Applications of Theory of Redistribution Systems to Analysis Competitivity

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Abstract

Theory of redistribution systems is an application and at the same time extension of Game Theory. It deals with functioning of institutions, establishments, firms and others social systems, in that pay-offs are redistributed in contrast to achievement of individual players. The redistribution is usually allowed by a coalition, formed inside of redistribution system, that disposes of dominance over the pay-offs' redistribution. Redistribution equation describing all possibilities of pay-offs' redistribution in Elementary Redistribution System and enabling to create and to test a computerized model of Elementary Redistribution System. Based on that, it is possible to model different types of bargaining, kinds of equilibrium – included Pareto optionality and Nash equilibrium – and in connection with it also chaining of simple redistribution systems into the combined ones.

Keywords: *game theory, Theory of Redistribution Systems, competition, redistribution equation, coalition, bargaining, Pareto optionality, Nash equilibrium*

JEL Classification: D01, D33, D74

Introduction

Frequently and in various areas of social life, we encounter the fact that those who enforce their decisive influence here are not interested in efficiency of the system operation but in their own profit, their standing and the income associated therewith. Theory often overlooks this fact and comes with proposals for improvement and finally, it is taken by surprise that the recommendations are disregarded. Regarding the issues mentioned above, the only thing remaining is the game theory. Contrary to other social-science disciplines, it does not describe how reality should be (the best situation) but how it all ends up (who wins or loses and how much). The theory of games can sufficiently reply to the question

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why something that may be reasoned as correct and necessary hits various – mostly of interest – barriers in the process of realization.

Let's consider a specific context leading to establishment of the above-mentioned issues presented here. We came to the conclusion when working on the GA ČR Investing into Social Capital and Efficiency[1] that the existing game theory system is insufficient for the precise identification and quantification of the social capital and that a new system called the "theory of redistribution systems" will need to be defined to conform to the goals specified in the grant project. Working from this original and prospect extension of the game theory is considered one of the main benefits of the existing project management.

So far, game theory has not worked out a functional model establishing a direct relation between the redistribution level within a system and its performance. An example may be a classic work by (Tullock, 1997). His redistribution models use game theory but covering neither the issue of forming coalitions associated with discrimination of players ending up outside the winning coalition, nor the effects of redistribution on the system performance. Neither does (Osborne, 2004, pp. 467 – 469), closely engaged in the issues of negotiations towards the redistribution of means, consider the effect of redistribution on the change to the system performance. The analysis of this relation is neither found in international journals devoted to games theory.[2] The condition of the system (organization, etc.) performance drop due to deviation in distribution of pay checks depending on the player's performance is substantial. Without it, it would not be possible to analyze the consequences of many important effects involved in the system, e.g. the role of competition, the development of systems over time or inter-organizational migration, i.e. the chance of a player to go over from one system to another, the effect of unpredictable events on changes to the player performance, etc. Let's focus on the competition role in this paper. Since 2009, another GA ČR project is being executed, this time directly dedicated to the theory of redistribution systems.[3]

1. The Model of an Elementary Redistribution System

The position inside social systems (structures or networks) becomes a social capital that comes through as capital and may be valued as capital based on the analysis of redistribution processes and the effect of the positions on redistribution

[1] The project was managed under No. 402/06/1357 in 2006 – 2008 at The Institute of Finance and Administration (VSFS) in Prague.

[2] Certain relevance with the issues discussed here may be found in some articles published in the Game Theory journal, e.g. Messner and Podhorn (2007); Watts (2007).

[3] The project Theory of Redistribution Systems solved under No. 402/09/0086.

processes. The more the distribution of means inside of the social systems of the type mentioned above collides with appreciation of the system maker's performance, the lower the total performance the system attains. A typical cause of redistribution inside the systems is that there is a certain power-holding coalition misusing its dominant influence on the redistribution of means the organization gets in its favour. It also applies to a managed organization where a person deciding on distribution of pay checks is appointed to the position and has either unlimited or significant powers.[4] The approach requiring development of one's own mathematical system is called "the theory of redistribution systems". It is one of the game theory cases.

We have called the systems of the above stated type (i.e., in which coalitions can form that have an impact on the redistribution of means, and in which this redistribution is reflected into the performance of the system) as 'redistribution'. A general redistribution system has a simple scheme:[5]

1. A set of entities participates in the creation of new measurable values.

2. The sum of the created values is assigned once again to entities. In this assignment, the fact that what a given entity created must be received back by it does not have to hold.

The problem of redistribution consists precisely of the re-assignment of values to entities.

