

What are the Causes of Disturbances of Morality in Redistribution Systems

Jaké příčiny má narušení morality v redistribučních systémech

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Abstract

A redistribution system has two main attributes: 1. The greater the deviation of the payout of players from their performance, the greater the decline in the performance of the system. 2. The cause of this deviation is the formation of coalitions that treat their members preferentially and discriminate other players. If the players in these systems focus on the formation of discriminating coalitions, the system converges towards oscillating between discriminatory balances. But there is a strategy that leads to the attainment of a mutually acceptable balance, in which each of the players improves his / her position in comparison to the average payout that he/she would get when using a strategy based on the formation of discriminating coalitions. In systems of the given type this can be considered as the objective foundation of rationally justified morality. The stated finding is important and opens the way to revealing what in reality most prevents the attainment of a balance that is acceptable for everyone. It turns out that this factor is parallel redistribution games. The revelation of their role as well as their classification and description of some of them is of significant importance to managerial practice.

Keywords

game theory, redistribution systems, negotiations, coalitions, discriminatory balance, mutually acceptable balance, parallel redistribution system, rationality and morality

Abstrakt

Redistribuční systém má dva hlavní atributy: 1. Čím větší je odchylka výplat hráčů od jejich výkonnosti, tím více poklesne výkon systému. 2. Příčinou této odchylky je vznik koalic, které zvýhodňují své členy a diskriminují ostatní hráče. Pokud se hráči v těchto systémech orientují na vytváření diskriminujících koalic, systém konverguje k oscilaci mezi diskriminačními rovnováhami. Existuje však strategie, která vede k dosažení společně přijatelné rovnováhy, ve které si každý z hráčů polepší oproti průměrné výplatě, kterou získá při uplatnění strategie založené na vytváření diskriminujících koalic. To lze v systémech daného typu považovat za objektivní základ racionálně zdůvodněné morality. Uvedený poznatek je významný a otevírá cestu k odhalení toho, co v realitě nejvíce brání dosažení společně přijatelné rovnováhy. Ukazuje se, že jsou to paralelní redistribuční hry. Odhalení jejich role i utřídění a popis některých z nich má značný význam v manažerské praxi.

Klíčová slova

teorie her, redistribuční systémy, vyjednávání, koalice, diskriminační rovnováha, společně přijatelná rovnováha, paralelní redistribuční systém, racionalita a moralita

The article *Redistribution Systems, Cross-Coalitions among them and Complexes of Memes Securing their Robustness* (Budinský-Valenčík 2009a) published in the ACTA VŠFS 1/2009 journal presented the first version of the description of the negotiations process in redistribution systems³³¹. This description was subsequently presented much more precisely (Budinský-Valenčík 2009b). The mathematical description of the negotiations process made it possible to build a computer model, which became a very effective tool for analyzing redistribution systems.² This opened the way to formulating one of the most interesting and most important problems the theory of redistribution systems has encountered so far.

In the first approximation the problem can be presented as follows: Do an objective foundation of moral behavior based on a rational approach and a negotiations strategy, corresponding to this exist in redistribution systems? The question can also be reformulated in a different way, and that is whether it is possible to find and define such a negotiations strategy that would be “stronger” (in the sense that it would make it possible for each of the players to attain a more favorable outcome) than a strategy based on negotiating discriminatory balances.

If such a negotiations strategy could be found, it would have considerable significance for the understanding of the motives of human actions. And not only by proving that moral actions in systems that can be classified as redistribution systems have a backing in rational choice and rationally substantiated actions. At the same time it would also open the way to revealing what disturbs the mutual harmony of rationality and morality, i.e., what the cause of both irrationality as well as immoral behavior is.³⁵³ In the paper it is shown and proven that a rational foundation of morality exists in redistribution systems. Some of the most significant causes of the disturbing of morality in these systems are then identified. Reaching these goals was made possible by – and at the same time also required – proceeding in two directions:

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- 1 *A redistribution system has two main attributes: 1. The greater the deviation of the payout of players from their performance, the greater the performance decrease of the system. 2. The cause of this deviation is the formation of coalitions that give preferential treatment to their members and discriminate against other players. Since 2009 this issue is being dealt with by a team working within the scope of the GACR Theory of Redistribution Systems Project (maintained under number 402/09/0086), of the Specific Research at Universities supported by Ministry of Education of the same name, which also includes students (specifically I. Stáňa and O. Zhylinkov), and the project of IGA - University of Finance and Administration.*
 - 2 *The computer model of an elementary redistribution system was created by a member of the team handling the GACR Theory of Redistribution Systems Project, P. Vávra. He first published it in a complete form within the scope of his diploma thesis at the University of Finance and Administration in 2009 called “Software for the modeling of redistribution systems”. The thesis received the prize of the University rector for the best diploma thesis.*
 - 3 *The outcome is also expected to contribute to a deeper analysis of conditions for the replication of blocking memplexes, see (Budinský-Valenčík 2009b, pp. 42-45).*

- Putting the basics of the theory of redistribution systems (a fuller reflection of what makes this type of N-coalition games specific) into more precise terms.
- Obtaining additional valuable findings related to what role is played by an abstract (mathematically defined and executed on a computer) model in deciphering human behavior.

There are certain doubts in professional sphere about the possibility of using the mathematical model for expressing of “irrational” human behaviour. Therefore we are firstly bringing out a particular example from the field of game theory with two players, i.e. from the different field than our mentioned problem of redistribution systems is. We are doing that because the particular example is authentic and it clearly illustrates how to subsequently express what seems to be “specifically human”, “humanly irrational” etc. We will apply the approach based on a continuous completion of the basic model for finding an answer for a question if there exists the possibility of reciprocally acceptable agreement in systems with more players, how they can reach the agreement and under what assumptions. We will show based on the evaluation of obtained outcomes that the possibility of achieving jointly acceptable agreement (and with it related equilibrium) is the mostly disturbed by the existence of parallel redistribution games. Wide range of practical conclusions appears from the identification of the existence of parallel redistribution games. We present some of them in the end of the article.

