ELEMENTARY MODEL OF INSTITUTIONAL CHANGE AND ECONOMIC WELFARE

ЭЛЕМЕНТАРНАЯ МОДЕЛЬ ИНСТИТУЦИОНАЛЬНЫХ ИЗМЕНЕНИЙ И ЭКОНОМИКА БЛАГОСОСТОЯНИЯ

ELEMENTARNI MODEL INSTITUCIONALNIH PROMJENA I EKONOMIJA BLAGOSTANJA

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Summary: *The article discussed problems of influence to institutional change, rate its change, for economic systems, wealthy and efficiency. Author are offered and in detail developed the model of institutional change, and discovering the effect of chess-game, to demonstrate, that the speed (rate) and matter of institutional change determination by performance of economic systems to shot time period. This is give possibility do some conclusions to economic policy and the theory of efficiency, which are not coincide to conclusions of mainstream.*
Key Words: *institutes, institutional change, effect of chess-game potential of institutional change, market to level of prosperity, efficiency.*

Аннотация *: В статье рассматриваются проблемы влияния институциональных изменений, скорости этих изменений на экономическую систему, благосостояние и эффективность. Автор предлагает и подробно развивает модель институциональных изменений, и, обнаружив эффект „шахматной игры", демонстрирует, что скорость и содержание изменений детерминируют функционирование экономической системы в краткосрочном периоде. Это позволяет сделать выводы для экономической политики и теории эффективности, которые не совпадают с выводами „мэйнстрима".*
Ключевые слова *: институты, институциональные изменения, эффект „шахматной игры", потенциал институциональных изменений, оценка уровня благосостояния, эффективность.*

Apstrakt *: U članku se razmatraju problemi uticaja institucionalnih promjena i njihove brzine na ekonomski sistem. Autor predlaže i detaljno razvija model institucionalnih promjena i, primjećujući efekat „šahovske igre", demonstrira da brzina i sadržaj promjena determinišu funkcionisanje ekonomskog sistema u kratkoročnom periodu. To dozvoljava da se izvedu zaključci za ekonomsku politiku i teoriju efikasnosti, koji se ne poklapaju sa zaključcima ekonomije blagostanja.*
Ključne riječi *: instituti, institucionalne promjene, efekat „šahovske igre", potencijal institucionalnih promjena, ocjena nivoa blagostanja, efikasnost.*

JEL Clasifikation : *D 02; E 11; O 17; P 37;*
Original scientific paper; Recived: Avgust 02, 2011

High speed of institutional changes and the appearance of mixed depression, that is transformational, situational and provoked by the financial market collapse, require nontrivial approach to the macroeconomic policy designing, which takes into account mechanisms and effects of new institutes introduction and agents' reaction, including the institutional modification reaction.

The following questions are extremely important. Will the introduction of the new institutes or institutes transformation as a depression provoker provide the future growth in depression? Won't institutes introduction in the period of growth brake this growth?

Institutes can not only structure the exchanges, reduce transaction costs, but increase them, and raise the costs of property rights specification. In other words, such phenomena as institutes' dysfunction, institutional "mess" that provokes high degree of system's disorganization and low controllability level are possible.

For social development it is necessary not only to increase the satisfaction degree of the basic needs of all society members, but to reduce the difference reduction between the rich and the poor when the load and costs of ecological systems are not growing, and human generation is replaced by the one with better intellectual and creative abilities and higher productivity.

The neoclassics ignoring the influence of institutes in the short-term and medium time period did not consider the effect of "institutional effect smearing" on a time scale. However, this problem is not solved in the frameworks of institutional school either. Moreover, the speed problem of operated institutional changes becomes determinating in modern economy.

In my opinion, the solution of any problem, whether by means of institutional economic theory or neoclassical one, assumes a certain consistent action logic:

1) it is necessary to reveal, establish regularity, ratio or factors influence on the objective function;

2) well-grounded confirmation of such dependence, regularity, and ratio is required for it not to cause doubts;

3) it is necessary to understand, how tools of a state policy influence the change of this regularity and interrelation; what tools and in what degree; whether it is possible and necessary to change it and to what values; whether it will result in negative (worsening) change of other interrelations, regularities and behaviour models of the agents.