The theory can be constructed both statically as well as dynamically. It is possible to enter other aspects, such as the formation of entity coalitions, negotiations, etc.

Let's designate, in agreement with results so far:

a_i – the value created by entity *i,*

x_i – the value acquired by entity *i* after redistribution.

If we designate with the symbol x^* the sum of all variables x_i across all i, then it is possible to consider the variables a^*, x^* and their difference $d^* = a^* - x^*$. Because it is not possible to assign more than a^* we get

$$a^* - x^* = d^* \geq 0 \tag{1}$$

where we consider $d_i = a_i - x_i$. We introduce a negative function R, which is dependant on the differences d_i, such that holds

$$d^* = \eta \, \mathrm{R}(-d_1, -d_2, ...) \geq 0 \tag{2}$$

[4] These issues are omnidirectionally noted by e.g. Čakrt (2000), Eucken (2004) and Štědroň (2007).

[5] The presented formalization was proposed by Bohuslav Sekerka, who is a co-researcher of the Theory of Redistribution Systems GA ČR project.

where η is the parameter expressing the performance of the redistribution system and R is the function of the difference of payouts after distribution from the payouts according to the performance of the individual entities.

If $\eta = 0$, then the decrease of performance, with any deviations of d_i, does not occur during redistribution, and thus must hold

$$x_1 + x_2 + ... = a^* \tag{3}$$

Furthermore, selected approaches in negotiations and in the formation of coalitions were considered. This brings dynamics into the system.

A formalized model of the elementary redistribution system has been created to analyze standard situations occurring in redistribution systems. It was defined to be the simplest and most illustrative. Therefore, it has three players only (A, B, C); their performance is divided in the ratio of small and easy to imagine numbers 6 : 4 : 2**,** each of the system participants (player) has an identical chance to influence the result (i.e. the influence power equals 1).[6] The basic parameters of the model can be generalized easily.

One of the first steps of the redistribution system analysis was compiling a redistribution equation describing all possible distributions of pay checks within the elementary redistribution system. For the elementary redistribution system, the following definition may be used:

$$x + y + z = 12 - \eta \,.\, \mathrm{R}(x - 6, y - 4, z - 2) \tag{4}$$

where

$x + y + z$	– is the summary of actual pay checks to individual players;
12	– the maximum remuneration that may be distributed should the redistribution system performance be maximum, i.e. no redistribution but distribution of pay checks according to performance;
η	– the performance drop coefficient;
$\mathrm{R}(x - 6, y - 4, z - 2)$	– the distance function (difference) between the actual pay checks and the performance-based pay checks.

The redistribution equation can be interpreted as follows: The amount the players may distribute equals the amount they might fully distribute less the distance from the performance-based distribution. The distance function R can be defined differently, the most suitable is standard metrics as the root of the sum of the squares of differences between the optimum performance-based pay checks and the actual ones (positive values are considered only):

$$\sqrt{(x-6)^2 + (y-4)^2 + (z-2)^2}$$

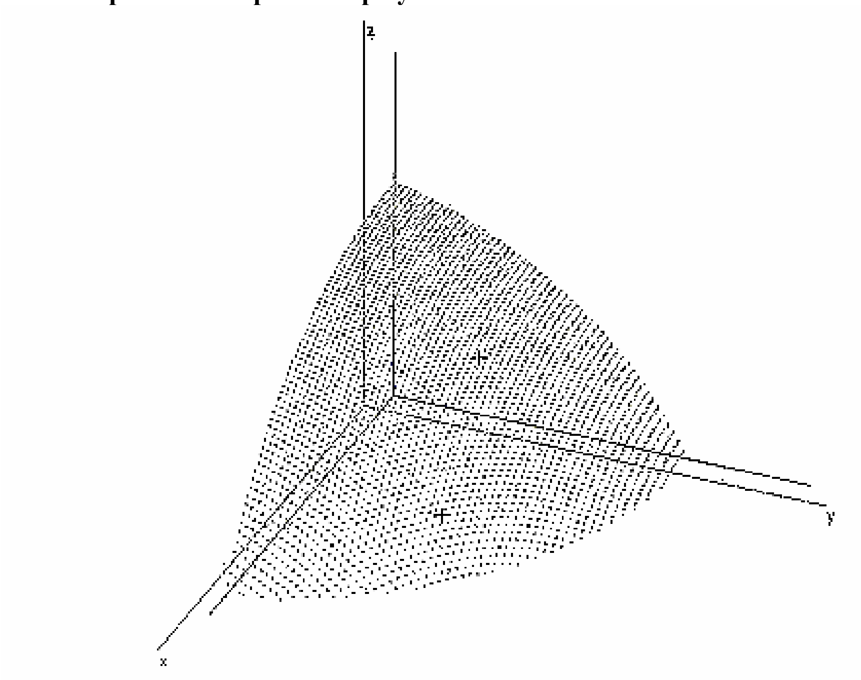
[6] For details, see Wawrosz (2007).