How to express “irrational” human behavior precisely

Before we begin “deciphering” how humans behave in a certain redistribution system, we will show (in the form of an example illustrating the most important aspects) a similar problem in a different area. A “Generally Popular Error” (in the meaning used by the writer Ludvík Souček) is that humans behave not only irrationally but also based on their human weaknesses, which no theory is able to describe suitably. For example, the pioneer in research in the area of game theory in the Czech Republic, M. Mañas, in connection with the solution of one of the typical problems of game theory (collusive oligopoly consisting of five players) after he presents all equilibrium situations notes: *“Contract negotiations are usually lengthy and if a contract is signed after general fatigue from the negotiations, it is most likely under the influence of personal sympathies rather than logical considerations (underlined by P. B. – R. V.)”* (Mañas 2002, p. 61) Similarly in a text by A. Michl “How to distribute intergalactically blocked 100 CZK?” published on May 22, 2009 in a blog on [Aktualně.cz](http://Aktualne.cz)⁴ the following is stated:

“Task: Divide 100 CZK that you have found with an unknown person. You propose the ratio of your shares. You have one chance to make an offer. If the other party refuses, nobody gets anything. If the other party agrees, it will be as you said. What do you do? I say that I take 80 crowns and give you twenty crowns to go buy a small beer. Do you take it? According to theory you should maximize utility. So the twenty is great, no? But let’s be frank, would you really accept the offer? When I did this experiment at the best student pub in London, “The

4 The text can be found at the following address blog.aktualne.centrum.cz/blogy/ales-michl.php?itemid=6643 For interest’s sake - since the text was published it was read 1,739 times, which is a very high number of visits.

Quad", during my studies, 90 percent of the people rejected the 80:20 offer. Economic theory is destroyed by natural human characteristics such as own interest, pride, humiliation, revenge (underlined by P. B. – R. V.). According to the experiments you have to come up with a 65:35 at least ratio in order to have a relatively good probability of success."

From the perspective of what we are dealing with (deciphering the nature of human behavior via game theory in a specific modification of the theory of redistribution systems), it would be rather difficult to find a more suitable example that opens the way for the following:

- Disproves the above mentioned "generally popular error" that (stated, for example, in the words of the text's author) "economic theory is destroyed by natural human characteristics such as own interest, pride, humiliation, revenge", respectively shows that good economic theory is able to decipher the sources of this type of psychological phenomena.
- Illustrates that behind every discovered layer of reality is another and more interesting layer.

Before we show what is happening in the given case, let's take a look at the reactions of readers at the same web address (we selected those that deal with the matter the most). We label the readers with the letters A, B, C, etc.:

A: "Good exercise. I also wouldn't take the twenty: If you're a penny pincher, then you'll lose out as well. But the truth is that if I were on the other side of the experiment, not even for a second would I consider making an offer other than fifty-fifty. Does something arise from this? Probably yes. I am probably at the edge of the Gauss curve. Where is its middle? Around that thirty five?"

B: "I'd take the twenty, but I immediately thought of the same thing as Jedla: If I were on the other side, I'd share the found money 50:50. That's human. Maybe that's why I don't have anything to this day..."

C: "Well Mr. Michl, you're quite rough. If it is set up in the way that if the other person refuses then nobody gets anything, then I wouldn't risk so much."

D: "The second person got an opportunity from the first person, he'd have absolutely nothing without the first person, so from my perspective 50:50 isn't the only fair offer."

E: "Mr. Michl, you forgot about ideas such as fairness and fair play – I understand you, fair play is not an economic category."

F: "You really don't know that in a normal "men's society" (in the army, among scouts, in a group of construction workers) 50:50 sharing is the absolute standard and any other ratio qualifies as being a rat and a scoundrel? It is this fact that appears to be unknown to our "elites" that believe that they can steal at will, even in cases where 'they can be seen'. I read somewhere that ethical conduct is basically a reflex – those that steal publicly are acting against this reflex and will be, sooner or later (most frequently in a time of some crisis – lo and behold!) punished. "

G: "I had one more idea – what impact does the amount of the money have. It is quite simple to reject a small beer from the point of view of 'fairness'. But how would a person behave when dividing 1 million (20:80)?"

H: *"If I understand the conditions well and if they are also one hundred percent clear to the experiment participants (i.e., they are not under some pressure), then I think, Mr. Michl, that you are approaching the matter too scientifically. We simple people honor half and half or go to..., either accepts or rejects."*

I: *"What fifty-fifty? This is no sharing with a friend. It doesn't matter who played the more important role. It is a model situation and the only thing that is important is maximizing profit based on what I can do. I can make one offer. General statistics, Mr. Michl, are useless. What is decisive is what the amount of the second person's share means for him/her. If it represents his/her yearly income, then he/she will take it without regard for whether he/she is angry with you. If it will be twenty crowns (in the same ratio) he/she will send you to hell. So it is not possible to establish a general ratio. If this really concerned a hundred crowns, it's a waste of time trying to solve it."*

J: *"Nice psychological game: what amount will be enticing enough for your opponent so that he/she gives up the pleasure from the thought that you get nothing? It's possible that maliciousness can also play a role when considering sharing in the liquidation of a problem. Suicidal!"*

Note that practically all reactions refer to various psychological phenomena with which the readers attempt to justify their position regarding the given problem.

The example of the division of the 100 CZK is an example of what we call "positive investing". Let's imagine that the first game (of the division of the 100 CZK) is followed by another, i.e., game of the above described. Specific example – after the participants of the previous game divide the 100 crowns, they will compete for a girl. Each of them knows the following: The girl will choose the guy that will buy her the nicer (and in our case thus the more expensive) flower. Then exactly according to economic theory (of course under precisely defined conditions) the only acceptable division for each of the players is 50:50. Otherwise the person that gets the least in the first game will absolutely certainly lose in the second game.

One can object that our example is based on artificial assumptions (the girl chooses only based on who brings her the more expensive flower). But even the initial example was based on the creation of conditions that are not entirely natural. If this did not concern experimenting, then a magician would have to enter the game.