If the short period is considered $[t^1, t^2]$ and if we assume the speed of institutional changes as zero $\frac{\partial I}{\partial t} = 0$, that means full stability of institutional structures and transformations and mutations absence, the neglect of institutional changes which can happen during the periods $[t^1\text{-}1, t^2\text{-}1]$, $[t^1\text{-}2, t^2\text{-}2]$, $[t^1\text{-}3, t^2\text{-}3]$... $[t^1 - n, t^2 - n]$ affecting the economy in the interval $[t^1, t^2]$, is obvious. Having found no analytical methods to consider historical development in its models, orthodoxy developed economic policy mechanisms, and not having coped with them, it recognized them as a norm and made maximum efforts to substantiate objective motives of their existence. At each interval various mechanisms of economic policy were used, that is, it was necessary to estimate a new reality and to modify the transfer mechanism. Hence, the fact of such behaviour of neoclassical schools representatives denotes some mythical image of institutes' stability in the short period. Yes, some tastes and habits can remain permanent, but it does not say much for institutional changes I general potential stability. Let us suppose that $\frac{\partial I}{\partial t} \neq 0$ then it is necessary to accept two probable variants: 1. changes velocity on the interval $[t^1, t^2]$ is constant, that is, changes occur under the linear law (this variant is least probable) and 2. the speed changes according to some dependence, that is, changes occur under the nonlinear law and it is the most probable. Mathematically it looks like that: 1) $\frac{\partial I}{\partial t} = L$; 2) $\frac{\partial I}{\partial t} = n(t)$. Besides, there is a critical speed threshold of institutional changes and when economic system achieves it, it cannot develop normally. During this period practically any institute – new or old one, - does not function in full force, that is, in line with the initial purposes. Institutional quality of economic system decreases sharply. One more important condition confirming wrongness of the assumption about institutes' stability in a short run is the phenomenon of information accumulation from one period to another, caused by new knowledge, experience, skills and ways on each interval.

Certainly, if a chosen short time interval is some hours long, there will be no increment of information. However, such interval is of no value in the analysis of economic systems development. Usually under a short interval a year is meant, but during this period informational transformations becomes notable and cannot be but considered. In turn, information is inseparable from the concept "institute" and is an institute itself. It has all characteristics of an institute: information lives its own life, runs through all society institutional subsystems, being an analogue of nervous impulses in a

human body just as money is an analogue of human blood.

There appear some important problems here. Firstly, institutional changes potential on the interval $[t^1, t^2]$ will be defined as:

$$I = \int_{t^1}^{t^2} Ldt \qquad \text{или} \qquad I = \int_{t^1}^{t^2} n(t)dt,$$

that creates the necessity of constant L and functions n (t)defining which sets the speed of institutional changes on the chosen time interval. Secondly, from what interval apart from the considered one institutional influence is believed to be negligible. Thirdly, what period of time corresponds to each interval. Incidentally, time arrow in our case has even distribution, that is, all the time intervals are identical and equal, for example, to a year. But what will happen if they cover three years. Then the integrand function should be different. In the course of time ageing of various objects and processes is observed and there is a saturation. Social relations are not an exception. The same refers to institutes.

Thus, on rather long time intervals their behaviour can be modelled, using logistical regularities. Whether the information can be logistically modelled or not is still the question. To prove the presence of information saturation effects is possible, but its occurrence and modification are mainly random, and cannot be described by a gradual logistic curve, though in the interval boundary covered by a technological way, such regularities connected with information potential change are quite stipulated. Economic crises are usually inspired by various combinations of factors, such as, for example, the replacement of the prevailing technological way, errors of national economic policy, and the world's state of affairs change. A delay of growth rates, inflation acceleration, unemployment growth and population's real incomes decrease are thus observed, however, as for the information in the broad sense, there are no losses. On the contrary, there is its organization, streamlining, new data accumulation, including the information about the crisis, which allows preparing the base for economic growth.

So, it is necessary to conclude, that a premise proclaiming relative stability or institutes' nonchangeability on short intervals is a theoretical dodge intended for simplification of the analysis, but it does not correspond to the real state of affairs, though in a number of models it is quite legitimate to assume that the institutes are stable, but in other circumstances and models it is necessary to reject such assumption openly.

We will demonstrate the model of institutional changes on the example of chess game in which a grand master and a "second-rated athlete" take part. Other things being equal, when the rules of the game are clear and known to both players, the probability of the grand master's victory is very high, as he possesses the better level of attainment, knowledge of the chess theory and wider experience. In other words, if we use economic vocabulary, the intellectual capital of the grand master is considerably higher than the second-rated athlete's. However, if in the course of the game there will be a change of game rules the probability of the grand master's victory, as the general result of the game, will be steadily reducing and will depend on the rules themselves and the frequency of rules change. Eventually, the variant when this probability is equal to zero is possible, that is, the grand master will not gain the victory (drawn game), or will lose the game to the player with lower intellectual capital, practice and knowledge of chess game.

Thus, at high frequency of rules change the grand master can lose the game to "the second rate". Hence, knowledge, practice, and intellectual capital lose their value as a factor of production and competitive rivalry and depreciate at high rate of institutional changes, as well as with the absence of reasoning and logic inconsistence (when there is no expediency and logic or target adequacy). The result is the competitive winning of the weakest agent which seems to have to obviously lose at such provision with the factor. The present effect is coordinated with the effect of hyper-selection known in the evolutionary economy, but is just provided by the institutional changes characteristics. That is why, it is possible to assert, that high speed of changes in economy - reorganization, modernizations, application of new rules, regulations and laws are directly the anti-innovative factor of its development as it creates the condition of the unpredictable winning for the agent who was not able and should not have won the game under condition of rules system available at the initial point of time.

