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Forecasting the Evolution of Economic Institutions

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Abstract

The paper considers the existing approaches to forecasting development of institutions. It shows drawbacks of the existing approaches and proposes an approach to forecasting the evolution of institutions based on assessment of their impact on the level of transaction costs of economic agents. The possibilities of the proposed approach to explain the phenomena of institutional trap are shown. On the base of transaction approach an adequate model of interaction between economic agents and institutions is developed which allows to forecasting the institution dissemination among economic agents. Also this model allows to forecasting emergence the institutional traps.

Keywords: Institutional environment, evolution of institutions, forecasting, transaction costs.

Introduction

Despite significant criticism of the Russian economy modernization processes and mechanisms one cannot deny the achievements reached in this area. However, there are more mistakes and failures than actual results on this way. One of the reasons is that the Russian and global authorities don't have satisfactory methods to forecast success of institutional reforms and effects of government spending on economic growth[1]. The main criterion for making reforming decisions is the experience of their application in other regions and countries[2]. Though this works only on equal terms, and the Russian economy is quite specific. The impact of this specificity on the success of institutional reforms can be regarded only intuitively by now. Theoretically there should exist a method to forecast dissemination and development of the imported and projected institutions.

There are many methodological approaches to forecasting evolution of the institutions. G. Hodgson[3] regards in his article the main directions of recent researches that focus on issues of the institutions' origins. However the modern models of the institutions' origins do not allow forecasting dynamics of their dissemination.

Speed of dissemination of a new institution can be forecasted within the institution's life cycle theory. E. Popov[4] develops in his article an interesting model of the evolution of economic institutions, which is based on the life cycle theory and diffusion of institutions. However this model cannot explain dissemination and allocation of inefficient institutions.

But they can be explained by the V. Polterovich's[5] theory of institutional traps, related with effect of the path of previous development ("path dependence" effect)[6] and blocking effect[7]. The institutional traps can also be explained by paradoxes of group choice[8] and influence of ideology[9].

G. Suleimanova[10] regards in her article three approaches to forecasting the institutional evolution. They are factor, genetic and normative approaches. Factor approach per se is a sort of econometric forecasting tool applied to forecasting the institutional evolution. A disadvantage of the factor approach to forecasting is underestimation of the institutional structure's influence. Finally the factor approach can forecast dissemination of an institution on a short-term base only. The genetic approach implies inertial developmental character, the blocking effects that cause it and the effect of the path of previous development. The genetic approach takes into account the existing institutional structure, but it is not capable to forecast the change of the institutional sets. The normative approach is based on the development aims that are to be achieved and the theory of self-fulfilling forecasts. However this approach doesn't consider inertia of institutional development and institutional traps.

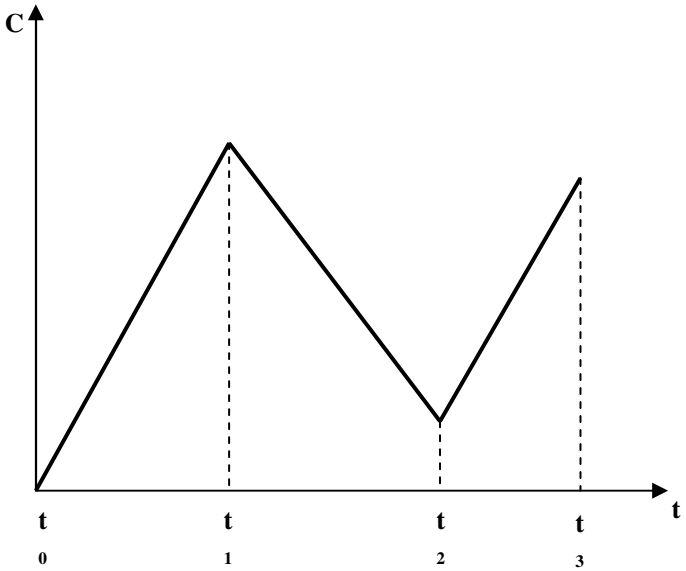
Another interesting approach to forecasting the evolution of political institutions is based on the analytic hierarchy process. An ingenious attempt to model the process of the Spanish monarchy's evolution with the help of this method is taken in the work of V. Stepin[11]. The analytic hierarchy process structures and formalizes the main parameters of a system of actors at a definite period of the institution's evolution, and basing on the expert estimation procedure it provides qualitative estimations of: i. level of importance of different political actors in a political system, ii. level of importance of different aims and policies at the present, iii. an opportunity determined by the actors' parameters of strengthening or weakening positions of the institution in political system of a country.