In reality a number of various games are played in parallel and these games mix in with one another in various ways. Nobody knows their parameters absolutely exactly and each player only guesses them. We meet with positional games, which we discussed, almost everywhere (how one dresses, which car does one drive to the government office, which lawyer does one hire, which restaurant does one visit, what kind of party one can afford to finance...). One performs the evaluation of the various games – how they mix with one another, how to play them and how to hold up in them – not only via rational calculations but also via his/her emotions. A person rates (but only very approximately and with a number of failures) real situations with his/her psyche (feeling). This also manifests itself by the fact that in a person's psyche we also meet with such phenomena as envy, resentfulness, etc. But this does not mean that in the area of the "deciphering" of reality we

cannot use a suitable economic model based on the assumption of the rational foundation of human behavior.

Inter alia – in order to decode (decipher) a specific simple case, we usually need to reveal about 4-5 layers. Sometimes we already have a "reading device" (model that is gradually being deciphered) available, and sometimes we do not. It is relatively exciting to decipher social reality including human weaknesses (if these really are weaknesses) in this way.

For illustration purposes let's introduce a third layer that would follow the two that we described above (games assuming a magician offering under certain conditions one hundred crowns and positional investing into a flower via which it is possible to win the desired girl). As we have already demonstrated, for a rationally thinking player there is only one reasonable solution (if the player is informed about the follow-up game that leads to winning the girl) and that is to offer a 50:50 division. If the player offered a share that would be more advantageous for him, the second player would have to reject this share with regard for the existence of the follow-up game. But this is not the end of the game. Both players have 50 CZK, which they can spend on a flower in order to try to win the girl. But they can also do something else. One who has learned to see real situations via game theory will immediately think of what they can do and what other game they will start by doing so.⁵ The players can conclude an agreement that they will not use the money to buy a flower and that they will use it in a different way. Because if both purchase a flower, neither player gains anything. Each of them can either comply with the agreement or breach it. This will get them into the situation that is described by one of the most famous game situations -- the so called Prisoner's dilemma.

Analysis of redistribution systems shows that what could appear as external influences in them (e.g., personal sympathy or antipathy, envy or hate, etc.) is frequently given by the system parameters themselves.

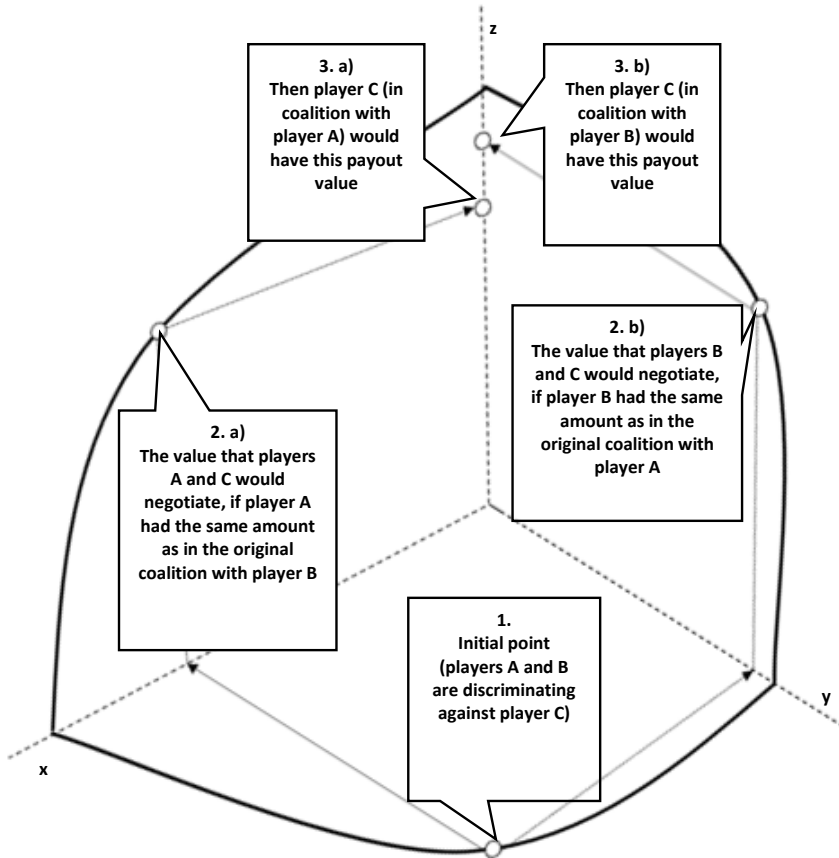
Graphical depiction of strategies leading to discriminatory balances

As an elementary (and as truly the simplest in the given case) strategy that is characterized by full symmetry from the perspective of the position of all entities can be considered the strategy in which the players focus on creating discriminating coalitions. In previous papers published in the ACTA VŠFS⁶ journal we demonstrated how any redistribution situation (any division of payouts in accordance with the redistribution equation) can change into a situation in which one of the players is fully discriminated against (i.e., has the lowest possible payout). As a follow up to this we will now demonstrate how negotiations take place inside coalitions if a transformation of one discriminating coalition into another is occurring:

5 J. Benesch (2008) in the motto to his diploma thesis quotes the following statement by D. McAdams from the Massachusetts Institute of Technology in connection with this: "Game theory is a structure of thinking and as soon as you become aware of it once you see it everywhere."

6 Budinský-Valenčík 2008a, Budinský-Valenčík 2008b, Budinský-Valenčík 2009a.

Illustration 1: One step of negotiations based on the creation of fully discriminating coalitions (initial situation – discriminated against is player C with payout z)⁷



Commentary to the illustration:

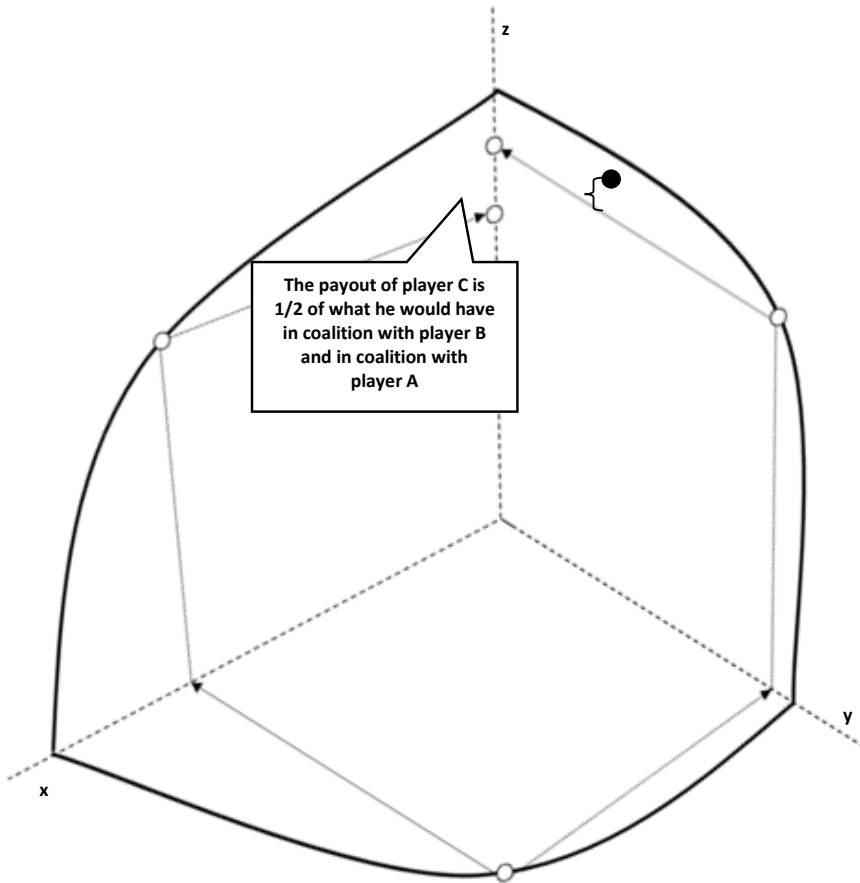
- Player C is discriminated against (minimum on the z axis), meaning that players A and B concluded a coalition.
- Player C knows what his maximum payout would be if he concluded a coalition with player B or A (this coalition is determined by the fact that he would have to offer the relevant player at least as much as this player had in the original coalition).
- Player C immediately knows that in the given case it is worthwhile for him to conclude a coalition with player B because it is in coalition with him that he receives the maximum payout.

Let's assume that each of the players that conclude a new coalition wishes to improve his situation. So player C must offer more to player B. He thus decreases his maximum payout by some amount so that he can offer a part of it to player B. Be he cannot decrease it too

⁷ Taken from P. Vávra's diploma thesis (2009).

much; for player C the coalition with player B must remain more advantageous than a coalition with A. Let's say that he decreases his profit, for example, by one half of the difference that he would gain. Instead of one half of the difference, any other percentage division of the difference between the two maximum payouts of the two players could be applied.

Illustration 2: Graphical depiction of one step of negotiations from the perspective of what determines the size of the payouts of player C⁸



⁸ Taken from P. Vávra's diploma thesis.

$$1 + y + z = 12 - \eta \cdot R(5; y - 4; z - 2)$$

$$x + 1 + z = 12 - \eta \cdot R(x - 6; 3; z - 2)$$

$$x + y + 1 = 12 - \eta \cdot R(x - 6; y - 4; 1)$$

These are three independent equations with three variables, the solutions of which are the values of discriminating balances that we are looking for. The discovery of the elementary strategy of negotiations shows and proves that even without solving a relatively complicated system of equations, but merely on the basis of negotiations – the logic of which is not too far removed from human behavior – the negotiated coalitions approach what we have named discriminatory balances.

Strategy making it possible to attain a balance acceptable for everyone

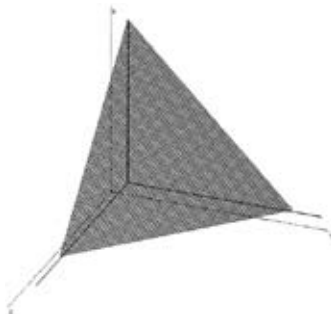
As we have already stated in the introduction, redistribution systems are a special case of N-coalition games. They differ from generally considered N-coalition games by the term $\eta \cdot R(x - a; y - b; z - c)$, where:

- Function R is the method for expressing the distance of payouts from the performance of players on the decline of the performance of the entire system.
- Coefficient η represents the degree of the influence of this distance on the decline in performance.
- Parameters a, b, c characterize the performance of the players.
- Variables x, y, z are the payouts of players.

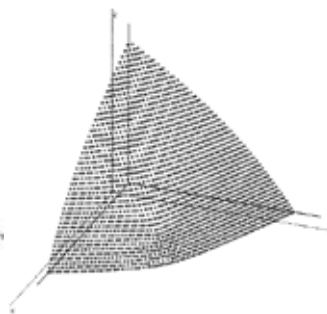
Whereas in the generally considered N-coalition games all maximum reachable payouts of players are in the sub-space with N-1 dimensions, which is not curved (the division of the payouts does not have an impact on the performance of the system as a whole), in our case this sub-space is curved. Let's demonstrate what this difference means in the case of three players, i.e., in a case that can be displayed via projection in a two-dimensional space and that can be imagined relatively easily:

Illustration 4: Graphical depiction of the difference between generally considered coalition games with three players and redistribution systems where the division of payouts has an impact on the performance of the entire system

