using their methodological approaches and tools in the hope that such a synthesis would allow to overcome the limited scope of the “mainstream”. Experimental economics undoubtedly belongs to such areas of economic science. At present it's hard to overestimate its contribution to theoretical problems studying and solving of applied economic problems.

### 2. Problem statement and research methodology.

This paper addresses the problem of cooperation of people in the economic sphere and the factors influencing it, using as an example public goods financing

and the co-related problems of opportunistic behaviour in the sphere of taxation. The main instrument of economic research is a laboratory experiment. The results of such experiments provide material for comparative analysis, including a cross-country one.

### 3. Analysis of recent research and publications.

*Experimental economics.* While in natural sciences an experiment is recognized to be an indispensable instrument of research, economics has long been considered not to be an experimental science. At the same time, such term as “economic experiment” has long ago confidently consolidated itself in economic thesaurus – above all, in its general sense, i.e. in trial implementation of some propositions (results and conclusions) of economic theory. In this sense, the implementation of economic policy or of a tax policy, can be considered to be an economic experimentation: “... there is no clear boundary between an experiment itself and a reformation as it is. Every reformer operates only in the own country, but the reform in a particular country may be regarded as an experiment in the framework of the world economy” [15, p. 50].

However, if we talk about the history of laboratory experiments in economy (the first experiments refer to the beginning of the past century), then they have spread and became popular owing to the works of Vernon Smith, whose achievements were noted in 2002 by the Nobel Prize. His name is related to the formation of experimental economics – a sphere of economic science, in which controlled laboratory experiment becomes a basic instrument of research.

Laboratory experiments in economy are carried out with two main goals: firstly, in order to test the initial axioms and hypotheses of economic theories, and secondly, with the aim of data accumulation in order to formulate new assumptions and axioms. The basic axioms

of economic analysis are, first of all, behavioural preconditions: assumptions about the goals, motives, reactions of people in the process of economic decision-making. No wonder, that experimental economics combines the studies, devoted to human behaviour research: just this behaviour is underlying the economic phenomena and the processes at micro- and macro levels.

Currently, experimental economics is actively developing both in deep (the development of methodological basis of economic experiments) and in breadth (expansion of experimental methods on various areas of economic research). In the past two decades, methods of experimental economics are widely used in actual studies of taxation problems, and in particular, in the studies of opportunistic taxpayers' behaviour and the impact of tax policy on taxpayers' behaviour [4, 8, 10]. Although a wide range of the assumptions of tax theories is subjected to experimental verification, and the main attention is focused on behavioural hypotheses which underlie tax evasion patterns.

A known Sandmo's model [1], based on the concept of "homo economicus", who is guided in his behaviour by maximization of the expected utility, shows that the choice of a taxpayer in favour of tax evasion depends on the parameters of tax control, the key among which are the probability of checking and the degree of punishment (penalty rates). This model directs towards the use of punishment and enforcement, and gives rise to strengthening of tax control in order to improve taxpayers' compliance and to restrict their opportunistic behaviour.

This approach is based solely on the compulsory nature of taxes and assumes that tax payment does not fit into the framework of individual utility and represents a net loss for an economical agent. He proceeds from the conflict between personal gain (individual effect), and the need to finance public goods (public or collective effect) and thus proves the impossibility of using decentralized mechanisms to provide with such goods.

However, the assumptions that underlie this model are a significant simplification of actual people's behaviour. As practice shows, un-acceptance of risk is inherent to many people, and they usually pay taxes, even in those situations when the probability of both – detection of concealment of income and penalty – are sufficiently low. In a number of studies it's registered that people behave more honestly than is assumed in the models of taxation, based on enforcement, – in particular, it has been shown experimentally that individuals declare a higher income level than it was predicted by the model based on the criterion of expected utility maximization [13].

The modern approaches to taxation problems studying transfer attention from the compulsory character of taxes on contractual terms of taxation and on considering taxation in the context of cooperation theories, as a form of voluntary people's interaction on the occasion of public goods financing. The most important questions that are put forward in the current focus of research are:

the factors affecting the intensity and stability of cooperation of people, dependence of their behaviour from the behaviour of other individuals, propensity to punish for violation of norms and reaction of individuals on such punishment, propensity for a free rider behaviour and the influencing factors. Studies of these and other actual aspects of people's cooperation is of a great importance for tax policy, first of all because their results contribute to the understanding of the behaviour of the main character of tax relations, and to the formation of a more realistic model of a taxpayer. Efficiency and effectiveness of tax policy depend on the adequacy of our ideas about economic agents' behaviour. The adopted "working" model of a taxpayer specifies not only a set of means of such a policy, but also determines to a certain extent its goals and tasks.