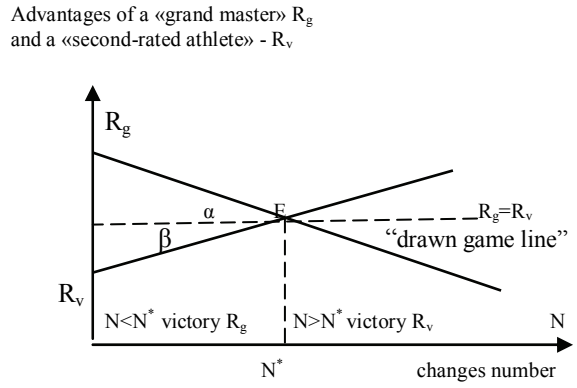

Figure 1. *Model of chess game effect*

In Figure 1 the model-scheme of chess game effect is presented. Certainly, economists should be interested in the case when with the game rules change "second-rated athlete" wins as the winning of the grand master is quite predicted for the obvious advantage according to intellectual capital (the level of health of players is accepted as equal, which is an obvious model simplification, by the way). Hence, it is necessary to consider the rules change bringing advantages increase for "second-rated athlete", that is R_v. Generally, it does not mean at all, that as a result of such changes the advantages of the grand master should necessarily be reduced, that is, that curve R_g is not necessarily falling. It can be parallel to X-axis, or have a positive slope and crosses the X-axis in point N^* considerably more to the right. It will only expand the advantages zone of the grand master. X-axis corresponds to the changes number of game rules. Of course, there are two serious assumptions in the model: 1) the content of changes and its qualitative main body is not estimated (it is characteristic of the similar models of supply and demand); 2) there is a dependence between the number of changes at a time unit (frequency of changes) and the advantages of "grand master" and "second-rated athlete" which is accordingly reflected by curves R_g and R_v. We will consider, that rules changes allow the advantages growth for the "second-rated athlete". Otherwise his victory is blocked by the advantages of the grand master which cannot be overcome. At such assumptions it is necessary to specify, that one-time change of rule subject to the quality and content of this change can at once lead to "grand master's" defeat, or some similar discrete changes can cause the same result. In such case the situation will not be described by the designated curves.

When the number of game rules changes is insignificant, as it is seen from the Figure, the grand master's advantage is obvious and ends with a victory more to the left of point N *, if more to the right of this point, then the "second-rated athlete" wins, and in point N^* there is "drawn game" as the advantages are equal $R_g = R_v$. We will understand the number of game rules changes, carried out during the period from the beginning of the game up to its termination owing to the victory of one of the players or an objective drawn game, as the change frequency. Then, on the basis of the Figure and introduced signs, it is possible to write down:

$$\frac{\partial R_g}{\partial t} = \frac{\partial R_v}{\partial t} + (tg\alpha + tg\beta)\frac{\partial (N^* - N)}{\partial t}$$

In consideration of N^* = const, $\alpha \neq$ f (t) $\beta \neq$ f (t)

$$\frac{\partial R_g}{\partial t} = \frac{\partial R_v}{\partial t} - (tg\alpha + tg\beta)\frac{\partial N}{\partial t} = \frac{\partial R_v}{\partial t} - n(tg\alpha + tg\beta)$$

whence $$n = \frac{1}{tg\alpha + tg\beta}[\frac{\partial R_v}{\partial t} - \frac{\partial R_g}{\partial t}]$$

If R_g =0, then $\frac{\partial R_v}{\partial t} = (tg\alpha + tg\beta)n$, that is, the advantage change of "second-rated athlete" is proportional to the change frequency of game rules where proportionality coefficient (k) is the advantages response of the "grand master" and the "second-rated athlete" to the change frequency of game rules: $\frac{\partial R_v}{\partial t} = kn, k = (tg\alpha + tg\beta)$.

As we see, institutional changes are defined by:

- Quality (content)
- Velocity (frequency)
- Adaptability potential of agents and institutes

Institutional changes velocity on intervals [t1 t2], [t2 t3], … [ti tn] can be its own, as well as the quality of these changes. In this connection the selection of functions Rg = f (N) and Rv = f (N), characterizing the change (distribution) of agents' benefits at institutional changes presents certain difficulty. These functions will vary not only subject to the speed and quality of institutional changes, and adaptive reactions of agents, but also subject to time. On each interval there can be its own dependence. To establish this function and to get $\frac{\partial R_g}{\partial t} = \frac{\partial f(N)}{\partial t}\frac{\partial N}{\partial t} = kn, n = \frac{\partial N}{\partial t}; k = \frac{\partial f(N)}{\partial t}$, all the time of institutional changes should pass as before this time has not finished yet, we may speak about the results of these changes only conventionally and hypotheti-

cally. This is the basic complexity of studying institutional changes.