Regular coalition game with three players

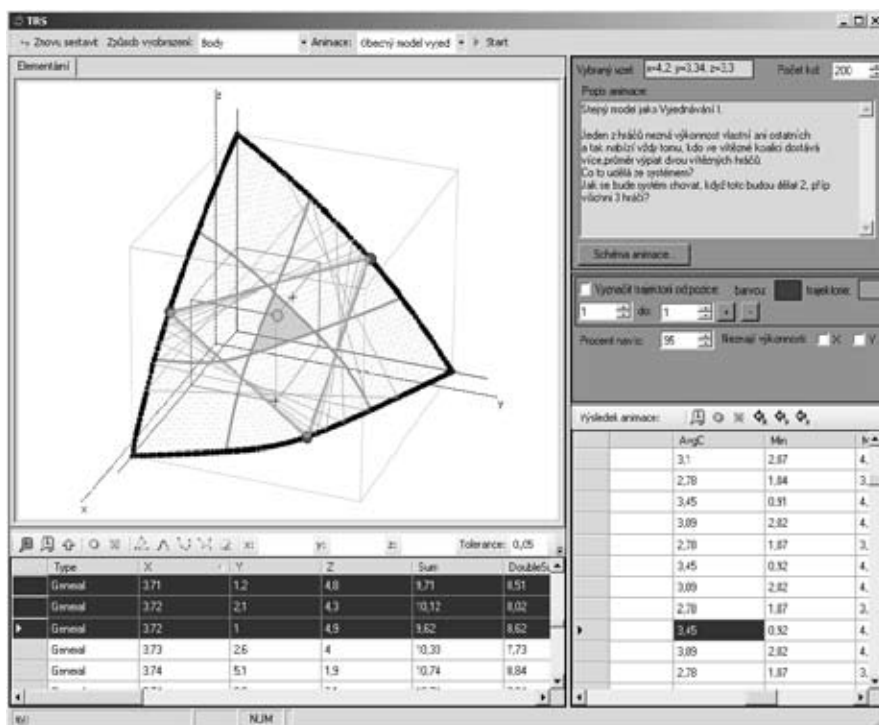


Redistribution game with three players



At first glance, the difference between generally considered N-coalition games and redistribution games is not significant. Until we ask the question: What payout can each player expect? If no external conditions affect the system, then each of the discriminatory balances has the same probability of occurring, i.e., probability of 1/3. If the system arrived all the way at the three stated discriminatory balances, then the average payout of each player would equal 1/3 of the sum of his two payouts in a discriminating coalition and the one smallest payout when out of the discriminating coalition. The set of points in which each of the players has this average payout has the form of a line on the redistribution space. Let's call these two lines the lines of average payouts in discriminatory balances. Using a computer model we will demonstrate what these lines look like.¹¹ The following illustration is an authentic depiction of how the user sees this model.

Illustration 5: Redistribution space with the designation of the line of average payouts and the space of Pareto improvements in comparison to average payouts



The thin lines show how the system converges towards oscillation between three unstable discriminatory balances. The thick lines are the lines of average payouts. The space inside the figure delimited by the lines of average payouts in discriminatory balances ("canopy" on the redistribution space) represents the Pareto improvements in comparison to the case of negotiations leading to the formation of discriminating coalitions. The fact that these are Pareto improvements is the result of a greater deviation from the division of payouts based on performance in the discriminatory balances than inside the space delimited

¹¹ Taken from P. Vávra's diploma thesis.

by the lines of average payouts in discriminatory balances. These Pareto improvements in comparison to the average payout of each of the players are possible due to the curvature of the redistribution space. I.e., they are possible only in a redistribution game and they are not possible in a regular N-coalition game.

Subsequently the following questions can be asked:

- Is there some precisely defined strategy of negotiations that when it is applied the game is “raised” from the creation of fully discriminating coalitions (in which one player always has the lowest possible payout) to the creation of coalitions where even the discriminated player receives a higher payout (and one that keeps growing in the process of negotiating), respectively when he stops being discriminated and the formation of a mutually acceptable balance occurs?
- When and how in this case does the negotiations process converge towards the mutually acceptable balance?
- Which player becomes aware of this possibility and when (will one of the players be first or will they all discover it at the same time)?
- What is the simplest strategy of negotiations that would make it possible to attain the Pareto improvements in comparison to the discriminatory balances, and how should it be defined?
- What are the assumptions of the process of convergence towards a mutually acceptable balance, i.e., the point given by the conduct of players based on rationally substantiated morality?
- Which of these assumptions is the most “sensitive” to external conditions, i.e., in reality what blocks or reverses the process of convergence towards a mutually acceptable balance the most or most frequently?

There is much more hidden behind these questions than would appear at first glance – this is because the matter concerns the transition from confrontation to cooperation of the participating players; there is a certain hope that the identification and description of the relevant strategy will reveal what is present in every transition from confrontation to the more reasonable resolution of problems, i.e., something like the foundation of rationally substantiated morality.

The questions asked above can be answered by answers, the correctness of which can be tested with mathematical means. Mathematics plays a dual role here. First, math makes it possible to create a computer model that clearly shows what is taking place with various initial parameters in the redistributions system. And it also makes it possible to test (via mathematical proof) whether the discovered strategy leads to the attainment of mutually acceptable balance. The discovery of a relevant strategy leading to the attainment of mutually acceptable balance thus becomes a matter of intuition.

Each player, from a certain step in the process of negotiations in a winning coalition, always has a better position one time and a worse position another time. This is apparent from the computer depiction and it can also be inferred logically. A better position (his payout is greater than in the second case and is greater than in the case of the attainment of discriminatory balance), when he enters the coalition from an already winning coalition, and worse when he enters the winning coalition from a discriminating position. In

addition to this we see that during the negotiations the payouts of all players (“from the bottom” as well as “from the top”, i.e., their better as well as their worse payouts) gradually approach the discriminatory balance.

Let’s now take a look at the given situation through the eyes of one of the players (e.g., player C). After each negotiation step this player C:

- Calculates the better average of player A (that is 2x his better payout in the winning coalition + 1, all of this divided by three).
- Calculates the better average of player B (that is 2x his better payout in the winning coalition + 1, all of this divided by three).
- He inputs these better averages values into the redistribution equation and determines how much he would get if players A and B receive a payout in the size of the given (i.e., attained after the given step) better average.
- He compares the result with his own better average.

What does he determine? If at the beginning the payouts will be farther away from the discriminatory balance, then the better average of his payouts will be greater than the outcome of the solution of the redistribution equation after the inputting of the better averages of players A and B. Gradually, with each round of negotiations, as the values of the better payouts of all players will approach the value of the discriminatory balances, thus decreasing the average better averages, the values of the better average of player C and of the result of the solution of the redistribution equation after the inputting of the better averages of players A and B will get closer and closer. We can take any small number and the values will be lower than this number.

We can interpret this small number as the player’s sensitivity. If the deviation of his payout following from what he will receive based on the redistribution equation, from what he gets as the average of two of his better payouts and one smaller (i.e., equal to 1) is smaller than this number, he will be satisfied and will not initiate further negotiations. (The deviation will be “below his discriminating level”.)

