ASSESSMENT OF THE REGIONAL ECONOMIC POTENTIAL FOR THE INDUSTRIAL CLUSTERS DEVELOPMENT

Prof. Dr. Svetlana Rastvortseva

Belgorod State National Research University, Russia

ABSTRACT

The aim of this study is to develop methodology for assessing the economic potential for the clusters development in the regions and to test it in the Central Black Earth Region of Russia. Four problems were solved: 1) it was determined which elements of economic potential are significant for clusters formation in the regions, 2) a system of performance assessment indicators was developed; 3) the economic potential for industrial clustering was analyzed in the Central Black Earth Region of Russia; 4) strength, weakness, opportunities and threats were identified for industrial clustering in the Central Black Earth Region of Russia. The research is supported by the grant of the RF President. Project No. 1107.2014.6

Clustering process in Russia today is spontaneous. This prevents the regions from full-scale realization of available competitive advantages. Clustering has not been given due attention or duly developed yet. Foreign cluster identification and assessment methods, cluster-based policy methods are not adapted to Russian reality. Creation of effective clusters that aid development of competitive regional economy requires methodological support, which can predetermine prerequisites of the regional economy cluster development as well as define strengths and weaknesses of clustering.

The purpose of investigation, results of which are specified in the article, is development of procedure for evaluation of economical potential for cluster development in the region. The following regions of the Russian Federation Central Black Earth Region were defined as subject of research: Belgorod, Voronezh, Kursk, Lipetsk and Tambov regions. Three objectives are assigned according to the purpose of investigation:
1) define which elements of economical potential are significant for clusters formation in the region, develop a system of performance assessment indicators;
2) analyse economical potential of clustering in the Central Black Earth Region of Russia;
3) identify strengths, weaknesses, opportunities and threats for industrial clustering in the Central Black Earth Region of Russia.

The first and the most important condition for creation of positive environment for clustering is the region's *economy development dynamics*. Moreover, it is desirable for successful functioning of clusters that fast-growing companies work in the region, since regional cluster is often considered a breakthrough business, which can provide fast economic development of the region [4]. The second component of economical potential for cluster development in the region is the region's *investment climate*. Cluster formation itself already implies significant inflow of financial assets to the region both from domestic and foreign investors.

Regional cluster must become a potential for reaching the global leadership. Thus, leadership of the European countries on the international market in some positions is provided by functioning of regional clusters. As a matter of priority the governments of the countries support global-level clusters actively integrated in the international economic relations [12]. We are of the opinion that *degree of the regional involvement in international economic relations* is a significant condition of favourable environment for clustering. Another element of the region's clustering economic potential is functioning of significant number of small and medium-sized enterprises. Importance of *small and medium-sized businesses supporting* for clusters establishment and operation in the regions is highlighted in the methodological recommendations of the Russian Cluster Observatory of cluster policies in the Russian regions [6] as well as by some scientists [2, 3].

Compulsory element of cluster development in the region is a perfect *regional infrastructure*. It includes the quality of roads, power system management, communication, railway transport, water supply and sewerage system, etc. Separate unit of clustering is *innovation infrastructure*: technoparks, business incubators, information technology centres, industrial zones, innovation and industrial complexes, innovative industrial complexes.

Effective clusters functioning in the region is possible in the terms of professional education system, which aims at meeting the needs of cluster members in specialized workforce [6]. Structure of economical activity is also significant for cluster development: successful cluster development can be reached in the sector, in which the region is the leader among other regions of the country, or in the economy sector, which is of the highest priority in the region.

Let's determine the system of indicators used for evaluation of the specified elements of the regional clustering economic potential (Table 1).

Table 1. System used for evaluation of economic potential for cluster development in the region

Region's clustering economic potential elements	Evaluation indicators
1. Region's economic development dynamics	1.1. Real GRP dynamic 1.2. Real GRP per capita dynamic
2. Investment climate	2.1. Dynamics of investment climate rating indicator (1A-3D) 2.2. Dynamics of the volume of investments in the region's capital stock
3. Degree of regional involvement in international economic relations	3.1. Dynamics of the region's share in all-Russia export volume, % 3.2. Export quote dynamics, %
4. Development of small and medium-sized enterprises	4.1. Dynamics of the number of small and medium-sized enterprises 4.2. Dynamics of turnover of the small and medium-sized enterprises
5. Development of regional infrastructure	5.1. Number of density of general-purpose hard-surface highways 5.2. Number of regional innovative infrastructure
6. Continuous education system	6.1. Number of students trained according to intermediate vocational education programs 6.2. Number of students trained according to the highest vocational education programs
7. Regional economy structure	7.1. Sectoral structure of added value