*Public goods problem.* Public goods are a traditional object of study within the problematics, relating to the public sector and the policy of government's intervention. Public goods are used as an indisputable argument in the justification of the existence of the state and of its activity in the market economy<sup>2</sup>. In the theory of public goods, they are singled out by the criteria of non-rival and non-excludable consumption, and it's also stated that these properties make it necessary to provide these goods in a public way.

The goods, which have these properties, are called pure public goods. As opposed to them, private goods are rival and excludable, and for them there are effective decentralized ways of provision (market mechanism). For the goods, which have no such properties, i.e. for public goods, such mechanisms do not exist. This assertion of the traditional theory of public goods, which is closely connected with a "free-rider" problem, is now being considered as a hypothesis, which needs an experimental verification.

It is also worthy to note the circumstance connected with the relativity of non-rival property of public goods. A non-rival good may lose this property and become rival, if it is granted in non-optimal amounts. This situation provokes negative phenomena, connected with public goods distribution: it is complemented and sometimes even completely replaced, by corruption mechanism, when in fact such goods become paid for consumers, and a source of income for bureaucrats.

Any good, regardless of its rivalry and excludability properties, may be granted in all possible ways, i.e. in a public, collective or private way. The difference between them is in the cost, which the society on the whole will bear in case of granting of such a good in each of the mentioned ways. There are sufficiently many examples – not only in the past, but in modern life as well – of providing with public and collective goods by means of contracting, of conventional relations. People agree about protection against natural disasters, about public order maintenance and improvement of habitat, etc. Different forms of self-organization of citizens and business co-exist in the modern world, supplementing or replacing the state and providing not only collective,

but also certain public goods [10]. This occurs in cases when the government either does not take the responsibility for granting a particular good or, having taken it, does not provide the citizens with the corresponding goods in the right quantity and quality. In the latter case, the emergence and spread of non-government forms of providing economic agents with public goods is an indicator of inefficiency of the government's activity, and it's a negative assessment of the quality of the government's work, therefore, this represents a threat to the state: entering into competition with the state in granting certain goods, alternative mechanisms may displace the centralized ways, proposed by the government, thus leading to the revision of financing of its activities, connected with the provision with a given good.

Spreading of the forms, alternative to the state, may lead to different outcomes. In the case when an evolutionary mechanism of selection of institutions, based on the criterion of their efficiency is not violated, it leads either to the improvement of the efficiency of government's activity, or to its withdrawal from the field, i.e. to the victory of the more efficient form of economic agents' interaction. If there are barriers in the society to the process of "natural" evolution of institutions, then the alternative forms are either completely prohibited or are severely limited.

So, if we agree with the statement that there are no special features which will inevitably make goods public through the way of their granting<sup>3</sup>, then the current focus of this problematics is transferred to the study of the causes and factors of cooperation of people, of the forms of their interaction, since public goods are a special case of such cooperation.

Experimental economics offers its own approach and research methods which have already given extensive material for conclusions and generalizations [1, 8, 11, 13]. Laboratory experiments which were carried out in order to identify the factors, influencing individuals' cooperation apropos the public goods, have a sufficient history, and their activity is not diminishing since the end of the last century. We will compare the well-known outcomes of experimental studies with the results of the experiment, which we've conducted in Ukraine.

"Public goods game" (PG) experiment<sup>4</sup>. This experiment was carried out with the aim to identify the factors influencing the cooperation of individuals, their attitude towards different mechanisms of taxation and their propensity for free-rider behaviour (check of a "free rider" effect)<sup>5</sup>.

The experiment reproduces the conflict between personal gain and common effect. Motivational structure of individuals' behaviour is based on two main premises: a) existence of individual interest in the own results; b) the fact that individual behaviour is influenced by general rules and norms and by the behaviour of other members of the society (reciprocity hypothesis). There may be positive reciprocity (propensity for reciprocity in cooperation) and negative reciprocity (reciprocity in punishment)<sup>6</sup>.