Player C can then offer these better averages as the payout and both players, just like him, will (Pareto) improve their position in comparison to their own average payouts calculated on the basis of discriminatory balances. If the sensitivity of all players is equal, all three players will see this situation at the same time from their point of view. If the sensitivity of the players is different, the negotiations will only end when the most sensitive player is satisfied.

If the sensitivity of the players approaches zero, the negotiations in the system based on the above mentioned rules will converge towards a certain point. Let’s call this point the mutually acceptable balance. We see that the mutually acceptable balance is clearly determined. From a mathematical perspective, the point of mutually acceptable balance has several very interesting characteristics, which are currently being investigated.

If we become aware of the sense of the strategy leading towards a mutually acceptable balance, we discover that it is also natural and performable via an estimate (i.e., the players can be guided by estimates; they do not have to perform complicated calculations).

Interpretation of the mutually acceptable balance

The result that we have attained is quite significant. It is said that under relatively general conditions, there is a natural – acceptable to natural understanding – strategy, which makes it possible for players in redistribution type systems to not try to negotiate discriminatory balances but to give priority to a mutually acceptable balance. This has been clearly determined and shows a number of interesting characteristics. To put it in other words - not only is it worthwhile for players to proceed in agreement, but there is also a clear path for attaining this agreement as well as a clear outcome of this agreement. The result can also be interpreted (as we have already mentioned) in the way that there is a rational foundation of moral conduct in these systems.

Those who are skeptical against the possibility of expressing important moments of real human behavior via mathematical models based on the assumption of human rationality will object: What is this result good for if in reality a real person will succumb to the temptation to discriminate against another, act irrationally, let his/her bad characteristics show? What is an abstract model good for if reality is different?

Here it is worthwhile to remind of the example that we discussed right in the first chapter and that was related to seemingly “irrational” elements in the conduct of people in experiments with the division of a certain amount of money. Finding what can be called the objective foundation of rationally substantiated morality in redistribution systems can become the key to revealing what is preventing the attainment of a mutually acceptable balance, i.e., the key to revealing (said with a bit of simplifying and exaggeration) what the source of human badness is.

We know that the attainment of a mutually acceptable balance is possible only under certain conditions. Most of the time they are related to the “cleanliness of the model” (no external influences, redistribution has clear rules, negotiations have no transaction costs, everyone is perfectly informed about everything, etc.). In other words - any disturbance of the assumptions (any “contamination”) can make it impossible for a system to converge towards a mutually acceptable balance. Which of these disturbances are most significant? (By asking this question we attempt to reveal the next “layer” of reality via the model.)

We first think¹² that it is a natural human characteristic to evaluate ourselves differently than others. We have the tendency to over-value our own abilities (performance) and under-value the abilities (performance) of others.¹³ But a detailed analysis of this case

12 This was also the case at the *Economy of productive consumption and social investing theoretical seminar*, which is organized regularly every week at VŠFS during teaching months since October 2003, see <http://www.vfsfs.cz/?id=1046>. At this website it is possible to follow the work of the team dealing with the theory of redistribution systems and the latest results.

13 At the above mentioned theoretical seminar was also discussed the possibility that the above stated is connected with the leadership syndrome. See the seminar on the topic: *New ideas in the theory of redistribution systems III (Can the “leadership” syndrome be calculated?)*, which took place on June 10, 2009. Documents related to the seminar are available at <http://www.vfsfs.cz/?id=1046>.

shows that the limited ability of individual players to assess their own performance and the performance of the other players is not the factor that plays such a significant role. This is because the following holds true:

- Each player is able to adjust his evaluations based on what proposals are being given during the negotiations process by the other player.
- The player who would not perform such adjustments (was insensitive to what is being stated in the proposals for the division of payouts) would find himself “out of the game” (the coalition would be formed by the players that are able to mutually adjust their evaluations).
- Therefore the strategies of the mutual adjusting of the assessment of performance win and these strategies also converge towards the mutually acceptable balance.

(Of course also here it holds that the assumptions of the mutual adjusting of the assessment of performance can be disrupted in various ways based on proposals that are submitted during the negotiations, but this would be subject to another, “finer”, analysis.)

Therefore what remains is the question what from the perspective of the disturbing of the process of negotiating a mutually acceptable balance is the main, most important and thus also the key factor. Key in the sense of revealing what in reality restricts the use of rationality regarding the selection of moral conduct in the given area (for the relevant type of redistribution games). We will focus on this in the next part.

Parallel redistribution games

What plays the decisive role in the thwarting or blocking of the process of the negotiating of a mutually acceptable balance can be revealed via the following consideration (we state its most important points):

- Among other things, a condition of the convergence of negotiating towards a mutually acceptable balance is knowledge of one’s own performance, performance of the other players and impact of the deviation of the payout of individual players from their performance on the performance of the entire system. (These are relatively strong conditions, which tend to not be met in reality.)
- The players estimate their own performance, the performance of other players as well as of the impact of the deviation of the payout of other players from their performance on the decline of the performance of the entire system with a greater or lesser degree of inaccuracy, but they can react to what valuations they give and adjust their assessments according to that.
- A player who would not react to the difference of his own assessments and the differences of other players would lose his negotiations position, i.e., each player must react in a certain way to the fact that his evaluation differs from the evaluation by other players.¹⁴

¹⁴ One of the important results of the theory is that if he isn’t doing it, it’s not “for no reason”, but we must search for the causes elsewhere. Where? That follows from the following text.

- It is suitable to view the performance of players as a multifaceted phenomenon, where the players complement one another in some parameters of performance (resp. competences).
- The different scenarios can occur in the systems. Either the players value and appreciate the "difference" of other players, i.e., that another player can do something that the original player cannot do himself. In this case it appears (which at this moment we are expressing only as a hypothesis) that the adjustments of mutual assessments converge towards the mutually acceptable balance. In reality this case will manifest itself as the effective functioning of the team. Or the evaluation of players, where some performance parameters are over-valued and some are under-valued, will win. The winning coalition will be formed by the players that prioritize the assessment of those parameters of performance, respectively of those competences, in which they have the advantage and that discriminate against the other players. From the original prioritizing of own competencies ahead of the complementary ones, the players very quickly transition to the state where the leadership parameter and the ability to subordinate to the leader against all other competencies, is valued. The performance of the system goes down very quickly.
- The next phase of the development of the system in this direction is the formation of parallel redistribution other than the one that is connected with the original source of income that the players are dividing among themselves. (Mostly this concerns phenomena that are evaluated negatively – taking bribes, work in favor of the other party, application of a double standard policy towards the external environment, etc.)

