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Provision of Economic Security by Creating Innovation Network of Transnational Cluster Initiatives

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Abstract:
The article is devoted to the study of perspectives of creating innovational network of transnational cluster initiatives for provision of economic security of modern economic systems. The authors determine the notion of transnational cluster initiatives and allocate their peculiar features as compared to traditional clusters. The authors analyze statistical information about economic security of developed and developing countries of the world and build a model of economic security of modern economic system before and after creation of innovational network of transnational cluster initiatives. The advantage of forming transnational clusters for national economy consists in expansion of international innovational and technological cooperation and use of world practice of commercialization of technologies which covers the whole innovational cycle – from fundamental research to realization of final products in the world market, including marketing of science-intensive goods and services.

Key Words: *Economic Security, Economic System, Economic Growth, Innovational Network of Transnational Cluster Initiatives*

JEL Classification :

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1. Introduction

The problem of the research consists in the fact that under modern conditions of unstable development of the global economy, the situation in the sphere of provision of economic systems economic security aggravates. This leads to polarization of the global economy and deepening differentiation of development of various countries of the world.

The gap between developed and developing countries becomes deeper and more insurmountable, which raises the contradiction of their interests and leads to emergence of international political conflicts which are solved by military methods, leading to slow economic growth of not only the members of such conflicts but of other countries as well.

The problem of provision of economic growth is solves with the help of strengthening of state regulation of economy. This tool is viewed in the works of such scientists as Walerud and Viachka (Walerud & Viachka, 2012), Köcker and Buhl (Köcker & Buhl, 2007), Level (Level, 2010), and in the study Innovation clusters in Europe, 2014.

It is worth noting that the use of instruments of state regulations violates the usual functioning of market's mechanism, leads to reduction of competition, and slows down the rates of economic growth. State regulation does now allow solving the problem of provision of economic security, while having low efficiency, which causes the necessity for the search for new tools for provision of economic growth.
This research offers a hypothesis that economic security of modern economic systems can and should be provided by creation of innovational network of transnational cluster initiatives. Verification of this hypothesis supposes solving the following tasks of the research.

Economic security determines the sovereignty of economic systems and stability of their development in the perspective and development of the global economy on the whole. That's why the study of new perspective tools of provision of economic security has a high practical value for modern countries of the world – it expands their instrumentarium in the provision of economic security allowing achieving high rates of economic growth - as well as theoretical value, as it develops the theory of economic security and economic growth.

2. Method

The authors use the methods of comparative analysis for determining and limiting traditional and transnational cluster initiatives, as well as methods of comparative analysis of statistical information in the sphere of transnational cluster initiatives. The authors also use the method of economic & mathematical modeling of economic security of modern economic systems and forecasting changes of economic security of modern economic systems under the conditions of creation of innovational network of transnational cluster initiatives.

The authors also use structural & functional analysis for determining genesis of existing situation in the sphere of economic security of modern economic systems of developed and developing countries, and problem analysis – for determining problems in the sphere of provision of economic security of modern economic systems by the example of various countries of the world.

Economic security has a complex internal structure which includes three main elements (Grinavtseva 2013):

– economic independence, which under the modern conditions means interdependence of national economies within international division of labor, possibility for the state's control of national resources, and achieving such level of production efficiency and production quality which ensure their competitiveness and allow participating in the global trade, cooperation ties, and exchange of scientific & technical inventions;

– stability and sustainability of national economy, supposing protection of property in all its forms, creation of reliable conditions and guarantees for entrepreneurial activity, restraining the factors which can destabilize the situation (fight against criminal structures in economy and against serious gaps in distribution of income which can lead to social disruptions, etc.);

– capability for self-development, i.e., creation of favorable investment climate, continuous modernization of production, increase of professional educational and cultural level of employees.

Each component of the structure of economic security is detalized by a range of specific economic indicators which show the level of economic security. Multiple researchers of this problem offer a lot of (up to several hundreds) indicators of economic security.