A mathematically sound analysis of the elementary redistribution system is extremely important for two reasons. The first, investigating various types of spreading of the elementary redistribution system and the second, investigating how the plain elementary systems are strung into more complex ones. Each equilibrium within a simple redistribution system is unstable and results in stringing of plain systems into hierarchy – and network-based structures.

The analysis of the redistribution systems shows that the system parameters are often the origin of what may be considered an external influence (e.g. personal affection).[7] A mathematical model was developed for this purpose, followed by a computer model where the situations may be simulated and the way of analysing hidden layers of the issues may be cleared. The model enables a description of different negotiation types and the results of the negotiations are displayed as a negotiation trajectory on the redistribution plane.

G r a p h 1

An Example of a Computer-Displayed Redistribution Plane



Source: Own creation.

[7] In relation to the solution of a similar type of the task (collusive oligopoly consisting of five players), Maňas (2002) notes the following after presenting all equilibrium situations: *"A contract negotiation is usually time consuming and should a contract be signed after general negotiation fatigue, it is mostly due to personal affection than a consequence of logical considerations."* (p. 61) However, we can go further in the field of the redistribution systems and see what the grounds of seeming personal affections, etc., are.

Graph No. 1 shows an example of a computer-displayed redistribution plane for the η performance drop coefficient of 0.5 and R defined as the root of squares of the deviation of redistribution from the performance-based pay check. Let's assume (and below as well) that the lowest pay check value of a player who is outside the coalition (i.e. of those being discriminated) equals 1. The lower cross shows a point with coordinates (6; 4; 2), i.e. the performance-based pay check distribution point, the upper cross shows the point when each player gets an equal pay check, which is roughly 3.51, i.e. the coordinates are (3.51; 3.51; 3.51.) All redistribution planes must go through the points. The point of coordinates (6; 4; 2) has the highest sum of pay checks of all players. The further from this point, the lower the sum of the pay checks.

2. Discrimination and Nash Equilibrium in the Redistribution Systems

Let's now look at one of the very specific and handy conclusions we can attain using the analysis of the redistribution plane. At first sight, the redistribution plan looks symmetrical from the coalition's formation point of view. The best performing player (A) may join the average player (B) and they will both profit at the expense of the weakest player (C). Similarly, player B may join player C and profit at the expense of player A. Then there is the third option; players A and C will join and profit at the expense of player B.

Everything seems different if we ask: What coalition will be profitable for each individual player forming this coalition? Let's assume that the coalition-forming players will distribute their pay checks to attain the maximum sum. Then the answer is easy. Player A will profit more if joining player C and not player B. Similarly, player B will profit more if joining player C and not player A. And finally, player C will profit most if joining player B and not player A. The most supported case is the coalition between players B and C and they will profit most at the expense of the best performer. There is no other case where two players will profit more. At the same time, the system performance will drop most.

The results? Should the system not be exposed to competition or any other factor involving all the players in achieving maximum common performance, it is highly likely that the coalition will be formed by average and under-average players and the best performers will be discriminated. Due to the effect of many other factors of a rather psychological character, not randomly the ambitions of an average individual to control the field with the help of weaker players are shown as the leadership phenomena.

However, the best performer is not totally defenceless against the coalition. The best performer may underbid the weakest player, i.e. s/he can offer more than in the case of coalition between the weakest and average player.

The elementary strategy of negotiations in an elementary redistribution system can be defined in the following way:

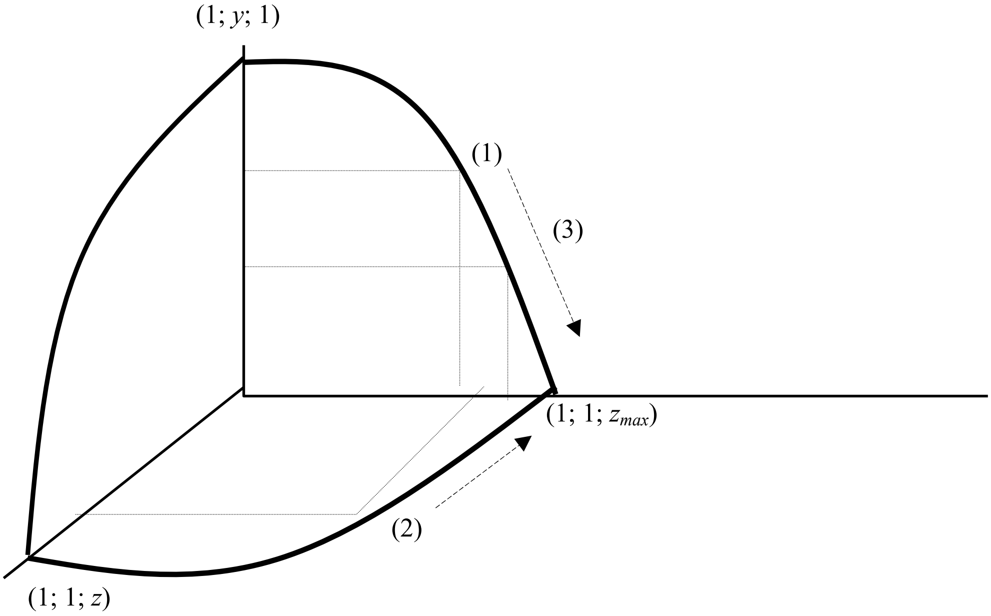
- The principle of forgone opportunity holds; i.e., if the transformation of one coalition into another is to occur, then each of the players forming the new coalition must improve his payout.
- Each player knows all allowable combinations of payouts (which lie in the redistribution space and are given by the redistribution equation).
- Negotiation is always initiated by the player that is discriminated against (i.e., is outside of a coalition).
- This player knows what the payouts of the other two players are, and on the basis of this he is able to also determine what payout he would have in a coalition with each of the players of the existing coalition, if his payout (i.e., the payout of the corresponding player that forms the existing coalition) did not change.
- He will offer the creation of a new coalition to that player with whom he would have a larger payout, if the size of the payout of the player, to whom he is offering the formation of the coalition, remained the same.
- To him, he will propose a payout that is equal to the percentage share (e.g., the average, i.e., 50%) of the difference between the largest and smallest possible payout that he can attain in the new coalition under the assumption that the principle of the costs of foregone opportunity will be in effect for him as well as for the second player in this coalition.
- From his payout, he will deduce the size of the payout of the player to whom he offers the formation of the coalition, and this player accepts this offer.
- The discriminated player then becomes that one, who will now offer the formation of a new coalition according to the same rules.

The goal is an analysis of the model's behavior in the case of various modifications and the expansion of the elementary negotiation strategy. The agreement of the average and weakest player followed by underbidding by the best performer can be depicted as follows (placement of the coordinate axis is selected for better illustration).

Should the underbidding continue in the direction of the arrows, we get to the point (1; 1; z_{max}) where the weakest player has the highest pay check possible and both the remaining players have the lowest, i.e. equal to 1. However, this is an unattainable point (not accessible because two players would get worse from any other point). Instead of mutual underbidding to the weakest player, the best performer and the average player may join and get profit when compared to previous agreements they each have with the weakest player.

Graph 2

Depiction of the Agreement between the Average and Weakest Player Followed by Underbidding by the Best Performer



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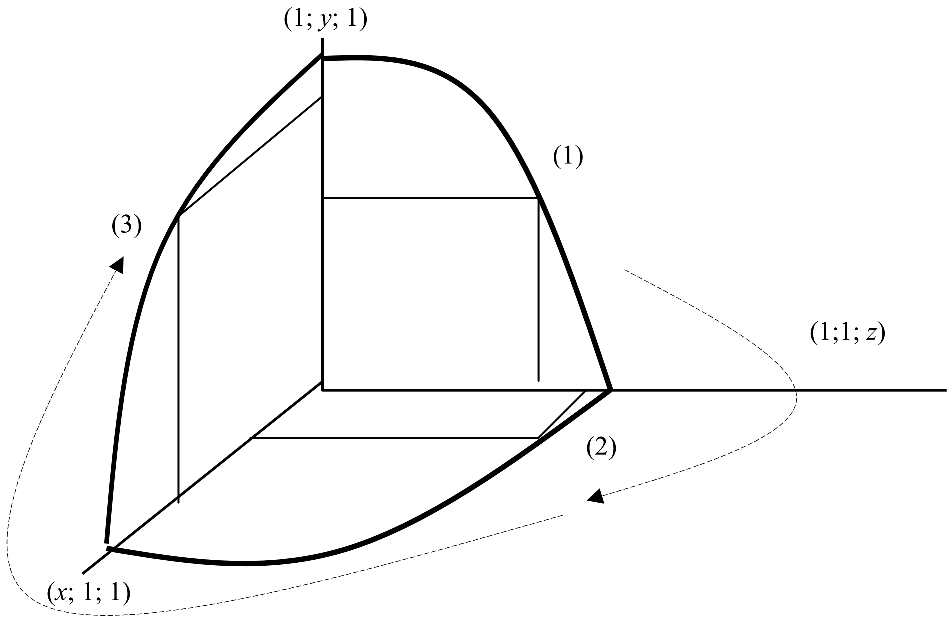
Graph 3