We see that there is relatively a lot of what must be taken into consideration, if we are to say what influences the behavior of players in some specific redistribution system (from the perspective of the attainment of a mutually acceptable balance). If we want to reveal the general laws of behavior, we must find what the main cause preventing the attainment of a mutually acceptable balance is. In the given case we must search for what in reality will win as the dominant influence that overrides all others. The solution is thus based on the comparison of various specific influences and their evaluation from the perspective of which one predominates. From this perspective we can say the following:

- What influences the deviation in the evaluation of own and others' abilities as a condition for the assessment of performance is outweighed by what abilities (competencies) are accepted as beneficial for the overall performance of the redistribution system. I.e., what is decisive is not how good someone is, but what someone is good in. Discrimination is then based on the fact that the significance of some abilities, respectively competencies, is not appreciated, not considered as beneficial from the perspective of the performance of the entire system.
- Which abilities, respectively competencies, are appreciated in the system is outweighed in the case of parallel redistribution games by the fact that a certain such game is being played. Which coalitions will be formed in a given system and how payouts will be divided, as far as the original redistribution game is concerned, is then decided by which parallel game is being played (or which parallel games are being played).

- If multiple parallel games are being played in a certain system, the role of those that in a certain way interconnect the given system with other systems will predominate.¹⁵

Some practical aspects of the identification of parallel redistribution games

From the perspective of managerial practice, a number of recommendations follow from the above stated (i.e., the general statements made above can be translated into the language of practice):

- For the stability and performance of a system, it is exceptionally important to support complementarity in mutual assessments (including informal) of player performance. I.e., a good manager will always emphasize and value the specific contribution of each subordinate; by doing so the manager will also contribute to the awareness that it is important to see who is beneficial how for a given system (worksite or company).
- Further to the above stated it is important to identify the entire spectrum of abilities, respectively competencies, via which the players can contribute to the improvement of the entire system's performance. I.e., a good manager is able to recognize everything that is beneficial for the performance of the entire system (company or worksite) in the form of specific abilities of specific people.
- Based on that the performance of the system is increased on the one hand, and on the other hand conditions are created that make it possible to recognize the seeds of parallel redistribution games early. I.e., a good manager must be aware of the risk of parallel redistribution games, able to identify their potential sources or current manifestations and subsequently then prevent them from establishing in the given system (in the company or at the worksite) as that, which determines the formation of coalitions and divisions of various types of gains.
- In order to be able to do this, it is necessary to evaluate the environment in which the given system is found and from which the penetration of various influences can be expected. I.e., a good manager must be aware that the given system (company or worksite) is not isolated from its environment, of what types of redistribution games have been established or can become established in various redistribution systems (institutions, organizations, companies, etc.) in the manager's surroundings and through which paths their influence can penetrate, and then face these influences based on these facts.

We are currently mapping the mentioned area from the perspective of differentiating basic types of various parallel games according to the following, among other things:

- Whether they expect or do not expect the interconnection of the given redistribution system with other systems.
- Whether the payouts to some players are greater than in the basic redistribution game or not.

¹⁵ Here the theoretical connection with the role of social networks established from cross-coalitions (i.e., coalitions among redistribution systems) and subsequently also with the role of replicators in the process of communications (so called memes and memplexes) can appear. See Budinský-Valenčík (2009 b).

- Whether they have a direct impact on the original redistribution game, i.e., lead to a different division of payouts inside the original redistribution game or change also the parameters of the redistribution equation of the original redistribution game.
- Whether they expect or do not expect various levels of player informedness.
- Whether players are paid from the means of the original redistribution game, from the means of the parallel game, or in a combined way (and which players these are).
- Whether they are or are not games within the hierarchic structure of redistribution systems.
- Whether they have or do not have an impact on the decline of performance in the hierarchic system.

In these parallel games we can then watch the following parameters:

- Payout size of the players of the parallel game.
- Impact of the parallel game on the performance decline of the original game.
- Role of players that are or are not informed about the existence of the parallel game and its parameters.
- How players are paid within the original redistribution game or from the means of the parallel redistribution game.
- How the impact power of players changes based on whether and to what extent they are informed about the parallel games.

The lists above are not complete. Each suggestion for adding to the list is welcomed. It is apparent that each step in the mapping of parallel games is beneficial in the putting together of the mathematical, respectively computer model, and also has immediate significance for the better understanding of what takes place in practice, makes it possible to define and name various standard situations that we can come across. It is also worth mentioning, respectively alerting, that the significance of parallel games is considerable and probably also growing, yet we usually do not come across analyses of this problem in the theoretical literature. This can probably be explained by the fact that in order for us to become aware of (reveal, appreciate, or even directly see) the significance of the corresponding phenomena, it is necessary to use a theoretical model.

If we reach the conclusion that what decides the formation of coalitions and division of payouts in redistribution systems has the form of parallel redistribution games, then this is logically followed by the question of which of the parallel games are the most important, respectively most determining, from this perspective. The simplest answer to this question is the statement that it is those parallel games that win as the determining ones that are the determining ones.

By making such a statement we only establish several types of tasks, including especially the following:

- Naming, describing and classifying parallel redistribution games, respectively putting together a well structured full list.
- Capturing of how individual parallel redistribution game types are connected with each other.

- Identifying the manifestations of parallel redistribution games in various redistribution systems.
- Revealing of the dynamics and developmental tendencies of redistribution systems from the perspective of the role of parallel redistribution games in them.
- Searching for the answer to the question of what to do, i.e., inferring practical conclusions.

The following parallel redistribution games can be played in redistribution systems:

1. Games based on the use, respectively abuse, of one's position in a relevant redistribution system. This means transacting with something that is administratively restricted, i.e., so called 'capturing income'. This can have the form of:

- Corruption or the taking of bribes.
- Abuse of authority.
- Use of double standards in the levying of sanctions or provision of advantages, etc.