The participants of the experiment had equal income,  $d > 0$ , from which each of them independently assigned a contribution  $x_i$ ,  $0 \leq x_i \leq d$ , to a public fund. The joint contribution of all the participants was multiplied by fixed coefficient of  $k > 1$ , thus the cooperation effect (public good) was represented. The resulting amount was equally distributed among the participants, and the final income of the  $i$ -th participant as a result of cooperation was equal to  $z_i = d - x_i + k\bar{x}$ , where  $\bar{x}$  is a mean contribution of all the participants. When  $k > n$  ( $n$  – is a number of participants), a participant receives a gain from his non-zero contribution regardless of the actions of other participants. When  $k < n$ , the dependence of a given participant's income on the behaviour of other participants is increasing sharply. This condition provides the motivation of participants to free-rider behaviour (Fig. 1).

As it's clear from fig. 1, in a group of 3 participants with the initial income of 20 and  $k = 1,5$  the greatest effect (35) is received by a "free rider" (№ 3).

There are various modifications of the basic design of this experiment, depending on the objectives of the study. The contributions of the participants may be treated as taxes (voluntary or compulsory), which they pay; the minimum level of contributions may be specified. The possibility of penalties may also be envisaged: participants acquire the right to penalize each other, and at that, such punishment may be not free for those who impose penalties. A one-period (without repeats) experiment design may be used (participants make decisions only once) or an experiment with repeats, in particular with the game ending, unknown to the participants. In order to clarify the influence of the factors, related to reputation, the games are held with stable or changeable groups. There may be other modifications of the experiment.

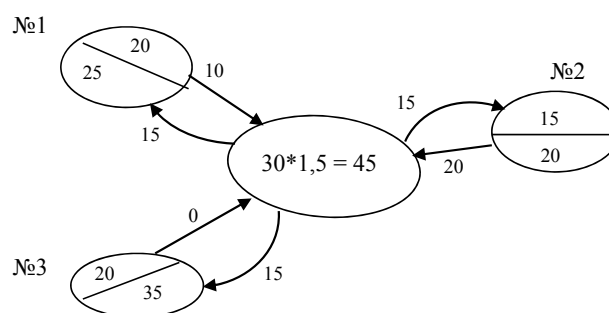


Fig. 1. Income distribution in a PG-game with a "free rider"

In connection with the use of PG-experiment in order to study individual behaviour we'll accentuate the following. The basic design of the experiment provides a strong motivation to show a free-rider behaviour based on individual interest and on absence of penalties. In the worst case (when in his own group everybody behave in the same way) a free-rider remains with his initial income, i.e. loses nothing. And if a cumulative contribution of other participants is non-zero, then he is already a gainer. Such kind of experiment design is

provoking a free-rider behaviour, and as far as it doesn't provide any restrictive mechanisms, it eliminates their influence on the agents' behaviour, thus revealing the propensity for "free-rider" behaviour, "undisturbed" by the danger of punishment. If under such circumstances, the participants demonstrate a low level of evasion of participation in the public good, it means that people have incentives to cooperation, based not on enforcement, and this may be an argument in favour of loosening of control and reduction of punishment.

*Referent results.* Among the experimental results obtained in different studies, we'll mark the following ones<sup>7</sup>:

1. People cooperate and punish in anonymous one-period games, where the future benefit of cooperation and effects of reputation are excluded. This provides confirmation of the hypothesis of the existence of strong reciprocity in people's behaviour.

2. In the games with repeats the effect of fading cooperation is observed: at first, the participants make high contributions, but with increasing repetitions the "potential" of cooperation runs dry - the rates of contributions become substantially smaller. The attenuation of cooperation is explained by the presence in a group of the people with different motivations: the behaviour of "free riders" with their highly individualistic motivation exerts a disappointing effect on the participants, inclined to cooperation.

3. Participants tend to punish those who make smaller contributions. This conclusion was substantially supplemented by the results of the studies, which were conducted in CIS states (the former USSR): the case in question is the observed effect of "antisocial punishment", when people punish not only those who make smaller contributions, but also those who contribute more, than others do.

4. A penalty increases and stabilizes cooperation at a higher level in comparison with the experiments without punishment. This is confirmed by numerous experiments, although there are exceptions: punishment is ineffective if it's perceived to be unfair. Experiments show that the exogenous (imputed) rates of punishment are less effective [9].