Agreement of the Best Performer and Average Player which is Profitable for Both when Compared to the Agreements they Have before with the Weakest Player



*Source:*Own creation.

(1) it shows the first agreement between the average and the weakest player;

(2) it shows the agreement offered by the best performer to the weakest player as an alternative;

(3) it shows the agreement between the best performer and the average player to get profit as an alternative to the first and second agreement they both have with the weakest player.

From the individual player's point of view, the agreement with the other player rather than with those with whom the coalition has currently been formed with relevant pay check distribution, is a sacrifice opportunity. Instead of mutual underbidding to the weakest player, the best performer and the average player may join and get profit when compared to previous agreements they each have with the weakest player. Because all players may underbid in this way, there are finally the three following equilibrium situations where two players discriminate against the third one. These are discrimination equilibriums. Should there be no external influences (e.g. affection or trust between the players), the conclusion of any equilibrium is equally likely. There is an important conclusion from the above:

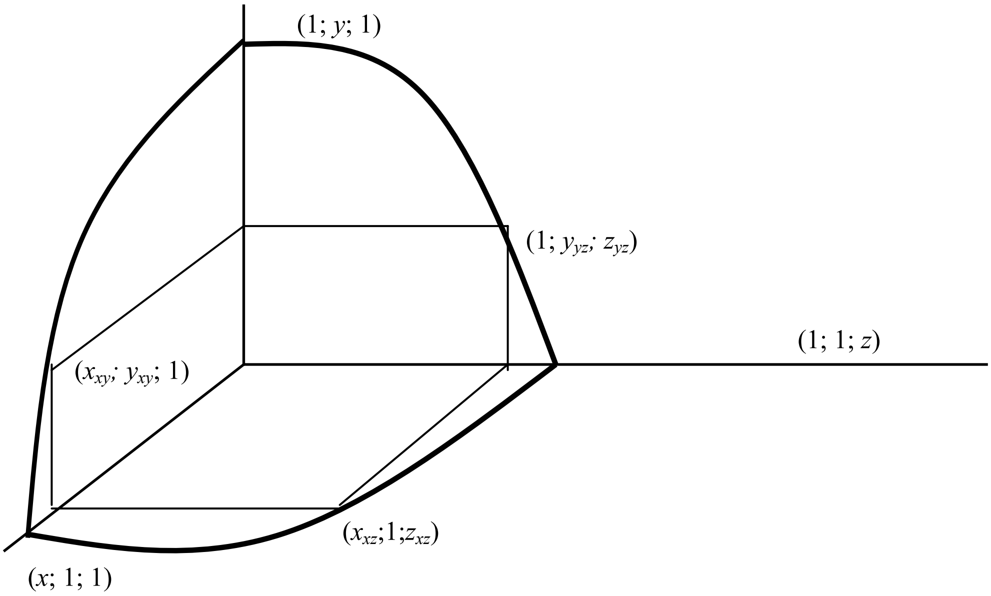
- Should any player attempt to negotiate better conditions (higher pay check) in negotiations with the other player, s/he would influence the situation so that the coalition is formed without her/him and s/he would finally be the one discriminated.
- Should, on the contrary, s/he attempt to be involved in the coalition to avoid herself/himself being in the position of the discriminated, the offer of a higher pay check to the potential coalition partner (i.e. the underbidding) provokes underbidding of the third player as well and the negotiations may restart again.
- In other words – there are three discrimination equilibriums in the elementary redistribution system for which the following graphical as well as mathematical representations are valid.