Despite its simplicity the given method has a big disadvantage connected with subjectivity of the expert estimations.

Thus, there are many approaches to forecasting the institutional evolution, but most of them have significant disadvantages restricting their feasibility. A generalizing approach is needed to be developed to meet the following conditions: i. ability to explain success and disadvantages of importing and projecting the economic institutions, ii. ability to develop various models of the institutional evolution and to perform forecasting calculations based on the models, iii. practical applicability for management at macro and meso-levels as minimum.

Material and methods

We consider that the article of E. Popov[4] comprises seeds for such an approach. He developed a model of diffusion of an institution based on empirical estimations of the transaction costs level, i.e. he revealed interconnection between dissemination of an institution and change of the transaction costs level. Moreover the relation is harmonical. During formation of new institution the costs increase, which is due to the processes of learning and mastering, and during mainstream use the costs decrease, which can be explained by positive influence of the mastered institution (figure 1).



t_1 - completion of phase of formation of the institution; t_2 - completion of phase of mass usage of the institution; t_3 - completion of phase destruction of the institution

Figure-1
Dependence of the magnitude of transaction costs from the life cycle of the institution

Under that logic there can exist inverse relationship between the level of transaction costs connected with switching to a new institution and its dissemination speed. One might also assume that there is connection between transactional efficiency of an institution (capability to decrease transaction costs) and its attractiveness for potential users. Finally forecasting the institutional evolution can be carried out on basis of three parameters: level of current transaction costs of economic actors, level of transaction costs connected with switching and mastering a new institution, and capability of the new institution to decrease transaction costs (transaction efficiency).

This approach is the most relevant for forecasting the evolution of the institutions of the innovative environment, because level of transaction costs in this sphere is the highest, often prohibitively high in Russia, which can explain weak development of innovations in Russia in spite of all governmental efforts.

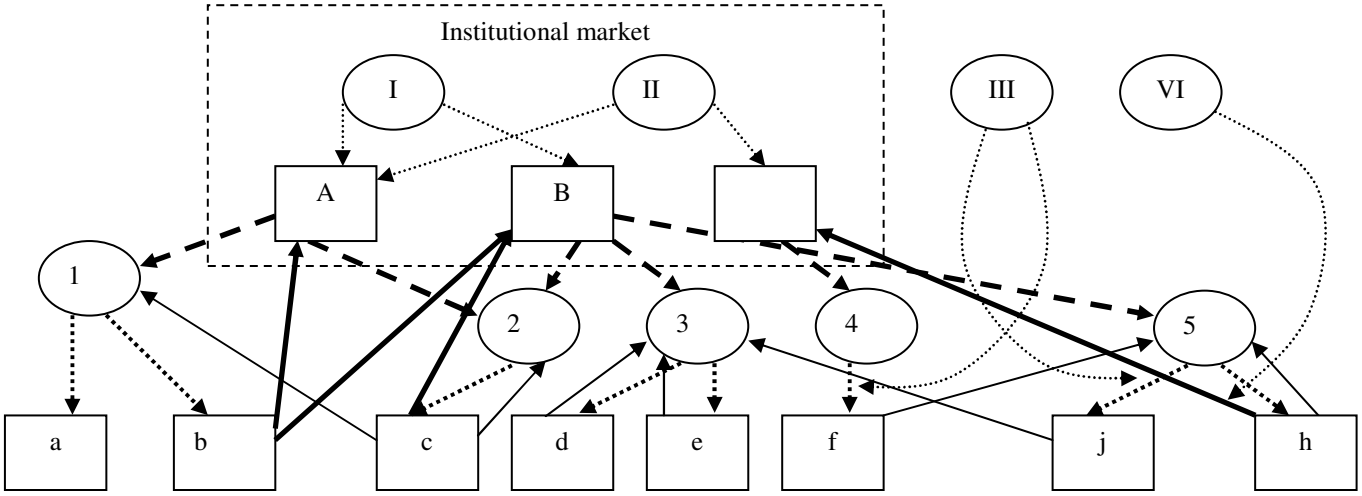
The most interesting question is how the current level of transaction costs of economic agents impact on choice of an institution. If the current level is prohibitively high, i.e. intellectual property is not used and doesn't produce profit, then most probably that an economic agent will choose institution, which is the most efficient in transaction, i.e. which decreases transaction costs to the utmost. If the current transaction costs are not prohibitively high, the agent will choose the institution, which demands the least costs to mastering. The same works for the situation, when efficiency of institutions in transaction is unknown.