5. When the tax burden is universal for all the participants (equal contributions individual voluntary contributions. In this situation a convergence of individual contributions and their tending towards the optimal value is observed, together with the reduction are compulsory), the tendency to free-rider behaviour is higher than in the case of "personalized" taxation, when tax liability is determined in accordance with the of the deficiency of public goods financing [8].

6. Toughening of control of individual ways of income tax evasion may lead to compensatory expansion of the use of other possibilities of evasion, and, in the aggregate, to a decrease in tax revenues. [11]

#### 4. Tasks and conditions of the experiment.

The findings and conclusions of the previous experiments which were conducted in different countries,

were the basis for problem statement and the choice of our experiment design. The experiment was conducted in order to repeat (or to confirm) foreign results in the following main areas:

- existence of behavioural propensity for cooperation and free-rider behaviour;
- influence of punishment on behaviour and on the effect of co-operation.

We have used the design of the game with invariable anonymous groups (the participants did not know their partners in a group), an anonymous option (a contribution of a participant was not announced), with repeats (the game was held in a few rounds), and with paid penalties<sup>8</sup>.

All the participants were combined into groups of three people. In each round, each participant received an exogenous income of 20 points. Multiplier coefficient was 1.5. Participants were informed about their incomes after cooperation and about the contributions of their group playmates. After then, the participants had an opportunity to punish each other (anonymously) by penalty points.

We have to make a remark about the motivation in our experiments. In other known studies in order to interest the participants real money is often used, and participants receive it at the end of the game. However, the games are held with other motivating factors, as well as just "for fun". Motivation of our participants was ensured by the fact, that their individual results were taken into account in their modular assessment by certain academic subjects<sup>9</sup>.

#### 5. Results of the experiments.

If we talk in general about the expected results of the experiments, the expectations were the following. Participants will demonstrate cautious behaviour and a tendency to low contributions and high penalties. The average contribution most likely will decrease by the end of the game. Examples of altruistic behaviour are hardly probable. Punishment will be effective, and this will provide a low intra-group income differentiation in the game. On the whole, there was a pretty sure expectation of a low variation of the participants' behaviour. The grounds for this belief raised from certain objective circumstances: the participants represented a sufficiently homogeneous body by a number of features (such as age, education, etc.), as well there is some subjective notion of "post-soviet mentality" and the behavioural characteristics of a "post-soviet" man.

*Analysis of the average characteristics.* The absolute value of the participants' average contribution is growing steadily in all the experiments (examples of two experiments are shown in Figure 2). Note the coincidence of the mean initial contribution for all the experiments - about 10 points, or 50% of the initial income (Fig. 2a), which exactly match the result of John Ledyard [10]. An important characteristic is the variance of individual solutions. The variation coefficient of individual contributions<sup>10</sup> increased in all the experiments (Fig. 2b).

The dynamics of the average penalty, imposed by the participants, is not monotonic, but comparison of the final and the initial rounds shows a significant increase in the average penalty (Fig. 3a).

Judging by the decrease (although not monotonic) of penalty variation in all the experiments (Fig. 3b), there is a certain convergence of the positions of participants regarding penalizing each other.

*Analysis of inter-group differences.* Comparison of total group contributions and penalties shows a negative relationship between them in all the experiments – the fact, which may serve as an evidence of the rational approach of participants to punishment: penalties are imposed on those who make small contributions.

However, there may be another possible explanatory premise: those participants, who make large contributions, are not inclined to punish the others. A detailed examination of the groups with high average contributions has revealed the examples of indifferent attitude of the participants with high contributions to those, who contribute less.

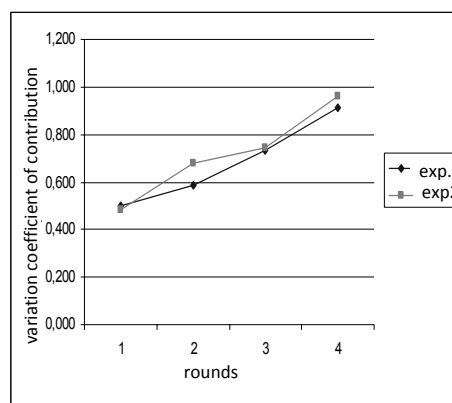
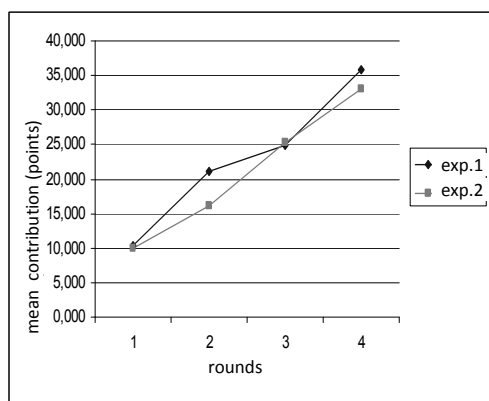
In order to evaluate group's result of cooperation a coefficient of cooperation efficiency (CE) was used: the ratio of the final group revenue to the total group revenue without cooperation<sup>11</sup>. In all the experiments, half of the groups received a positive effect from coop-