The key for finding equilibrium situations in the underbidding negotiation is the following consideration: Should there be an agreement between the weakest and average players, the agreement has parameters $(1; y_{yz}; z_{yz})$, i.e. it is equal (equilibrium regarding the pay check for the weakest player) to the agreement between the best performer and the weakest one with parameters $(x_{xz}; 1; z_{xz})$. The following must be valid – $z_{yz} = z_{xz} = \text{def} : z_u$ (the z value must be the same either resulting from the negotiations between the weakest and average or the weakest and best performing player; we can identify it equally, e.g. z_u, where the u index is the underbidding); $x_{xy} = x_{xz} = \text{def} : x_u$; $y_{xy} = y_{yz} = \text{def} : y_u$.

(Should any player want a pay check in negotiations with another player higher than that corresponding to the p-index identified one, the second player would join the coalition with the third player.)

G r a p h 4

Equilibrium Situations when Negotiating in the Form of Underbidding



Source: Own creation.

The following system of equations follows:

$$1 + y + z = 12 - \eta \,.\, \mathrm{R}(5; y - 4; z - 2) \tag{5}$$

$$x + 1 + z = 12 - \eta \,.\, \mathrm{R}(x - 6; 3; z - 2) \tag{6}$$

$$x + y + 1 = 12 - \eta \,.\, \mathrm{R}(x - 6; y - 4; 1) \tag{7}$$

These are three independent equations with three variables of which solution are the values sought for. What sense does this solution have? It shows three equilibrium points with the following coordinates:

(1; y_p; z_p) – the A player is outside the coalition and discriminated

The following values correspond to it:

- the A player is outside the coalition and discriminated: (1; 4.71; 3.63) of total performance 9.34;
- the B player is outside the coalition and discriminated: (5.65; 1; 3.63) of total performance 10.28;
- the C player is outside the coalition and discriminated: (5.65; 4.71; 1) of total performance 11.36.

The Nash equilibrium can be calculated from the values given. The ratio of the average player's pay check (summing of the value of 1 and two values corresponding to the winning coalition all divided by three) is substituted to the redistribution equation. The solution of this equation is just the Nash equilibrium. In this case, the values are: x_n = 4.39; y_n = 3.73; z_n = 2.94. (Not the numerical results but demonstrating the capability of the calculation is important here.)

To demonstrate that this is a real Nash equilibrium, let's mention one of the definitions: *„In a Nash equilibrium the players in a game choose strategies that are best responses to each other. However, no player´s Nasch-equilibrium strategy, or more simply their Nash strategy, is necessarily a best response to any of the other strategies of the other players. Nevertheless, if all the players in a game are replaying their Nash strategies none of the players has an incentive to do anything else.“* (Carmichael, 2005, p. 36)

Should any player want to improve his/her pay check – either by forming a coalition by underbidding to any player while discriminating the third one or by a request for a higher pay check – s/he gets the contrast – his/her situation will get worse. You can see that should players B and C be successful in eliminating player A from the negotiation process, their pay check would be higher than in the case of the Nash equilibrium calculated. There is an important result saying that in real systems, you can encounter situations where the best performer is pre-deprived of participation in the negotiations on winning out.

3. Extension of the Elementary Redistribution System and the Effect of a Competitive Environment

The principles of calculation of the Nash equilibrium can be transposed into situations extending the elementary redistribution system, e.g. when:

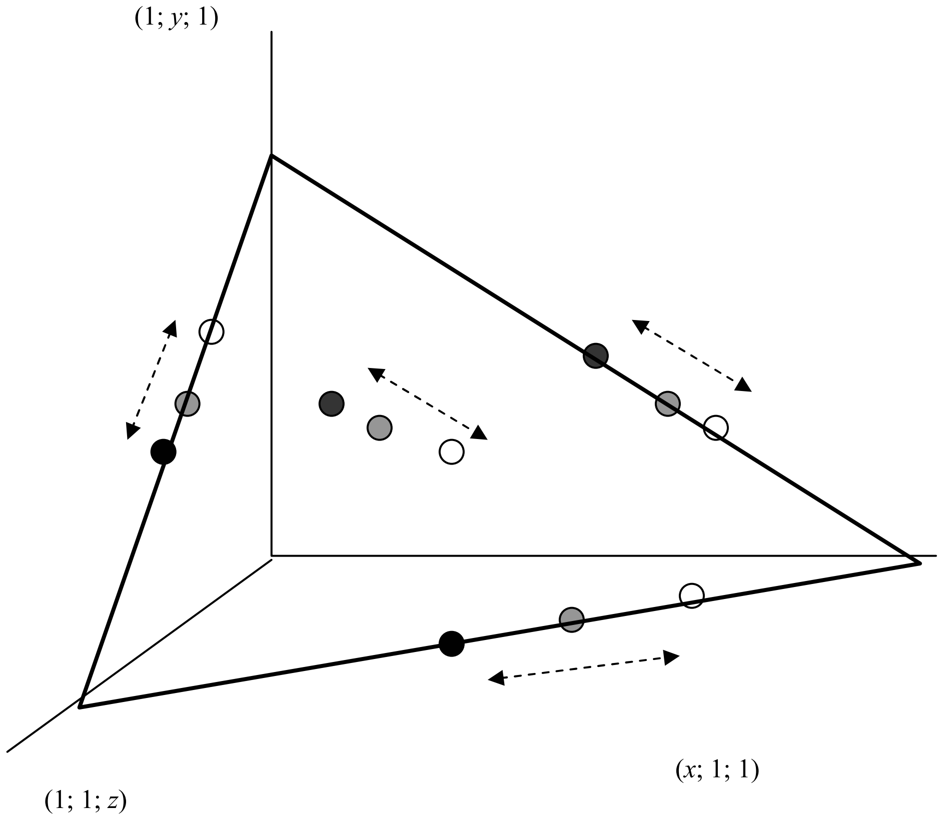
- There is competitive pressure on the system.
- The system develops (grows) over time and a comparison to other systems is done.
- There is a reverse effect of the income on the negotiation position of the players (their ability to influence the redistribution).
- There is an inter-organizational migration.