Indicators and criteria of economic security is a tool for evaluation of the state of economy from the point of view of the most important processes which reflect the sense of economic security. Evaluation is done for resource provision and existing

possibilities for its development; efficiency of ways and methods of use of resources, including capital and labor, their correspondence to the level of development in developed countries and to the level, at which external and internal threats may be minimal; competitiveness of economy; integrity of territory and state space; sovereignty, independence, and capability to oppose external threats; social stability and conditions for preventing and solving possible social conflicts. Among the indicators of economic security, most often the following are allocated (Moskovtsev and Zageeva, 2007):

1. economic growth (dynamics and structure of national production and income, indicators of volumes and rates of industrial production, sectorial structure of economy and dynamics of particular spheres, capital investments, etc.);

2. characterizing natural & resource, production, and scientific & technical potential of country;

3. characterizing dynamics and adaptability of economic mechanism, as well as its dependence on external factors (inflation rate, deficit of consolidated budget, influence of external economic factors, stability of national currency, internal and external debt);

4. quality of living (GDP per capita, level of income differentiation, provision of main groups of population with material goods and services, labor ability of population, state of environment, etc.).

All indicators of the state of economic security can be conventionally divided into three groups:

1. internal (volume of GDP per capita, share in GDP of investments into main capital, share of high-tech products in general volume of industrial production, unemployment level, internal debt, deficit of state budget, volume of state reserves, etc.);
2. external (share of the country in the global GDP, in the global export and import, size of external debt);
3. mixed (share of export and import in GDP, share of foreign investments in their total volume, share of foreign capital in financial & credit sphere, ratio of volume of foreign currency in cash to the volume of national currency in cash, volume of capital export and its share in GDP, etc.).

Each indicator has a so called threshold value – the exceeding of which will mean the threat to economic security. These indicators can be developed particular for

each country (for example, as a level of threshold value, a deficit of state budget can be taken – 3%, ratio of external and internal debt to GDP – 60%, investments into main capital – 25% of GDP, etc.), or there may be used universal ones (thus, gold and currency reserves – according to IMF recommendations – should constitute the value of three-month import).

Threshold levels of security reduction characterize, in particular (Moiseeva, 2013):

- maximum allowable limit of reduction of economic activity, volumes of production, investment, and financing, beyond which it is impossible for the country's economy to develop independently at the technically modern and competitive basis, to preserve democratic foundations of social order, keep defense, scientific & technical, innovational, investment, and educational potential;

- maximum allowable reduction of the level and quality of life of most of population, beyond which there appears a threat of uncontrolled social, labor, interethnic, and other conflicts; there appears a threat of loss of the most productive part of national "human capital" and nation, as an organic part of civilized community;

- maximum allowable level of reduction of costs for support and reproduction of natural and ecological potential, beyond which there is a threat for irreversible destruction of elements of natural environment, loss of vitally important resources for economic growth, and substantial territories for living, production location, and recreation, and irreparable damage to health of current and future generations, etc.

Let us view main levels of economic security as to space localization of economic systems of various levels (Bogomolova, 2012).

1. Mega-economic, global level. Economic interests of the whole global economy. They consist in preservation of main parameters of economic life. In this case, we're speaking about international economic security. The threats to the global economic security are the following (Ainabek, 2013):

- global financial crisis;
- global energy crisis;
- anthropogenic and natural catastrophes and large terroristic acts which cause destruction or paralysis of life support systems of many countries;
- military conflicts, local and world wars.

These threats can misbalance the global economic order, and their consequences can influence most of the countries of the world.
At present, the global financial crisis, provoked by the US Federal Reserve System, negatively influences the Russian economy as well.

2. Level of the group of countries (economic blocks, integration associations). For the purpose of full realization of national interests in the global economic environment, separate countries unite into various integrating groups.
Implementation of such international economic interests consists in the necessity for protection or acquisition of certain advantages in the global markets of goods and services which are highly competitive. Integration group allows uniting economic resources of several states (Antropova *et al.*, 2015).In this case, threats to economic security come from states or blocks which have greater resources and which conduct economic expansion as to other countries.

3. Macroeconomic level is presented by national economy and, correspondingly, by national economic interests.

National economic interests are viewed by most authors as main element during study of the problem of economic security (Tang, 2015).It is possible to determine the levels of economic security as to another principle: international (global and regional), national, local (regional or sectorial within country), and private (company and person). Economic security has a rather complex structure and reflects the possibility of emergence of two types of threats (Moskovtseva, 2014):

– endogenous (internal), the source of which lies within the state and national economy;
– exogenous (external) – their source lies beyond national economy, in the external world.