Institutes can be neutral in their influence on certain parametres of economic system under consideration. Then institutional neutrality can be identified as the situation, when institutes do not influence system's macroeconomic parametres (or this influence is negligible): aggregate demand, supply, savings, investments and employment. The institutes which are not covered by this situation influence the specified parametres change the structure of the created income distribution between components of its use. At "chess board" effect institutional neutrality is in the fact that at rules change the benefits of the grand master and the "second-rated athlete" do not change, so the grand master will win.

If we introduce the potential of institutional changes I (t) as the ability of the system to carry out a number of changes in a time unit, we will assume in the model that the change of the potential corresponds (is equivalent) to the velocity of institutional changes.

Then $\frac{\partial I}{\partial t} = n(t)$,

$$I = \int_{t1}^{t2} n(t)dt = \int_{t1}^{t2} [\frac{\partial R_v}{\partial t} - \frac{\partial R_g}{\partial t}] \frac{1}{k} dt = \frac{1}{k}[R_v - R_g] .$$

In other words, the changes potential will be defined by the difference of benefits. When the benefits are equal on the drawn game line, the changes potential is equal to zero, the structure is stable and cannot change, because the game is over. If the change of benefits correlation of the grand master and "second-rated athlete" is so, that value I <0, the benefits of the grand master outweigh the benefits of the "second-rated athlete", and that means that institutional changes do not produce the effect which result from the defined initial goals within the limits of the model. In this case the input of new rules or changes of functional rules are accompanied by systems' dysfunction growth that keeps the initial correlation on benefits and realization of agents' abilities invariable. If I> 0, the benefits of the grand master dwindle with each active action and institutional change, and the ones of the "second-rated athlete" increase. Institutional potential is positive on the assumption of the model conditions.

Again it is necessary to specify, that unfortunately economic models do not take into consideration the institutional changes content, so to provide the victory of the agent with a fortiori poorer qualities we may need only one or two changes. Besides institutional neutrality can mean that changes take place and their velocity is high, but they do not cause the benefits change of both agents, and consequently the general result of their competition. It is possible to have a situation with "negative selection" and "endamagement" to the agent with a fortiori higher moral qualities from the agent with morally poor qualities, modern public institutes in no way keeping from such negative influences.

It is significant to note, that the "chess board" effect is a good example of negative selection when realizing manageable institutional changes, intellectual capital under such conditions is not the guarantor of competitive victory. The agent, who in other circumstances is obliged to win by nature and whose victory is natural, can lose. Certainly, it is supposed in model, that the expenses connected with institutional changes realization are not so great. It will allow not including them into the estimate of the system's standard of well-being. Of course, generally it is necessary to take such expenses into consideration.

The typical model when the benefits of the grand master are reduced and the benefits of the "second-rated athlete" increase was considered above. However, the following variants of system's functioning are possible:

1) the benefits of the grand master are reduced, the benefits of the "second-rated athlete" are invariable at the same level, or the benefits of the grand master are invariable, and the benefits of the "second-rated athlete" increase with the growth of institutional changes in a time unit;

2) the benefits of the grand master increase when the benefits of the "second-rated athlete" are invariable or reduced;

3) the benefits of both the grand master and the "second-rated athlete" grow or decrease simultaneously.

If the benefit of the "second-rated athlete" is insensitive to institutional changes (it does not matter whether the rules change and how quickly because the main thing is contact with the grand master and not the result of the game), then with the reduction of the grand master's benefit the loss of the latter (Figure 2, on the left) will be observed at some value of institutional changes speed. If the benefit of the grand master is insensitive to institutional changes, the benefit of the second-rated

athlete can increase, if changes of the content favour it, then from some changes number N* (Figure 2 on the right) the second-rated athlete will win.