Let's analyse every clustering element according to the specified indicators. In order to exclude influence of the inflation factor let's calculate comparable indicators. For this purpose let's reduce them to 2005 year values using consumer price index of each individual region (Fig.1).
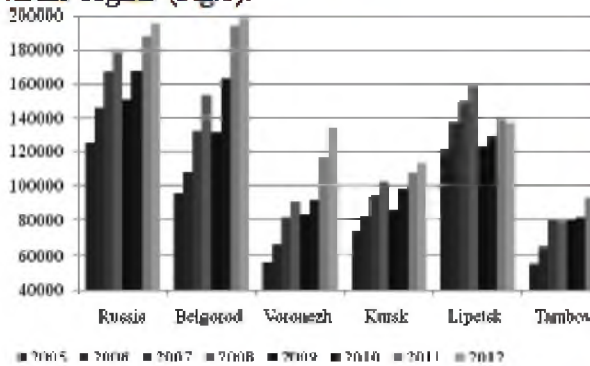

Fig.1. Dynamics of indicators of clustering economic potential element "Dynamics of economical development" (gross regional product (GRP) per capita) in the Central Black Earth Region in 2005-2012 (prices as of 2005).

Compiled according to: [9].

It should be noted that the Voronezh region is the most fast-growing one. With account of inflation the average GRP increase rate during 2005-2010 amounts to 13.69%. A significant slowdown in economic activity was noted in 2009 in all Central Black Earth regions due to the global financial crisis. The only exception is the Voronezh Region, real GRP of which in 2009 decreased only by 7.6 % and tended to increase on the current basis. It should be noted that stagnation in the Tambov region has begun already in 2008 and was still present in 2010.

Special attention should be paid to the fact that among all the regions investigated the Lipetsk and Tambov regions did not reach pre-crisis period in 2010 after allowing for inflation. This can speak for a high degree of regions' dependence on the world market environment. Therefore, operating or planned clusters must aid in mitigation of risks of the region's high dependence on the global economy changes.

It should also be noted that increase of GRP indicator per capita is slower than that of the total GRP only in the Belgorod region. This is due to increase of the total regional population. Therefore we can suppose that process of economical activity concentration is present in the region, which without doubt will promote successful development of clusters.

Two aspects of the dynamics of indicators of clustering economic potential element "Investment climate" will be analyzed: change of investment potential and investment risk as a factor component will be evaluated and dynamics of the fixed capital investment as a resulting component will be considered (Table 2).

Table 2. – Dynamics of indicators of clustering economic potential element "Investment climate' in the Central Black Earth Region in 2005-2012.

	Region	2005	2006	2007	2008	2009	2010	2011	2012
1	2	3	4	5	6	7	8	9	10
Investment Climate Index *	Belgorod	3B1	2B	3A	3B1	2B	2B1	2A	2A
	Voronezh	3B1	3B1	3C1	3B1	3B1	3A1	3B1	3A1
	Kursk	3B1	3B1	3B1	3B1	3B1	2B	3B1	3B1
	Lipetsk	3B1	3B1	3A	3A	3A	3A1	3A1	3A1
	Tambov	3B2	3B2	3B1	3B2	3B2	2B	3B1	3A1

1	2	3	4	5	6	7	8	9	10
Fixed Capital Invest-ments, mln rub	Belgorod	35022	52073	83510	104218	73127	96313	132289	136202
	Voronezh	28652	38867	65319	94168	94788	132275	152210	179990
	Kursk	17864	23241	33523	46752	41183	46093	58244	62954
	Lipetsk	30312	44565	64707	88089	84317	101600	117790	92002
	Tambov	14698	19667	30861	42701	48795	53674	65601	82571

* Rating scale:

1A	High potential - minimal risk	3A	Low potential - minimal risk
1B	High potential - moderate risk	3B1	Low potential - moderate risk
1C	High potential - high risk	3C1	Low potential - high risk
2A	Average potential - minimum risk	3B2	Limited potential - moderate risk
2B	Average potential - moderate risk	3C2	Limited potential - high risk
2C	Average potential - high risk	3D	Limited potential - extreme risk

Compiled according to: [1, 9].