To forecast formation and efficient work of the institutions it is necessary to develop an adequate model of interaction between the economic agents and the institutions. It must be noted that such a model will a priori have nonlinear character and be defined by the loop of positive feedback. On the one hand, the developed institutional environment impact on the level of activity of the economic agents. On the other hand the increasing activity of economic agents will cause formation of a network of users of these institutions and increasing of demand for the institutions and institutional changes including improvement (modernization) of the existing institutions and introduction of new ones with the help of importing and projecting.

Considering that this area is hard to modeling, it is necessary to choose strictly both the abstract (qualitative) model that will provide the basis for the mathematical model being developed and choice of the mathematical tools for modeling.

In our opinion an improved genetic model of innovations[12] can be used as an abstract (qualitative) model that defines the most precisely the essence of interaction between economic agents and institutional environment.

The genetic model of the interaction between economic agents and institutional environment can be represented pictorially in the following way (figure 2).



Type Codes:

◯- institutions. The Roman numerals are used for the institutions of a higher level, which either make game rules in the institutional market or they are the institutional environment of a higher level. The Arabic numerals are used for the institutions of a lower level;
□- economic agents. The agents of the institutional and political market that are on the side of the institutional supply are written in Capitals. Lower case letters are used for the agents that are on the demand side.
⋯►- impact of the institutions of a higher level on participants of the institutional market and institutions of a lower level;
▬►- institutional supply (institutional projecting)
——►- demand for institutional changes (dissatisfaction with the existing institutions or their insufficiency);
····►- stimulating (anti-stimulating) effect of the institution on behavior of economic agents;
——►- appealing to the institution (using the respective provisions and rules during implementation of the transactions).

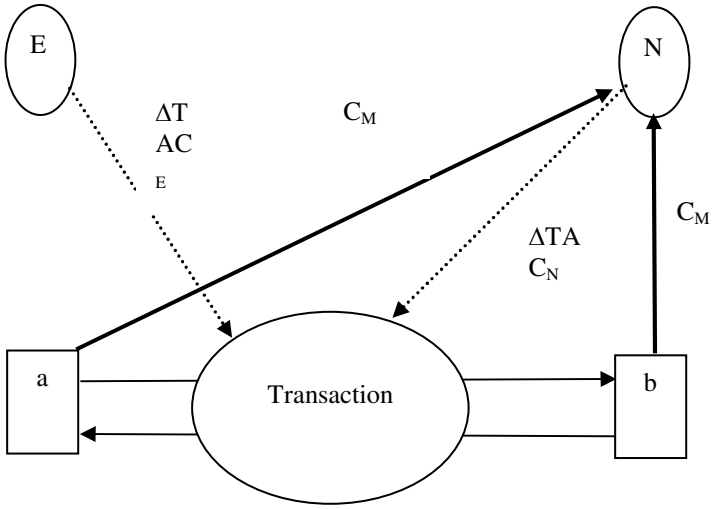
Figure-2
The genetic model of interaction between economic agents and institutions

The model shows that situations of interaction between economic agents and institutions are various. For example, the 4th institution is not in demand though it impacts somehow on the economic agent f, which in its turn appeals to the 5th institution. Low demand for the 4th institution is connected with the fact that its activity is leveled out by the III institution of a higher level. The most demanded institution is number 3; it is appealed by three economic agents, which are all satisfied with the existing institution. The economic agent b is not satisfied with any existing institutions, that is why it demands of institutional changes toward two agents of the institutional market – A and B, which are quite efficient. In their turns they are influenced by the institutions I and II of a higher level.

Of course, this model is too sophisticated and needs to be simplified despite its including almost all actual interactions between institutions and economic agents. It can be made by excluding from analysis the institutions of a higher level considering that the institutional supply is defined exogenous.

Results and Discussion

The model of interaction between the economic entities and institutions can be presented in the following graphic way (Figure 3).



E – existing institution; N – new (modernized) institution; ΔTAC_E – saving of transaction costs by using the existing institution; ΔTAC_N – saving of transaction costs by using a new institution; C_M – costs of mastering the new institution.