Endogenous and exogenous threats are closely connected and intertwined. The initial, basic, threats are endogenous, as the threats of external character are mostly the consequence of internal problems and contradictions. Thus, economic crisis in the country, decline of production, inflation, and large external debt, as a rule, cause economic losses to companies in the global market.

3. Results

In order to determine the level of economic security in various countries of the world, let us consider the statistical information, prepared by Legatum Institute and analyze the Legatum Prosperity Index. Statistical data, used in the rankings, are

obtained from the UN, World Bank, Organization for Economic Cooperation and Development, World Trade Organization, Gallup, Economist Intelligence Unit, IDC, Pyramid Research, and other institutions (Table 1).

Table 1. Rankings of the countries according to the Legatum Prosperity Index (The 2014 Legatum Prosperity Index, 2014)

General position as to welfare	Country	Economy	Entrepreneurship	State management	Education	Healthcare	Security	Personal freedom	Social capital
Developed countries									
1	Norway	3	7	7	5	5	6	2	1
2	Switzerland	1	3	1	21	3	11	12	9
10	USA	17	11	12	11	1	31	21	7
13	Great Britain	28	8	10	20	19	21	10	12
Developing countries									
47	Saudi Arabia	24	49	49	28	45	72	136	21
49	Brazil	37	51	63	86	63	86	27	65
54	China	6	65	66	61	66	97	117	24
68	Russia	57	46	113	37	44	96	124	67

As is seen from Table 1, the level of economic security differs in each group of countries. Thus, the level of economic security in developed countries (Norway, Switzerland, USA, and Great Britain) significantly exceeds the level of economic security in developing countries (Saudi Arabia, Brazil, China, and Russia).

The key problems of economic security in developed countries are problems in the sphere of education and security. In developing countries, the problems of state management and personal freedom are the key ones. Both categories of countries share the economic problem of maximization of GDP which can be solved with the help of creation of innovational networks of transnational cluster initiatives.

Let us use the methods of economic & mathematical modeling of economic security of modern economic systems and forecasting the changes of economic security of modern economic system under the conditions of creation of innovational network of transnational cluster initiatives. The model of economic security of modern economic system has the following form:

$$ES=(E+E+SM+E+H+S+PF+SC)/8 \quad (1)$$

where ES – economic security;
E – economy;
E – entrepreneurship;
SM – state management;
E – education;
H – healthcare;
S – security;
PF – private freedom;
SC – social capital.

The mentioned indicators are evaluated by the methods of expert evaluation on the basis of statistical information or by the scale (for example, 10-point scale), or by ranking methods for all countries of the world. As a result of creation of innovational network of transnational cluster initiatives, there is an improvement of such indicators as economy (level of GDP) by means of development of production, entrepreneurship, education, and social capital.

This leads to the increase of the indicators of economic security – so the model of economic security of modern system, after the creation of innovational network of transnational cluster initiatives, will have the following form:

$$ES=(E+E+SM+E+H+S+PF+SC)/8 \quad (2)$$

At present, clusters expand the scale of its activities and go beyond particular states. Nowadays, there are many transnational and transborder clusters, as well as transnational cluster networks and other forms of partnership (Popkova & Tinyakova, 2013a).

There is no stable definition of transborder and transnational clusters and no notion of transnational cluster networks. For example, in the official EU documents, transnational cluster networks are understood as "network which includes clusters of two or more countries…" At that, transnational cluster differs from networks by the fact that "clusters are not members but a cluster organization. However, they are similar to transnational networks due to the fact that they cover two or more countries" (Walerud & Viachka, 2012). Thus, the main distinctive feature of transborder and transnational cluster is the presence (or absence) of common border between them.

The countries of the EU are leaders in creation of transnational clusters and transnational cluster networks. The examples of the clusters are: Alsace Biovalley – biotechnologies cluster (France, Germany, and Czech Republic); Nano Öresund – cluster of micro- and nanotechnologies (Denmark and Sweden); GreenConServe – construction cluster (Norway, France, Belgium, Finland); PACMAn – food cluster (Italy, France, Germany, Spain, Portugal, Cyprus). The example of transnational cluster network is the European Food Alliance (EFA) which includes 9 European food clusters with the common goal – providing agrofood companies with service and networks of contacts in the whole Europe.