Analysis of investment climate in the Central Black Earth Region showed that no region had high potential in 2005-2012. Some trends can be identified by more detailed analysis of investment potential elements. One of competitive advantages of the Belgorod region is a high level of natural-resources potential. Therefore a conclusion can be made that it is reasonable to develop the regional cluster based on the natural resources. There is metallurgical production in the region [12]. Development of the ferrous industry cluster in the region must also consider some related negative factors: complicated ecological situation in the towns Stary Oskol and Gubkin as well as mono-industrial nature of the town of Gubkin, which takes upon itself all risks related to changes of the global ferrous metals market condition. A series problem, which can hinder development of clusters, especially in the power-intensive ferrous industry sector, is electric power and water deficiency in the region.

Another kind of cluster, formation of which is related to the natural-resources potential and is expedient in the Belgorod region, is the agro-industrial cluster. At that, a "conflict of interests" existing between the extractive industry and agriculture in the region should be noted. Both kinds of activity demand vast territories, and the income level difference in the given sectors escalates the intra-regional inequality. There are no pronounced competitive advantages for formation of clusters in any particular economy sector in other four regions of the Central Black Earth Region. Strong points of development in the Voronezh region include infrastructure, labour and innovation potential. Successful overcoming of the global financial crisis by the region is due to timely creation and effective work of the anti-crisis groups as well as due to performance of anti-crisis plan.

Infrastructure potential is a strong clustering resource in the Kursk region. Natural-resources potential is a competitive advantage (but it is not so pronounced as in the Belgorod region). Due to the fact that the primary focus of the regional economy is agriculture and extractive industry, it is feasible to consider clustering potentials in these particular spheres. Development of clusters can be restricted by the water resource deficiency and black earth impoverishment in the region. During creation of clusters and maintaining their development in the Kursk region one should consider that the region is a Russian monopolist in production of polypropylene fibre, paracetamol and conveyor belt. Weak points of regional development that can hinder the clustering process are low innovative, production, financial and institutional potentials.

High infrastructure development level is a strong competitive position of the Lipetsk region in the investment potential. Other components of investment climate are at a low level, which without doubt will slow down development of clusters in the region. Foundation of the Lipetsk region economy is agriculture and metallurgical industry. Spheres of industrial activity, in which formation and development of clusters is possible, include manufacture of refrigerators and freezers, tractors and tractor-drawn cultivators, ferrous industry production, food industry. The region is a Russian monopolist in production of some types of electrotechnical steel, grinding machines and cast pressure pipes. Ecological situation is a weak point of the regional economy development.

Strong positions of the Tambov region investment potential are innovative and infrastructural components, while others are poorly developed. It is necessary to consider the available concentration of chemical industry enterprises, efficient agriculture during cluster formation and development in the region. Disadvantage of the region social and economical development is a complicated ecological situation, growth of dump areas due to agricultural lands, strong dependence of the regional economy on the global market condition.

Analysis of dynamics of indicators of the clustering economical potential element "Regional involvement in the international economical relations" in the Central Black Earth Region over the 2005 to 2012 period is shown in Table 3.

Table 3. – Dynamics of indicators of clustering economic potential element "Regional involvement in the international economical relations" in the Central Black Earth Region in 2005-2012.

		2005	2006	2007	2008	2009	2010	2011	2012
The region's share in total exports of the Russia, %	Belgorod	0,59	0,53	0,66	0,81	0,58	0,68	0,8	0,69
	Voronezh	0,26	0,25	0,27	0,21	0,22	0,23	0,26	0,32
	Kursk	0,14	0,12	0,18	0,19	0,13	0,17	0,26	0,13
	Lipetsk	1,16	1,02	1,08	1,12	0,97	0,99	0,99	0,97
	Tambov	0,02	0,02	0,02	0,02	0,02	0,01	0,01	0,02
Ratio of exports to GRP *, %	Belgorod	30,67	28,21	30,76	37,22	18,15	21,29	23,54	20,85
	Voronezh	14,57	14,20	13,55	10,66	6,75	8,36	8,85	9,33
	Kursk	12,45	10,54	15,04	16,22	7,40	10,87	17,02	8,52
	Lipetsk	60,37	53,68	57,10	63,52	40,36	49,30	52,16	54,38
	Tambov	2,50	2,18	2,53	1,94	1,19	0,81	1,13	1,61

Compiled according to: [9]

Economy of the Lipetsk region is the most export-oriented one. Its share in the all-Russia export varies from 0.97 % to 1.16 %, and export-GRP relation – from 40.36 % to 63.52 %. It should be noted that significant share of export in the Lipetsk and Belgorod regions falls on metallurgical production.