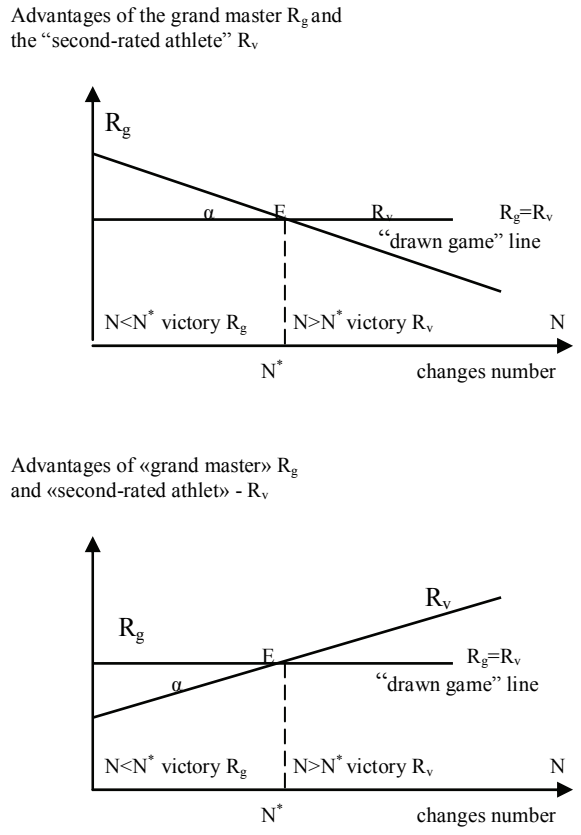

Figure 2. *The scheme reflecting variant 1 model.*

Mathematically the change of benefits in Figure 2 can be presented as follows:

$$\frac{\partial R_g}{\partial t} = \frac{\partial R_v}{\partial t} + tg\alpha \frac{\partial (N^* - N)}{\partial t} = \frac{\partial R_v}{\partial t} - \frac{\partial N}{\partial t} tg\alpha$$

$$\frac{\partial R_g}{\partial t} = \frac{\partial R_v}{\partial t} - n(t) tg\alpha$$

As for variant 2, when the benefits of the grand master increase at invariable or reduced benefits of the second-rated athlete, the situation is described by the victory of the grand master and is graphically presented on Figure 3. We have the same situation at insensibility of the grand master's benefit to institutional changes (experience and the level of change adaptability is very high), when the benefit of the second-rated athlete will be reduced (the lower scheme in Figure 3.) It is a truncated or one-sided institutional neutrality.

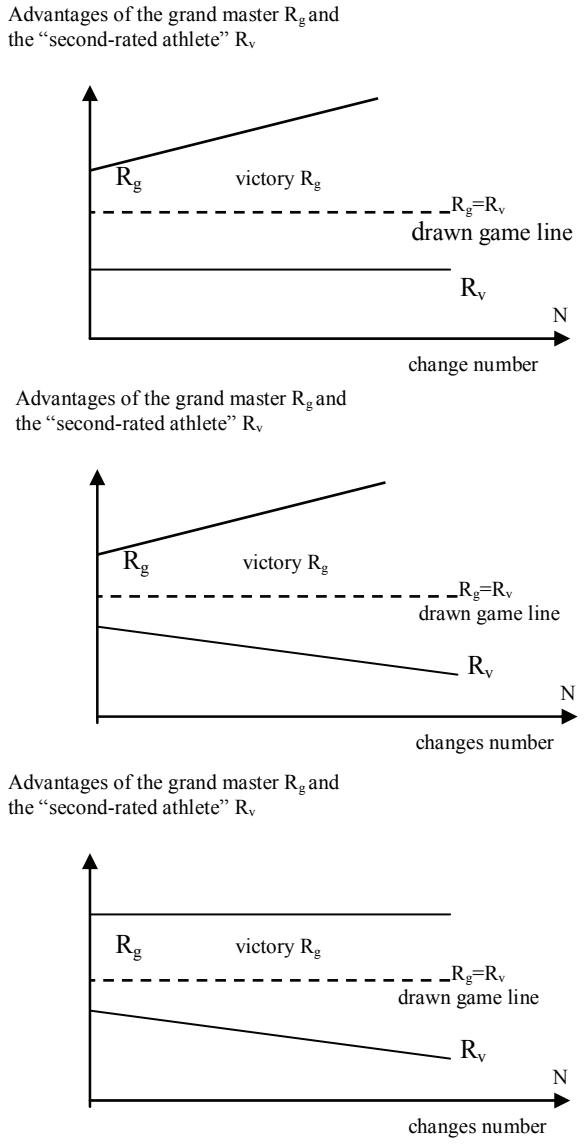

Figure 3. *The scheme reflecting variant 2 model.*

The benefits of the "second-rated athlete" may not change, if it is all the same to him, whether he would win or lose. If he considers the game with the grand master is honourable anyway, these benefits can increase with institutional changes growth in a time unit. Then the general result will depend on how quickly the benefits of the "second-rated athlete" and the grand master increase. At increase of benefits of both agents and the corresponding content of institutional changes and their velocity it is possible to have a situation, when the grand master will lose all the same, despite the benefit growth (Figure 4 on the left).