eration ( $CE > 1$ ). The values of this coefficient for each participant show that about 50% of the participants benefit from cooperation (this is observed in all the experiments).

The groups of participants can be divided into three classes by the results of cooperation.

*Class A.* Throughout the game they made large contributions and almost never penalized each other, despite of the differentiation of their contributions. This class also includes those groups, in which there was a "good example" effect: a positive balance of cooperation was ensured by a stable altruistic position of one of the participants (large contributions, regardless of the participation of others and of the absence of penalties). It is important that the behaviour of such a participant actualized a positive reciprocity property of other participants. In such groups there was an effect of growing cooperation, instead of its attenuation.

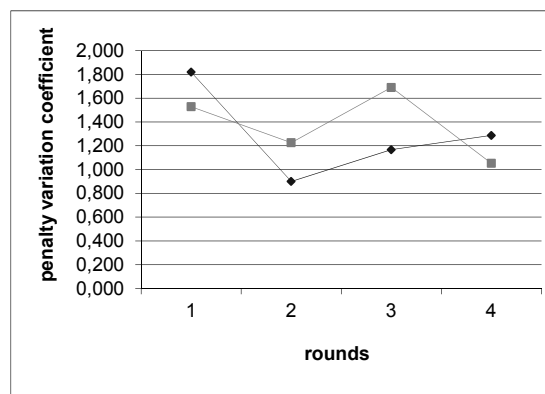
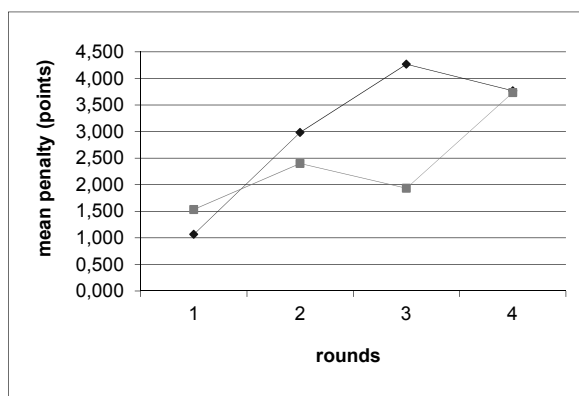
*Class B.* In this class both – significant contributions and substantial penalties for those who contribute less – were observed. Such type of behaviour can be explained by the properties of strong positive and strong negative reciprocity. The behaviour of participants is elastic by penalty points, i.e. punishment is effective. Intra-group variation of final incomes is low in the majority of the groups. However, due to diversion of re-



a) average contribution in two experiments

b) variation of contributions in two experiments

Fig. 2. Dynamics of contributions



a) average penalty

b) penalty variation coefficient

Fig. 3. Penalty characteristics (two experiments)

sources on penalties these groups have cooperation coefficient close to one.

*Class C.* This class combines those groups, which have a low effect of group cooperation ( $CE < 0.6$ ) and a significant breakaway from the previous class by final income. Members of these groups are characterized by the common property of strong negative reciprocity. There is an observed effect of desynchronization of participants' behaviour as a result of rapid and sharp reaction to penalties. We may also assume that a positive reciprocity property is characteristic for some participants, and this property is quickly actualized by the signals of the reaction of other participants. Desynchronization becomes apparent in that the participants, aiming at cooperation, impose penalties on more cautious participants, who react quickly and positively in the next period, but disappointment – likewise swiftly – makes those, who have already demonstrated their intention, reduce sharply their contributions. This is an effect of disappointment in the expectations of the participants, potentially willing to cooperate (so called “broken efforts of kindness” [2]).