Another element of clustering economical potential is "Development of the small and medium business" (Fig.2). Development of the small and medium business must be the strong point of the regional clustering. Small and medium business in the market-based economy is the leading sector. It determines economic growth rate as well as structure and quality of GRP. Entrepreneurial business in the region maintains the niche, which will then provide wider distribution of innovations in other spheres of economy. Poorly elaborated legal framework can be related to weak points of the clustering economical potential element "Development of the small and medium business" in the Central Black Earth Region.
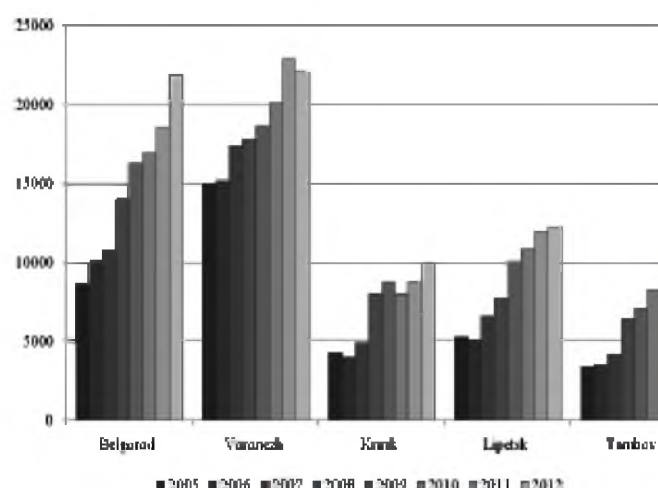
Fig. 2. Dynamics of indicator of economical potential element "Development of the small and medium business" – a number of small enterprises – in the Central Black Earth Region in 2005-2012, units

Compiled according to: [5, 7].

Another block of analysis includes indicators of the clustering economical potential element "Regional infrastructure". We analyzed dynamics of density of the general-purpose hard-surface highways in the Central Black Earth Region in 2005-2011. The highest highway density was noted in the Belgorod region (600 km per 1,000 sq. km of territory) and in the Lipetsk region (482 km per 1,000 sq. km of territory). Highway density rapidly increases in all regions.

Analysis of regional infrastructure for formation of clusters should consider the innovation component. Thirty new innovative activity organizations of the Central Black Earth Region were found in 2014 as compared to 2009. Maximum increase is observed in the operation/process group (16 new organizations) and in the expert-consulting group (6 new organizations). Maximum quantity of innovative activity organizations appeared in the Voronezh region (19) and in the Belgorod region (9).

We have analyzed the dynamics of indicator of the regional clustering economical potential element "Continuous education system" in the central Black Earth Region over the 2005-2012 period. The analysis demonstrated that increase rates of students of the post-secondary education program had negative results in all regions during the whole period, and that of higher education programs – since 2010.

We analyzed dynamics of indicators of the regional clustering economical potential element "Sectoral structure of added value" in the Central Black Earth Region. The analysis demonstrated predominance of agriculture in the Belgorod, Voronezh, Kursk and Tambov region. Extraction of commercial minerals is concentrated mainly in the Belgorod and Kursk regions. Electrical power producing capacities (including alternative power sources) shall be expanded in the Belgorod, Voronezh, Lipetsk and Tambov regions to provide the possibility for creation of new enterprises as well as development of new economical activity types. Wholesale and retail trade, repair of motor transport, household goods and personal demand items prevail in all regions, maximum indicators are observed in the Tambov region. Significant share of building industry in GRP is observed in every region, but it is most rapidly developing in the Lipetsk and Tambov region. Share of transport and communication in GRP greatly increased in the Kursk, Voronezh and Tambov region over the 2005 to 2012 period. Share of hotels and restaurants, education and health service, social services rendering is from 0.2 to 4.7 %.

Thus based on the analysis of the main elements of clustering in the Central Black Erath region we can build SWOT-analysis matrices after all strengths and weaknesses have been defined in every region (Fig.3).