2. Games based on the pushing through of a certain lobby into the leadership position in the system. This can have the form of:

- Efforts to push oneself through into the leadership or advantaged position.
- Pushing into a leadership or advantaged position someone from whom one expects the provision of certain advantages.
- Acting as an intermediary ("reconciliator" or "buffer") between enemy sides with the goal of pushing through one's own acceptable solution and the advantages that follow from it.
- Role of a hidden player acting in favor of the second party (externally the player acts as the one who supports a certain lobby, but in reality he is interested in pushing through a different lobby – one that is competitive or unfriendly towards the original lobby – and attaining the advantages based on this).

3. Games in favor of a lobby that is outside of a given redistribution system, which can:

- Be hierarchically superior to the given redistribution system.
- Be hierarchically subordinated to the given redistribution system.
- Function in parallel with the given redistribution system.
- Have the form of a cross-coalition between redistribution networks, or of a network between redistribution systems formed out of the corresponding cross-coalition.

Parallel redistribution games can differ by the following parameters:

1. Number of players, where:

- The game is being played in the given redistribution system by one player without a partner; the second player is the system itself in which the player is playing the game.

- The game is being played in the given redistribution system by two players who can maintain a partnership between them or breach it based on the payouts given by the parameters of the environment.
- The game is being played in the given redistribution system by three or more players, out of which each of them can maintain partnership between him and the players of a given parallel redistribution game or breach it based on the payouts given by the parameters of the environment; at the same time, however, the formation of coalitions is taking place inside the given parallel redistribution system.

2. Informedness of players, where:

- All players can be fully informed about all games, including parallel games.
- Some players are fully informed and some are not fully informed (only know the parameters of the original redistribution game).
- There are fully informed, not fully informed and fully uninformed players in the system.
- None of the players are fully informed about all of the parallel games that are being played in the system.

3. Nature of the environment in which they operate:

- The environment can be competitive, where a given redistribution system must attain or maintain a certain performance level in order to hold up in the given environment.
- The environment can have the form of the inclusion of a given redistribution system into a hierarchic system.
- The environment can have the form of a predominating influence of cross-coalitions and the social networks that become established out of them.

It is necessary to differentiate the following in every redistribution system in which parallel redistribution games are being played:

- Payouts of players in the original redistribution game.
- Payouts of players in other parallel games that they are playing.

The corresponding payouts can have a monetary or non-monetary form (e.g., positional, information, benefits, attainment of trust, etc.); mechanisms for the transfer of monetary payouts into non-monetary payouts and vice versa also exist.

Relations between parallel redistribution games are as follows:

1. Competitive, respectively mutually competing and mutually crowding out parallel redistribution games (mainly for who will dominate the original redistribution system) – A typical example of such a parallel game is the pushing through of mutually competing groups inside a certain redistribution system.
2. Inserted parallel redistribution games – Another game is inserted into a certain redistribution game.
3. Subordinate parallel redistribution games – For example, the tolerating of small parallel redistribution games in return for support by those playing them, in larger and

more hidden parallel redistribution games (e.g., when subordinating a given redistribution system to external influences).

4. Complementary parallel games – Games where one type of parallel game necessarily assumes the existence of another parallel redistribution game.

There are certain general tendencies of the direction of the development of redistribution systems with parallel redistribution games:

1. The subordination of games based on the abuse of position to games based on the pushing through of a lobby, subsequently then the subordination of games based on the pushing through of a lobby to games connected with the formation of cross-coalitions among various redistribution systems and related social networks.
2. The crowding-out of the competitive nature of the environment in which the redistribution systems operate with the growth of the role of cross-coalitions between redistribution systems and the social networks that form out of them.
3. The penetration of determining parallel redistribution games in a given redistribution system by inserted parallel games and the formation of cross-coalitions among various redistribution systems by players that are informed about these inserted parallel games.

Every player in every parallel game has the possibility of either playing this game or exiting it, respectively exiting the given parallel game. The player can exit in two ways:

2. Either by playing only the original redistribution game in the given redistribution system.
3. Or switch to a competing (unfriendly) parallel redistribution game.

Both types of exit mean a loss for the player as well as for those players that know the parallel game that the player exited. The player's willingness to exit is given by the size of the payout that he receives in the parallel redistribution game and by the size of the payout that he can get by exiting the parallel game. Therefore:

- Payouts in parallel redistribution games are usually very high for the participating as well as informed players.
- Any exits of players from parallel games are accompanied by negative payouts, i.e., sanctions.

At any rate it holds that payouts of informed players playing determining parallel games are closer to the mutually acceptable balance than the payouts of players in the original redistribution game. The main sense of discrimination against some players in the original parallel game and the preferential treatment of other player serves mainly for making uninformed players enter the parallel game. These are players whose vote or influence in the resolution of questions inside the original game is significant, who have some advantage from the provision of the vote or influence, but who are usually not informed about what parallel games are being played. That is why their reward can only come from the original redistribution game.

What conclusions can be expected from research conducted in this direction? From the perspective of practical research, this concerns, among other things, the answer to the following questions:

- What basic types of parallel redistribution games can be played and what are their characteristics that make it possible to recognize them in the given system.
- How to take advantage of the revealing of those parallel redistribution games that are being played in the system for the elimination of their influence (for example, what role in this is being played by the increasing of the informedness of those players that are not informed about the games; what type of coalitions can eliminate parallel redistribution games that decrease the performance of the system, etc.).
- Etc. (In a more practical position one can then expect the identification of characteristics of what makes it possible to relatively accurately differentiate, for example, truthful statements from badmouthing, etc.)

Instead of a conclusion

We consider the creation of a mathematical model of parallel redistribution games as the primary and, from a practical perspective, a very beneficial task of further research. This model will probably be the expansion of the elementary redistribution system model. As is being suggested also by the experience up until now from the development of the redistribution systems theory, it should be a model that is elegant and that would make it possible to look at the results that have been attained up until now from a certain detached point of view. The patient identifying, mapping and classifying of parallel games can contribute to the creation of this model. The practical sense is also apparent – the better the overview of the various types of parallel redistribution games that we will have, the greater is our chance to not allow their impact on the decreasing of the effectiveness of these organizations, institutions, companies, etc., in which we work or for the operations of which we are responsible. And that's what it's all about.

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