*Intra-group differences.* The greatest variation in personal income takes place in the groups with the low-

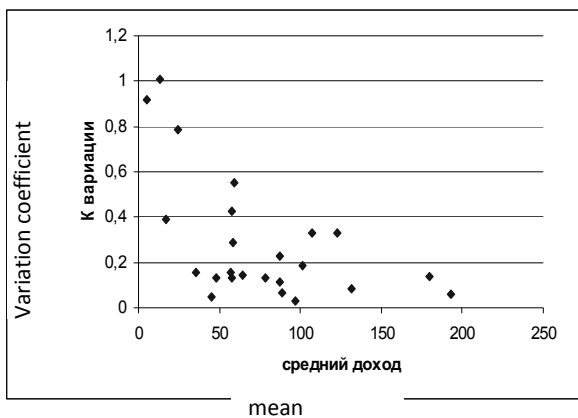


Fig. 4. The relationship between mean revenue and variation of income in the group

est average income. In all the experiments, there is a negative relationship between the average income and its variance within a group (Fig. 4). Note that the groups with low differentiation (variation coefficient  $< 0.2$ ) of incomes (almost half of the groups) are significantly different by the mean value of income: from 40 to 200 points (Fig. 4). This interval characterizes a reserve of the increase of group's income at the expense of improving the quality of cooperation – i.e. of increasing the contributions and of reducing the penalties. This increase in group's result is “felt” by all the members of the group, because it will not be accompanied by increased intra-group differences

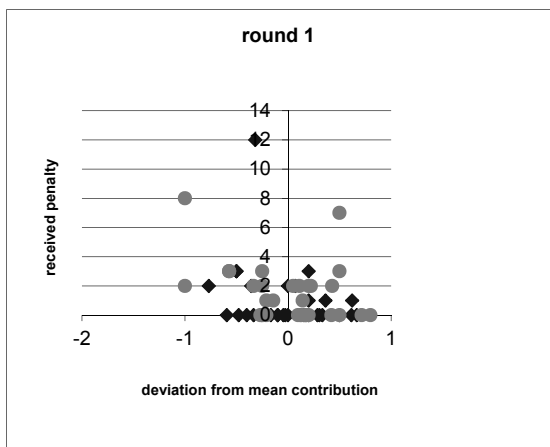
Analysis of the penalties, imposed on the participants shows that not only those who contributed less, were punished, but also those whose contribution was equal or even greater than a group's mean one, with significant changes in penalties during the game (Fig. 5).

At the beginning of the game the contributions, which are less than average, in many cases are not punished, but at the same time, both positive and negative deviations are punished approximately equally (Fig. 5a). At the end of the game the participants enhance significantly the penalties for those who contribute less than the group's average contribution is (Fig. 5b). At the same time, penalizing for the contributions, which are higher than average, remains. This character of punishment corresponds to the results of other PG experiments – i.e. the experiments, studying cross-cultural differences in people's behaviour<sup>12</sup>.

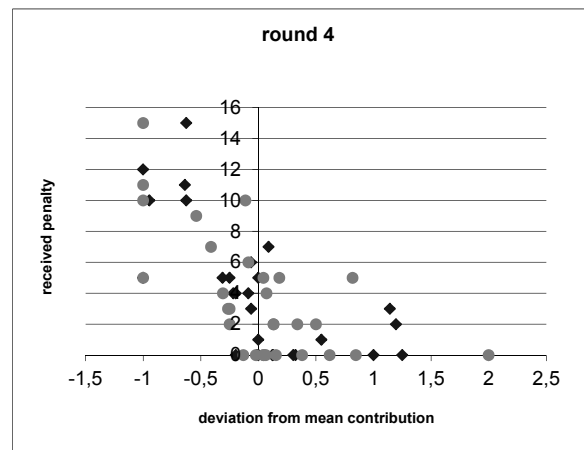
**6. Conclusions.**

The results of the experiments, which were carried out, correspond to certain results of actual research, and may serve the arguments in favour of the following conclusions.

1. A combination of willingness to cooperate, and the propensity to punish may lead to the establishment and stabilization of cooperation, but does not allow to use its potential and to obtain a significant effect, because penalty exhausts resources. It seems that just this type of behaviour, in which aspiration for cooperation is



a) round 1



b) round 4

Fig. 5. The relationship between the received penalties and normalized deviation of participant's contribution from the group's mean (two experiments)

based on the necessity and inevitability of punishment for the violation of rules, is inherent to a "post-soviet" man. This combination of properties may be one of the factors explaining the low efficiency of cooperation in post-soviet countries.