Transnational partnership of the European clusters expands the geography of its activity and goes beyond Europe. For example, FINE (Food Innovation Network Europe) is a network uniting the largest European clusters of food production (East Netherlands (project leader), East and West Flanders (Belgium), Øresund (Denmark-Sweden), Rogaland (Norway), Scotland (Great Britain), Castilla y Leon (Spain), Emilia-Romagna (Italy), and Wielkopolska (Poland). FINE cooperates with North Rhine-Westphalia (Germany) and Rhône-Alpes (France) and with the companies of Japan (International partnerships, 2012).

Another example is the joint project of eight clusters of Europe, WIINTECH, in the sphere of environmentally friendly technologies, the aim of which is not just the strengthening of relations within the EU but active cooperation with the countries of the North and South America, Asia, North Africa, and Russia (Project WIINTECH, 2007). At present, the project includes the following clusters: French Plastipolis, Austrian Clusterland, Italian Proplast and Veneto nanotech, Spanish Plastival, German Bayern Chemie Cluster, British NEPIC, and Portuguese Poolnet. Organizational and legal form of interaction of clusters in this project is consortium.
Transnational cooperation of clusters in the EU can take one of three forms: cooperation on the informal basis, i.e., without registering additional agreements, save ones for the purpose of informational exchange and allocation of potential possibilities for local activities in a certain direction; agreement on coordination of activities (increasing the critical mass for research and development of innovational products or joint participation in tender); formation of transnational cluster or cross-cluster network of cooperation, i.e., integration of resources for joint production and entering new markets.

The examples of transnational cooperation of clusters are: European Aerospace Cluster Partnership (EACP) – network which unites partners of 34 aerospace clusters from 13 countries of the EU (Official launch of the CLUNET, 2009); CLUSTERPLAST – cross-cluster partnership, created for provision of cooperation in scientific research and technological development between regional authorities, business structure, and scientific organizations. Within CLUSTERPLAST, there is

project EPCI (European Polymer Converting Industry), aimed at the development of the European polymer industry. The project includes 50,000 companies from 6 European clusters (Inter-cluster initiative, 2009).

For the purpose of development of transborder international cooperation, there was created the online European platform for cluster collaboration (Cluster Collaboration Platform, ECCP). Beginning from its start (29.09.2010), the platform became an important tool for increasing internationalization of clusters, which is proved by the number of registered users (1,567 registered users and 817 clusters) and conducted events. In particular, the memos for cooperation of the European clusters with Japan, India, South Korea, Tunisia, and Brazil were signed (Reiss-Schmidt P. 800, 2012).
On the whole, development of transnational clusters and networks goes according to the new strategy of innovational development of the EU, where clusters are defined as a powerful tool for innovational and industrial policy, capable to strengthen positions of Europe in global competition.

Due to that, the European Commission recommends the EU members to actively develop cross-cluster transnational ties and concentrate on the formation of clusters of the global level (on the whole, creation of 30 European clusters of the global level is planned) (Communication from the commission to the council, 2010).

The development of transnational clusters and cross-cluster network is stipulated by multiple EU programs, for example, ERA-NET (support for transnational cooperation in the sphere of research and developments), PRO-INNO-EUROPE / Europe INNOVA (development of national and transborder networks, development of policy of cooperation), INNET (support for research and development in transnational clusters and networks). Another example is the European Innovation Platform for Clusters (Cluster-IP) – the platform for cooperation of clusters in the sphere of innovations – for example, in the sphere of biotechnologies or ecotechnologies. This initiative stipulates innovational development of small and medium entrepreneurship, internationalization of business, and transnational cooperation of clusters (European Innovation Platform for Clusters, 2008).

Apart from initiatives on the general European level, there are also national programs for support for transnational partnership – for example, Initiative Kompetenznetze Deutschland (Germany) and Netmatch (Denmark). The main direction of support for almost all initiatives is joint projects, aimed at R&D and implementation of innovations (around 65% of programs' budget) (Köcker & Buhl, 2007).