Strengths (S)	Weaknesses (W)	
SO (Strengths – Opportunities)	**WO (Weaknesses – Opportunities)**	
1. High dynamics of economical development (B, V) 2. Increase of population in the region (B) 3. High infrastructure potential (B, V, K, L, T), financial potential (B), institutional potential (B) of the region 6. High dynamics of fixed capital investments (B, V), high investment potential of the region (T) 7. Development of innovations in industrial production sphere (V), high innovative potential (V) 8. High labour potential (V), high potential of continuous education system (V) 10. Efficient control of the region economical development during crisis period (V) 12. Availability of own raw material resources for development of industrial cluster (T) 13. Monopolist in particular productions: polypropylene fibre, paracetamol, conveyor belt (K), electrotechnical steel, grinding machines and cast pressure pipes (L), chemical industry (T) 14. High indicator of production and distribution of electrical power, gas and water (K) 15. Availability of special economic zone of tourist-recreation type "Elets", "Zadonshchina" (L), of industrial production type "Terbuny" (L) 16. Efficient development of industry in the sphere of manufacture of refrigerators, freezers, tractors and tractor-drawn cultivators (L)	1. Lack of electrical power (B, V, L) and water (B, K) 2. Low innovative potential of the region (B, K), absence of newly formed organizations for innovative activity (K, L, T) 3. Low touristic potential of the region (B) 4. Low potential of continuous education system (secondary and higher ones) (B, K, L) 5. Low production potential of the region (V, K) 6. Low financial potential of the region (V, K, T) 7. Low institutional potential (K, L) 8. Low transport and logistics potential (V, T, L) 9. Low level of investments attraction to the region (K)	**Opportunities (O)**
ST (Strengths – Threats)	**WT (Weaknesses – Threats)**	
1. Presence of natural-resources potential (B, K) 2. Export-oriented metallurgical production (B, L), export-oriented industrial production, high dependence on the global market situation (B, L, T) 3. Dynamic agriculture (B, V, K, L, T).	1. Presence of mono-industry towns (B, V, K, L) 2. Complicated ecological situation in the ferrous industry towns (B), impoverishment of black earth (K), complicated ecological situation in the region (L, T), increase of dump areas resulting in decreasing agricultural lands (T) 3. "Conflict of interests" between the extractive industry and agriculture (B) 4. Reduction of population in the region (V, K, L, T) 5. Low natural-resources potential of the region (V)	**Threats (T)**

Legend: B – the Belgorod region, V – the Voronezh region, K – the Kursk region, L – the Lipetsk region, T – the Tambov region

Fig.3. SWOT-analysis of economical potential of clustering for Central Black Earth Region of Russia

Thus, the tools used for evaluation of economical potential of clustering in the region include dynamism of regional economy development, investment climate, regional in-

volvement in the international economic relations, development of small and medium business, developed regional infrastructure, continuous education system, structure of regional economy as the primary elements. Particular indicators are evaluated for each element of economical potential. Results of analysis make it possible to define strengths and weaknesses, risks and opportunities as related to development of regional clusters.

REFERENCES

[1] *Investment ratings* regions of Russia: the ratings regions // Expert RA. URL: http://raexpert.ru. (Date accessed 09.04.2013)

[2] *Kolchinskaya EE, SN Rastvortseva.* Universal algorithm for identifying ways to increase the efficiency of regional inter-industry interactions in Russia (on the example of the Belgorod region) // Scientific Statement of the Belgorod State University. Series: History. Political science. Economy. Informatics, 2012. T 13 (132). Number 23/1. pp. 53-59

[3] *Kotljarova SN* The practice of forming clusters in the regions of Russia / / Regional Economics: Theory and Practice. 24 (255) - 2012. pp. 29-39

[4] *Kucenko ES* Improving the principles of cluster policy in Russia on the basis of international experience in the context implemented by the Ministry of Economic Development of the Russian Federation contest pilot regional clusters. Paper presented at the VIII International scientific-practical conference "Regions of Russia: strategies and mechanisms for modernization, innovation and technological development. May 31-June 1, 2012 Moscow

[5] *Small and medium business* in Russia. 2008, 2009, 2010, 2012, 2013: Stat. Collection / Rosstat.

[6] *Guidelines for implementing cluster policies* in the subjects of the Russian Federation. The Ministry of Economic Development of the Russian Federation. 26.12.2008 number 20636-AK/D19

[7] *About the development of small and medium enterprises* in the Russian Federation: Federal Law of July 24, 2007 № 209-FZ // Information system "Consultants +"

[8] *Rastvortseva SN* Benchmarking innovation in the management of regional efficiency // Problems of the theory and practice of management. Number 10. 2010. pp. 111-116

[9] *Regions of Russia*. Socio-economic indicators. 2011, 2012, 2013: The Stat.col / Rosstat.

[10] *Register of organizations of innovation*: the database // Research Center for Monitoring the innovation infrastructure of scientific and technological activities and regional innovation systems. URL: www.miiris.ru (10.04.2013, the date of access)

[11] *The socio-economic situation* of the Belgorod region and other regions of the Central Federal District in 2012: stat. Bull. / Rosstat, Belgorodstat. - Belgorod. – 2013

[12] *The European Cluster Memorandum*. Promotion European Innovation through Clusters: An Agenda for Policy Action. The High Level Advisory Group on Clusters. Center for Strategy and Competitiveness. 2008