2. Another factor may be disappointment and asynchrony in behaviour of those people who strive for cooperation. Not only selfishness of "free riders", which leads to the effect of "broken hopes", but also the initial caution of individual participants within reciprocally homogeneous groups in the absence of endogenous people's motivation to cooperate, may cause weakening of cooperation - a chain reaction of "non-participation" (or the effect of "failed expectations").

3. The results of the experiment confirm the effect of a positive example: in the environment with positive reciprocity, altruistic behaviour may cause a positive feedback reaction and strengthening of cooperation.

4. Along with a tendency to punish smaller contributions, the punishment of participants with contributions, which are higher than the groups' average ones, is also confirmed. However, pure samples of antisocial punishment are unique and are observed not in all the experiments. This result and the presence of the examples of steady (exogenous) propensity for cooperation and of groups of people with strong positive and weak negative reciprocity may be attributed to the most optimistic and unexpected results of our experiments.

5. What general conclusions may be drawn from the results of our experiments in terms of the real problems of the modern economic life? In particular, in terms of tax policy the results of the experiments allow us to doubt the fact, that loosening of control and punishment is in any case leading to tax evasion widening. The fact that toughening of punishment is not efficient, automatically working means of struggle against shadow economy, has been already verified not by laboratory experiments, but by field ones in the post-soviet countries, where such measures had not yielded the expected result.

6. The observed level of inclination to free-rider behaviour is much lower than the estimated level of

shadow economy and the scale of tax evasion. This coincides with the opinion that taxpayers' opportunistic behaviour in the post-soviet area to a considerable extent is explained by the violation of the parity in the exchange of paid taxes for public goods. If citizens do not see the results of productive activity of the state, then they do not see the sense in cooperation, i.e. in participation in taxation and thus they perceive taxes as pure losses.

7. Experiments show that people may ignore the punishment of offenders, using economy on penalties, in order to participate in a joint affair, but only if they feel the multiplier effect of their cooperation. It also speaks in favour of reasonability of reduction of compulsion measures and punishment in tax policy, and in favour of promotion of voluntary payment of taxes by means of increasing of the productive role of the state and improving the quality of public goods. The greatest effect in this respect may be achieved by means of universal public goods, which have the greatest range of action, and their effect may be felt by all the citizens – these are education, health and safety, including environmental, infrastructural and other goods, ensuring high social standards. Such policy of the government will help to weaken economic agents' opportunistic motivation and to raise the efficiency of public institutions.

8. If we talk about our expectations of the experiments, the most important, perhaps, is that we've expected to obtain some quantitative characteristics, i.e. measurable manifestations of what is called a "post-soviet mentality", and use it as an explanatory factor, when there are no other arguments. Although we are only at the very beginning of the research and the obtained results rather raise questions than give us definite answers, but nevertheless if we talk about features of economic behaviour in Ukraine the first experiments allow us to hope that Ukraine has more in common with, than divergent from the developed European countries.

## Endnotes

<sup>1</sup> In neo-institutional theory opportunism is interpreted as a type of behaviour, which is aimed at individual goals achievement and is not related to moral considerations. In a broad sense opportunism behaviour means violation of formal and informal norms and rules of social behaviour by a given individual [16].

<sup>2</sup> K.J. Arrow [3, p.65] considers public goods to be a special case of a more general phenomenon, which he calls "failure of markets to exit".

<sup>3</sup> It is appropriate to cite the words of Vernon Smith: "Possibility or impossibility of reaching the optimal distribution of resources by means of decentralized pricing system depends on the assumption about the ways of economic agents' behaviour, but in any case this result doesn't depend on whether the good is public or private" [12, p.73]

<sup>4</sup> Description of different designs of this experiment and its results may be found in many sources, for example in [6, 12].

<sup>5</sup> Providing of public goods is associated with the problem of a "free rider", which is a consequence of «homo economicus» behavior model: the criterion of maximization of individual benefit creates a strong incentive of an agent to avoid participation in the expenditures, while the property of non-excludability guarantees him receiving of this good.