It can be expressed in all the cases above what the effect of the relevant expansion of assumptions is on the negotiation position of the players and how the discrimination equilibriums as well as the Nash equilibrium will move. The discrimination equilibriums of a similar type and the Nash equilibrium exist in more complex systems as well, where there are relations developed between areas with effective competitive pressures and areas where the competitive pressures are limited and where there are inter-organizational migration possibilities. Generally speaking, the evidence of the existence and demonstrating the calculation possibility of the Nash equilibrium in the elementary redistribution system is the key to the identification, description and potentially the calculation (when the system parameters are quantified) of the Nash equilibrium in more complex redistribution systems. There can be a general methodology for analysis of various factors influencing the shift of equilibrium types. Should there be more players in the system, there will be more points of discrimination equilibrium and one Nash equilibrium.

Should the system be positioned e.g. in a competitive environment, both the discrimination and Nash equilibriums will tend to shift towards the performance-based distribution. However, a new question will emerge here. What hinders the competitive effect results in distribution right in the 6 : 4 : 2 ratio according to the performance of the players? What allows a system exposed to competition to retain certain redistribution elements? In real applications, illustrative imagination of what happens due to individual effects influencing the system plays an important role. We have created a simplified scheme for this purpose (see Graph 3).

Graph 5

Various Equilibrium Types in the Elementary Redistribution System



Source: Own creation.

Where:

– A triangle is used for definition of a simplified shape of the redistribution plane, i.e. a set of all possible redistributions.
– Thin lines are the coordinates representing pay checks of the players.
– ○ is a point corresponding to the performance-based distribution of the pay checks in case of the discrimination equilibrium (if on the limit line) as well as in case of distribution according to the performance among all the players (if inside the redistribution plane).
– ◍ is a point corresponding to the discrimination equilibrium (if on the limit line) or the Nash equilibrium (if inside the redistribution plane).
– ● is a point corresponding to the egalitarian distribution of the pay checks in case of the discrimination equilibrium (if on the limit line) as well as in case of distribution according to the performance among all the players (if inside the redistribution plane).
– The arrows show potential shifts of the discrimination equilibrium and Nash equilibrium in case of various external influences affecting the redistribution system.

Should the system be exposed to competition and developed over time, it may “survive” (i.e. stay in the competitive environment) on the long-term horizon only provided the 6 : 4 : 2 distribution is employed. In other words, if a pure model is taken into account, the more the distribution approaches the 6 : 4 : 2 distribution, the higher the performance and the more dynamic the development. The more dynamically developing systems would win in case of very generally assigned parameters. Some other effects such as inter-organizational migration would strengthen the effect of the competition. There is a question emerging of what other influences suppress the effect of the competition in the redistribution of means inside systems of various types. An approach focused on development of a full and well-structured listing is suitable for resolving this problem[8] – effects either strengthening or weakening the effect of the competition in this case. We successfully identified the following effects:

1. The effect of the competition on the shift towards performance-based distribution is strengthened by:

- Possibility of inter-organizational migration or possibility of the best performers to move to systems where pay checks are performance-based.
- Possibility to exclude poor performers from the system.

2. The effect of the competition on the shift towards performance-based distribution is weakened by:

- Impossibility of sufficiently awarding the performance of individual players.