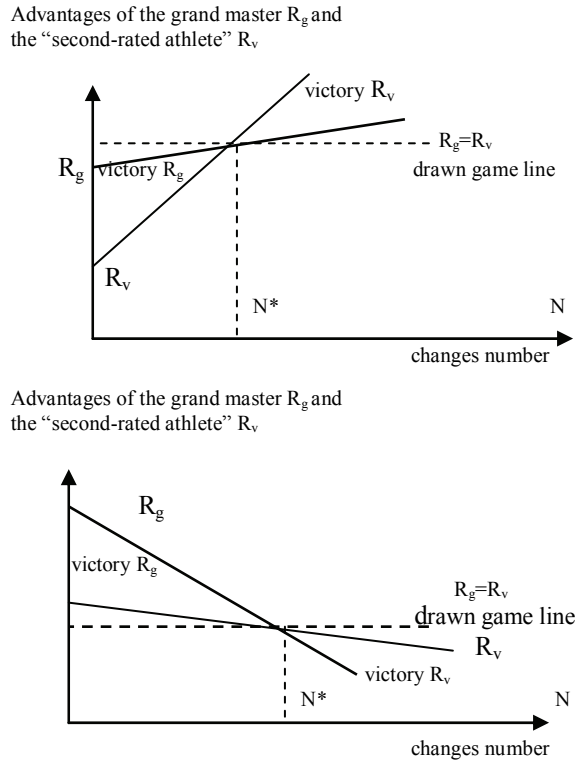

Figure 4. *The scheme reflecting variant 3 model.*

If with the increase of institutional changes in a time unit N the benefits of both the grand master and the "second-rated athlete" are reduced (Figure 4, on the right), the grand master wins on a segment more to the left of N*, and on the segment more to the right the "second-rated athlete" does. Benefits decrease of both game participants is connected with the fact that both of them feel uncomfortable and dissatisfied with the game due to the institutional changes, the necessity of adaptation to them and perceptions. All these demand some efforts and physical, moral and intellectual expenses. Therefore the benefit is reduced for both participants. At the same time the correlation of these benefits and quality of these changes are so, that on one segment the grand master will win all the same and on other he won't. If love for the game per se is so high for the two players with obviously various intellectual capital that it brings great satisfaction, and it is unimportant for them how much the rules of the game change and, moreover, the players can get some additional comfort and interest due to these rules, there will be benefits growth of two players. The victory of one of them will be defined by the correlation of this growth velocity (curves angle of slope), and by the content and frequency of changes.

If the participants of the game are equal in qualification, for example, two grand masters or two "second-rated athletes", the same variants are possible, only with the proviso, that the reaction of the agent will be defined not by the intellectual capital, knowledge and experience (these are the parameters in which the agents are equal), but by the level of health, adaptability characteristics, in particular, and besides for whom the key institutional change is intended. The functions of health reserves and qualification plus the function of adaptation to the game will define the result of such interaction.

Appearance of Russian «financial oligarchy», fast enrichment of dealers and agents in raw materials sectors, the effect of industry's privatization destroying it are the best empirical acknowledgement of the performed analysis. Winning of wittingly second-rate agents and the loss of grand masters (engineers, scientists, teachers, doctors, etc.) has considerably changed the stimulus of economic activities and people's life, motivation within the limits of each trade and has redistributed well-being. Management can either promote involving of intellect in production and decision-making, or, vice versa, can simply liquidate corresponding competitive advantages connected with the use of intellect. As a rule, to restore the positions is either impossible in foreseeable future, or it is possible, but only in some scale. The momentary character of administrative decisions which do not absolutely consider the strategic prospect of system's development, irretrievably affects the given system, though this harm is difficult to perceive by the known ways of analysis.

Institutional changes can affect the well-being of economic system. This aspect is not considered in the standard theory of well-being and is not reflected in the criteria of well-being estimation (V.Pareto-effectiveness, N.Kaldora - J. Hicks, T.Scitovski, A.Bergson, A.Sen, etc.). If the standard of well-being of "grand master- second-rated athlete" system is measured by the total benefits which the agents obtain from participation in the game, then $U = R_g+R_v$. Having expressed the benefits of the grand master R_g through the benefits of the "second-rated athlete" R_v, we will have:

$$U = 2R_v + (tg\alpha + tg\beta)[N^* - N]$$

Well-being change will be:

$$\frac{\partial U}{\partial t} = 2\frac{\partial R_v}{\partial t} - (tg\alpha + tg\beta)\frac{\partial N}{\partial t} = 2\frac{\partial R_v}{\partial t} - kn(t),$$

where

$$k = (tg\alpha + tg\beta)$$

$$n(t) = \frac{\partial N}{\partial t}$$

Thus, well-being change depends on benefit double change of the system's agent least provided with the resource, on changes velocity (the higher the velocity, the less the value of well-being change) and on the agents' adaptation level which is set by slope angle of reactions curves corresponding to the benefits R_g and R_v.