<sup>6</sup> The term "reciprocity" (mutuality) is used in modern sociology to describe the exchange of gifts (in detail - see [15]). This term is also used in studies of cooperation in a broader interpretation, as a tendency of individuals to interact, on

condition of a similar behavior of other members of the group, including punishment of the offenders of social standards. If this punishment is not free for those who penalize, we talk about the property of strong reciprocity, which is inherent to the behavior of an individual. Strong reciprocity indicates that an individual has not only individual values, but also social ones, which influence his behavior and his attitude towards cooperation [5].

<sup>7</sup> Summary of the results of PG-experiments can be found, for example, in [12, pp. 71-100; 6, p. 14]

<sup>8</sup> The experiments were carried out in Kharkov and Yalta, at different times and with different sets of participants (total number of participants was 105 persons).

<sup>9</sup> In [12, p. 76] one may find an example of PG-experiment with students using a bonus (a public good) in the form of a coursework assessment in a subject.

<sup>10</sup> As a characteristic of contributions dispersion a coefficient of variation was used - a dimensionless value, showing the ratio of standard deviation and the mean value.

<sup>11</sup> With the exogenous income of 20 points in each round members of a group could get at the end of the game – without their participation in the general fund – the total income of  $20 * 3 * 4 = 240$  points. Maximum group result – on the assumption of full investment of all the funds in each round into the general fund – equals to 731.25 points, i.e. in this case, the coefficient of the efficiency of group cooperation will be 3.05.

<sup>12</sup> In particular, the experiments carried out in Russia and Switzerland, have shown that in Russia not only the levels of penalties are higher, but also there is a significant punishment, even in case of large contributions (in Switzerland it is close to 0) [6, p. 14]. Judging by the results of our experiments, Ukraine occupies an intermediate position: the propensity to punish is larger than in Switzerland, but is weaker than in Russia.

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## ОПОРТУНІЗМ І РЕЦИПРОКНОСТЬ В ЕКОНОМІЧНІЙ ПОВЕДІНЦІ: РЕЗУЛЬТАТИ ЕКСПЕРИМЕНТУ «СУСПІЛЬНЕ БЛАГО» В УКРАЇНІ

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У статті представлено докладний аналіз результатів гри «Суспільне благо», яка проходила в Україні з метою вивчення особливостей поведінки, що впливають на інтенсивність та ефективність кооперації. Експериментальні результати співпадають з даними попередніх досліджень, і можуть служити аргументом для наступних висновків.



Поєднання готовності до співпраці і схильності до покарання може призвести до встановлення співпраці та її стабілізації, але не дозволяють використовувати її потенціал і отримати стійкий ефект. Враховуючи оподаткування та податкову політику, експериментальні результати дозволяють піддати сумніву те, що ослаблення контролю і покарання завжди призводить до поширення ухилення від сплати податків. Опортуністична поведінка платників податків на пострадянському просторі значної мірою пояснюється порушенням паритету в обміні сплачених податків на суспільні блага. Результати дослідження було представлено на V Всесвітньому Конгресі ISBEE (Варшава, 2012).

**Ключові слова:** "Ното есопотікус", економічна поведінка, опортунізм, реципрокність, проблема фрірайдера, гра «Суспільне благо», експериментальна економіка.

## **ОПОРТУНИЗМ И РЕЦИПРОКНОСТЬ В ЭКОНОМИЧЕСКОМ ПОВЕДЕНИИ: РЕЗУЛЬТАТЫ ЭКСПЕРИМЕНТА «ОБЩЕСТВЕННОЕ БЛАГО» В УКРАИНЕ**

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В статье представлен анализ результатов эксперимента «Общественное благо», который был проведен в Украине с целью изучения особенностей поведения, которые влияют на интенсивность и эффективность кооперации. Экспериментальные результаты совпадают с данными зарубежных исследований. По отношению к налогообложению и налоговой политике, экспериментальные результаты позволяют подвергнуть сомнению, что ослабление контроля и наказания обязательно приведет к распространению уклонения от оплаты налогов. Опортунистическое поведение плательщиков налогов на постсоветском пространстве в значительной степени объясняется нарушением паритета в обмене уплаченных налогов на общественные блага. Результаты исследования были представлены на V Всемирном Конгрессе ISBEE (Варшава, 2012).

**Ключевые слова:** "Ното есопотікус", опортунізм, реципрокність, проблема фрірайдера, експеримент «Общественное благо», експериментальна економіка.

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