[8] We often encounter the need to compile a full and well structured listing for resolving many problems. One of the procedures trying to create a full and best structured listing is the SWOT analysis.

- Existence of direct or indirect redistribution between competing systems due to the existence of higher-system entities being able to execute such redistribution (which may be e.g. a superior level in the company management, state administration e.g. in relation to the differentiated approach in the assignment of public tenders).
- Complementarities of the players' performance types and limited possibility of their substitution.
- Existence of a network connection of some players with the external environment (which may be understood as the existence of cross coalitions, i.e. coalitions between individual redistribution systems) that strengthens the possibility of these players to influence the result of the game.
- Possibility of foreseeable and unforeseeable change to the player's performance (due to higher qualifications, natural ageing process, innovations changing the structure of the applicable competencies, etc.).

3. For the competitive influence, the possibility of investing the pay checks achieved into the system position, i.e. into the possibility of influencing the form of coalitions and subsequently the redistribution in the next round operates dually (it increases its influence to a certain extent and vice versa).

4. One of the Applications of the Existing Results

Each step in the theory development usually has a double end: First, it is used for further development of the theory and second, handy relevant results may emerge. The ratio between the ends differs. There are cases where the move in the theoretical part is important for further theory development steps only. However, should we work with a substantial simplification of the reality and strive to capture the most important in reality by successive enrichment of the elementary (intentionally simplified) model, it is a good idea to successively search for an interpretation of useful and practical results. It helps to correct the heading towards the next steps, brings impulses as well as necessary corrections.

Also, the practical use of theory has various forms as well. It is possible to distinguish between the theory role in preparing and executing various projects (including e.g. reforms of economic and social subsystems of society) from the theory role in cultivating human's ability to perceive social reality (and to streamline the decision-making process conditioned by experience and interests).

Mastering a certain part of the theory, a certain theoretically well-proved concept allows the human to capture better that part of social reality the theory is dealing with, to capture the most important, to evaluate correctly and to adopt adequate suitable decision.

What do the results presented by us show? Let us try to present them with respect to applicability in evaluating the situations we encounter in the area where we apply our abilities. Virtually each redistribution system includes negotiations on forming coalitions and the distribution of pay checks not only in clear or official forms but continuously and spontaneously; it is contained in dialogues among the players (which are employees of an office or members of the organization we are working in). It particularly applies to supporting the argumentation of which individual forms can be classified well and used to support coalition forming as well as influencing the pay checks inside the coalitions.

The projection of individual equilibrium types (the discrimination and Nash equilibriums) as well as their shifts due to individual influences on the system enables good reading of the matters of interest in the dialogues, how and why people judge themselves and others.

Spreading individual equilibrium types has a strong importance from another point of view. The players may use strategies as far as coalition forming is concerned:

- Focus on forming one certain coalition and the enforcement of a certain discrimination equilibrium.
- Striving to be involved in forming various coalitions leading to the establishment of the discrimination equilibrium, to use knowledge in negotiations on each of them and to reinforce the position in negotiating another coalition.
- To operate as a "neutralizing" elements attempting to stand outside the coalition forming process and to rather contribute to drawing the distribution system closer to the Nash equilibrium.
- Not to intentionally join the negotiations about forming coalitions and redistribution within the system, to stand outside and mind one’s own business.

A little experience allows you to distinguish who uses what strategy and to estimate the system development. The illustrative projection and shifts to individual equilibrium types (graph 5 is a very suitable tool and support for their establishment) due to various effects and therefore, the forecasted effect of the use of additional arguments for negotiations on conditions has one more practical aspect. Those knowing how to estimate the manner of negotiations will undoubtedly mention some more system shifts against what can be forecasted. The root cause is not usually the lower rationality level of the players and hence higher proportion of their unpredictable behaviour. The systematic shifts of the negotiations results from expectations usually reveal the existence of outer effects in the form of the network connection of individual players with the environment, or the existence of concealed cross coalitions between redistribution systems.

Generally, the role of social networks influencing the negotiation results inside individual relatively independent systems (of the redistribution system type) is very strong and increases. It is good to expect it. Confronting the model in the form of illustrative projection about the way of creating different equilibrium types within the redistribution systems with the reality in specific organizations or institutions enables the forecasting of related links, identifying and correcting strategic behaviour with respect to their existence and parameters.

The topic of redistribution systems resolved in parallel with the development of an original mathematical model opens up a potential scientific area. The results so far are probably just the tip of the iceberg. Therefore, and from the perspective of practical importance outlined here, cooperation in this area is highly welcome.

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