At one-sided institutional neutrality (Figure 2), we will get:

$$\frac{\partial U}{\partial t} = 2\frac{\partial R_v}{\partial t} - tg\alpha\frac{\partial N}{\partial t} = 2\frac{\partial R_v}{\partial t} - n(t)tg\alpha \quad .$$

In this case economic system's well-being will be composed of the well-being of the grand master and the "second-rated athlete" $U=U_g+U_v$. The well-being of the grand master and the "second-rated athlete" is composed of acquired benefits and disposable intellectual capital. It is possible to write down, that $U = R_g+R_v +IK_g +IK_v$, where $U_g = R_g+IK_g$, $U_v = R_v+IK_v$ – the well-being of the grand master and the "second-rated athlete" respectively. As we see, there is a part of well-being which depends on benefits change of the two agents $U_R = R_g+R_v$ and the part of well-being which does not depend on benefits but is entirely defined by the initial intellectual capital $U_S=IK_g+IK_v$. It is possible to consider in the model, that intellectual capital is not spent during game, that is, it does not decrease, and it is possible to imagine that it is increased with new experience or knowledge obtained as the results of game and rivalry. Then this part of well-being will also increase. Change of this part of well-being does not necessarily depend on the level and change of agent's benefits. The benefits of the grand master and the second-rated athlete can be reduced, but intellectual capital will be increased, and if for the second-rated athlete the game is more useful then the intellectual capital augmentation will be greater.

In the event when institutional changes do not influence conditions of accumulation and expenditure of intellectual capital, but result in benefits reduction of the grand master even at the same benefits of the second-rated athlete, there will be decrease of system's well-being. As a result the intellectual capital of the grand master which surpasses the intellectual capital of the second-rated athlete $IK_g > IK_v$, will not allow the grand master to win.

According to the society's rules (stereotypes), the grand master should win. Such outcome of the affair is considered to be natural and effective. If institutional changes destroy this set, then the result could not be called effective, and the general well-being of the system will surely be reduced. Hence, institutional inefficiency arises which reduces the well-being of economic system. Why should the cleverer, more talented, more educated and skilled person always win? The answer is in the change of well-being standard which will be less in case of the "second-rated athlete's" victory. Thus, this circumstance already forms estimation criterion of public welfare level. The opposite outcome is institutionally rejected, that is, the victory of the weakest agent is not the optimum decision. It is in case of the assumption that the intellectual capital of the weakest agent does not increase. If IK_v during the game will approach IK_g, it can cover losses of benefits for the grand master R_g together with depreciation of his intellectual resource alongside with the growth of benefits R_v. It is significant to note that to a large extent this depreciation is conditional, because the grand master has hardly lost his knowledge and experience. There was simply a displacement of the relative estimation connected with institutes' action, to be more precise, with institutional changes. The intellectual capital itself has not changed, at least, significantly.

According to I.Bentham, the purpose of system's well-being maximization will be achieved at well-beings sum maximization of the agents comprising this system (utilities, benefits). According to John Rawls maximization of system's well-being is achieved at well-being maximization of the agent who is in the worst position. It is possible to express these two criteria in the following way:

$$U \rightarrow \max(\text{according to I.Bentham})$$

$$U_V = R_V + IK_v \rightarrow \max(\text{according to John Rawls})$$

In other words, institutional changes providing winning to the "second-rated athlete" promote the general well-being increase. Incidentally, if in addition to that the well-being of the grand master is not reduced, then according to I. Bentham there is well-being increase as U_v t is a part of U. At the same time it is necessary to notice that expenses for institutional changes and players' relations with those who and in whose interests this or that rule is

changed according to its content and with this or that frequency (velocity), do not appear in the model. When the number of the "second-rated athlete" increase in economic system and intellectual capital of the grand masters relatively depreciates, it is inappropriate to speak about the increase of system's well-being, at least until the "second-rated athletes", having obtained the benefit from the winning, spend it on education to reach or approach the level of the grand master. It is not the fact at all that elimination of grand masters' domination in the economy with the strengthening of the "second-rated athletes" leading part will raise the well-being of public system. Yes, the benefits of the second-rated athletes will increase, but the intellectual capital of the grand masters will not be involved. Besides their benefits will go down. The general result will be defined by this correlation, and Rawls criterion, as well as a number of other estimation criteria of well-being level (Pareto, Kaldor-Hicks, Scitovsky), are not quite applicable, to put it mildly, as they were designed with the assumption of non-influence of institutional changes on agents' well-being and behaviour (benefits).

In Figures 1 and 4 Pareto-effective system's condition is a point of equilibrium as at movement from this point there is a situation when some agent relative to another one is better, so he wins, but another one is necessarily worse, so he loses. In this point $R_g=R_v$ and $U = 2R_v$. Thus there is a "drawn game" in the given point as a result but the standard of well-being is not maximum, as at $N < N^*$ the function is $U > 2R_v$. At such number of institutional changes in a time unit, that is, velocity, N^* reaches the Pareto-optimum result at corresponding curves slopes R_g and R_v, but it does not provide the greatest system's well-being.