As the experience of the EU members shows, functioning of transborder and transnational clusters lead to the following synergic effects; increase of the scale of production and sale of goods; growth of export of goods and services; growth of inflow of foreign investments; increase of exchange of technologies; expansion of scientific and technical cooperation.

A special importance belongs to transborder and transnational clusters in the innovational sphere. Their formation stipulates: development of the system of close interrelations not only between companies of various countries, their suppliers and clients, but also knowledge institutions, among which are large research centers and universities which conduct research and developments of the international level; creation of scientific and technical products which is competitive in the foreign markets; acquiring skills of marketing research, allowing evaluating needs for new products and comparing them to the global level; creation of joint scientific centers for implementation of scientific development; intensification of scientific contacts, exchanges, and trainings; joint performance of international projects and programs. On the whole, there appear more possibilities (financial, managerial, and others) for building the whole technological chain – from joint research and development to product commercialization, including its promotion in the market.

Transnational clusters, which work mostly in the sphere of high-tech, receive additional possibilities for increase of efficiency by means of (Popkova *et al.*, 2013):

- access to various resources, including innovations, technologies, "know how", specialized services, highly-qualified staff, and financial assets;
- creation of environment of professional communication, knowledge transfer, quick distribution of information concerning innovations, new technologies, and competitive advantages;
- presence of large customer who's ready to gear up innovation within cluster structure (effect of "network externalities") and possibility of close cooperation with customer within the network for development of customized innovational decisions;
- effective specialization of each company in the network and growth of competencies in the narrow sphere of activities; possibility to use the knowledge "overflow" effect.

The advantage from formation of transnational clusters for national economy consists in expansion of international innovational and technological cooperation and use of the global practice of technologies commercialization which covers the whole innovational cycle – from fundamental research to realization of final products in the global market, including marketing of science-intensive goods and services.

4. Conclusion

As a result of the conducted research, the offered hypothesis was proved; it was also found out that economic security of modern economic systems can and should be provided by means of creation of innovational network of transnational cluster initiatives. The analysis of successful examples of creation of innovational networks of transnational cluster initiatives showed that they stipulate the increase of economic security of modern economic systems.

On the basis of the EU experience, let us make the following conclusions and offers as to development of transnational clusters (Popkova & Tinyakova, 2013b):

- creation of clusters and conduct of corresponding cluster policy in Common Economic Space should be done step-by-step, with the formation of corresponding institutional environment. Bodies, responsible for conduct of industrial and regional policy in the Customs Union, should develop a mechanism of regulatory basis for activities of business subjects within transnational clusters. Only the emergence of institutional structures can lead to development of new forms of relations between economic subjects and there will be a transition from simple forms of territorial and production relations to cooperation of business subjects within innovational and transnational clusters;
- each stage of cluster development in CES should be accompanied by certain cluster policy and corresponding regulatory base: accompanying policy corresponds to the stage of formation of industrial clusters (emphasis on industrial agglomerations); traditional policy and policy of development – stage of perfecting industrial clusters and developing regional clusters (shift of emphasis from separate spheres to the groups of interrelated spheres, cooperation of business and state); "triple spiral" policy" – stage of development of innovational and transnational clusters (close cooperation of business, science, and state);
- cluster policy should be conducted at all levels of CES countries: at the level of the Customs Union and CES, as well as at the national and regional levels. The efforts of authorities should be aimed not at support for separate enterprises but at development of the system of interrelations between economy subjects and state institutes;
- cluster policy shouldn't be isolated, independent, and strictly objective. It should include directions of certain policy (sphere of entrepreneurship and industry, science and technologies, and regional development) which

influences the development of clusters by contributing to creation of conditions of cooperation between all interested sides.

Finally, it should be noted that quicker and better results in the development of competitive transnational clusters could be received if their formation is based, on the one hand, on clever and thoroughly elaborated cluster initiatives, and, on the other hand, if formation of clusters becomes an object of purposeful activity of business, science, and state of all countries of the CES.

What is not yet solved is the problem of measuring the influence of innovational networks of transnational cluster initiatives on the level of economic security of modern economic systems, which is a perspective direction for further research in the sphere of provision of economic security.

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