Figure-3
The model of interaction between economic entities and institutions

The model can be presented like that:

$$\begin{cases} N_N = 0; \\ N_N \to K; \\ N_N(t) = \dfrac{KN_0 e^{rt}}{K + N_0(e^{rt} - 1)}, where \lim\limits_{t \to \infty} N_N(t) = K; \\ N_N \to 0. \end{cases}$$

$$\begin{cases} \Delta TAC_N \le \Delta TAC_E \\ \Delta TAC_N > \Delta(TAC_E + C_M) \\ \Delta TAC_E < \Delta TAC_N \le (\Delta TAC_E + C_M) \\ \Delta TAC_E < \Delta TAC_N << C_M \end{cases} \quad (1)$$

where N_N – number of participants of the economic activity who use the new institution; N_0 – initial number of participants of the economic activity who use the new institution; K – total number of participants of the economic activity; r – speed of spreading of the new institution, $r = F(\Delta TAC_N - \Delta TAC_E)$

Several scenarios are possible: A new institution provides the same or worse decrease of the transaction costs as the existing one, i.e. $\Delta TAC_N \le \Delta TAC_E$. In this case the probability that the economic agents would use the new institution in their transactions is equal to zero.

A new institution provides so much strong decrease of the transaction costs that the outcomes of using it surpass even costs of its mastering: $\Delta TAC_N \ge (\Delta TAC_E + C_M)$. In this case the probability that the economic agents would use the new institution in their transactions is equal to unity. Such institution would be disseminated among economic agents quite quickly.

A new institution provides such decrease of the transaction costs that the outcomes of using it surpass the decrease of the transaction costs provides by using the existing institution, but do not surpass the costs of its mastering: $\Delta TAC_E < \Delta TAC_N < (\Delta TAC_E + C_M)$. In this case the probability that the economic agents would use the new institution in their transactions is above zero but not equal to unity. Several scenarios are possible depending on how different the costs of mastering the new institution are. If costs of economic agents are approximately on the same level then switching of one of them would bring to switching of the second one. If the costs of mastering are not the same then dissemination of the institution would be diffusion-based, this is outlined in figure 4 by a logistic curve characterizing the positive feedback between the number of agents – users of the institution and attractiveness of the institution for the rest, as shown in the examples of training the workforce in Iran[13] and relationship between cause-related marketing campaigns and the impact generated on the corporations, non-profit organizations and consumers in Romania[14].

A new institution provides such decrease of the transaction costs that the outcomes of using it surpass the transaction costs saving of using the existing institution, but the costs of its mastering are prohibitively high: $\Delta TAC_E < \Delta TAC_N << C_M$. In this case the probability that the economic agents would use the new institution in their transactions is next to zero. This situation describes the institutional trap when existing institution is not the most efficient, but switch to a new one is blocked by the prohibitively high level of the transaction costs of its mastering as shown in the example of the introduction of Strategic Supply Chain Management (SSGM) in India[15].

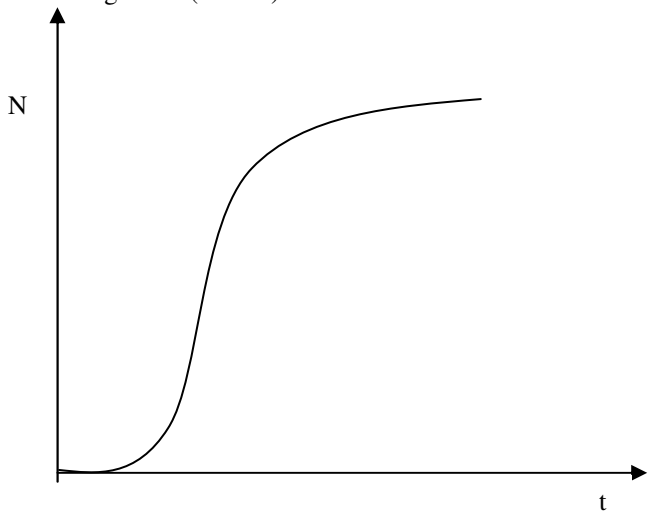


Figure-4
Logistic curve of dissemination of an institution

Conclusion

Thus application of the transaction approach to forecasting evolution of institutions allows explaining the problems and phenomena in the institutional environment and developing an adequate model of dissemination of new institutions among economic agents.

However it is not enough to take into account the transaction costs only for the full-scale forecasting the institutional evolution. The outcomes of the transactions in complex and difference between the income (positive effect) from the transaction and all the transaction and transformation costs need to be taken into account as well. This is due to the fact that an efficient institution would not only decrease the transaction costs, but also increase efficiency of the transaction. The author has developed the approach to simulation modeling of innovative behavior of economic agents on the basis of complex transactions effect described in the articles[16,17]. This approach can be applied for forecasting the evolution of the institutions

through modeling interaction between economic agents and institutions.

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