At one-sided institutional neutrality (Figure 2) there is a possible situation when from point N^* the position of one agent (benefit growth) improves and the position of another one does not worsen. It means that this point stops to be the Pareto-efficiency point. When the benefit of one agent does not change, and the benefit of another is reduced with the growth of changes number (Figure 3, below), it is undesirable to carry out institutional changes. They will obviously reduce the system's well-being. If the benefit of one agent does not change, and the benefit of another one increases (Figure 3, on the left), the changes are possible and their velocity should be defined by necessary estimation of benefit increase of one of the agents.

Kaldor-Hicks criterion will be suitable at institutional changes if it is possible to have a change of move that acts as the certain analogue of compensation correcting benefit. In other variant compensation is impossible, if only the model of fee possibility for the victory is not introduced when the defeated party can share the fee of the winner with the won agent. Here a collusion is possible, and the model will have absolutely different perspective. And Scitovsky criterion, on the contrary, should impose a ban for a change of move. In Figure 3, on the right, there is a situation when benefit of the grand master increases from the number of changes, and the one of the second-rated athlete is reduced. At growth of N only grand master is better at once and the second-rated athlete is simultaneously worse. Hence, in point N=0 there was a Pareto-effective condition, as the deviation from it, improving the condition of one agent occurs only with the worsening of the condition of another one. Thus, this case demonstrates that institutional changes should not be carried out. Basically, the general idea of the suggested model assumes negative influence of institutional changes on the result of economic agents' interaction with unequal intellectual capital.

It is extremely important to note, that standard criteria of public welfare estimation are certain institutional standards which are far from the systems idea and vision of well-being standard and its change.

If initial well-being standards of co-operating agents are known, and the term well-being is equivalently defined between all the agents and approved by them, the well-being improvement of one of them leads to the general standard of well-being increase without worsening of other agents' well-being irrespective of what level of well-being scale this agent is.

If institutional changes affect the basic rules of chess game and the behaviour of players, for example, the rule "not to allow the change of move" and the rule "has touched a figure, should make a move if the given agent has the right of a move", or the moves of the chessmen, the game result of equal in the intellectual capital partners will be equally probable and will depend on a position in which the intensive specified changes have begun (they can begin not with the first moves but later) and other factors. However, the loss of one grand master to another will produce the loss of system's well-being as intellectual capital of two agents is

approximately identical, and benefits from the interaction within the limits of the game are redistributed. One of them loses, another wins.

Thus, in the short run institutional changes do not have smaller value than in the long run of economy functioning. They correct at once the behaviour vector of agents, their model, reaction; they change benefits and basic economic proportion, correlation of received benefits and losses at their interaction.

Conclusion

The presented model of institutional changes considered in detail allows making the main demands to economic policy:

a) institutional changes velocity (their frequency) should provide natural result which in economy with prevailing inter-specific resources comes to the rise of more educated, skilled, competent agent (intellectual capital possessor). It is this condition that is fundamental in respect of innovative type stimulus designing of economic growth;

b) the content of any changes should assume the estimation of the system's well-being change;

c) competition in economic system depends on the character, the content of institutional changes and the fundamental institutes influencing rivalry mechanisms heavily, negative selection becoming the integral element of modern competition determined by the institutes;

d) institutional changes have the property, the essence of which is that until they have not occurred, it is difficult to estimate their content, because the result which the system will have is not absolutely clear. Certainly, it creates the basic difficulties in the models use of institutional changes and in obtaining such models;

e) probably it is not absolutely correct to transfer conclusions received on the model "grand master-second-rated athlete" on the estimation of acceptable speed of institutional changes concerning the whole sectors of economic system though the revealed basic regularity, in my opinion, will remain. Changes of institutes can provoke negative selection and bring down the well-being of economic system. That is why it is necessary to have special criteria within the limits of economic policy designing and in the framework of institutional planning;

f) institutional changes can considerably affect the well-being of economic system, and no one of the known classical estimation criteria of a well-being standard take this aspect into consideration;

g) there is a paradoxical result, which says that, on the one hand, the second-rated athlete's victory is the infringement of stereotype (standard) institutes and is connected with institutional inefficiency caused by velocity increase of institutional changes at their corresponding content and, on the other hand, according to the Rawls criterion, well-being increase of the weakest (poorest) agent will increase public well-being as well, and in this case the well-being of the second-rated athlete increases because of his victory and benefits growth R_v, the intellectual capital not changing IK_v. The intellectual capital of the grand master has not also disappeared anywhere, it remained the same, but the benefits were reduced with the loss. Then it is important to find out, whether the benefit losses of the grand master have transformed into the benefit of the "second-rated athlete" or not. It is important from the position of Bentham criterion about the total well-being of the system as if such "transformation" is possible, institutional changes will result only in well-being redistribution, but cannot affect its general level at all. However, at expenses for institutional changes losses in well-being still become essential. Besides, there is relative depreciation of intellectual potential of the grand master that alters stimuli structure in economic system.

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