

# Key Characteristics of Potential of Development of Regional Economy by Supply Chain Strategy

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**Abstract-** Article is devoted to a research of potential of development of regional economy by employing supply chain management strategy, in aspect of the analysis of productivity of live work in regions and small business, the natural and resource capacity and taxes of regions, key characteristics of potential of development of regional economies. Potential of development of regional economy is considered from positions of a ratio of number of employees of small enterprises and occupied in regional economy, from positions of quantitative characteristics of use of natural and resource potential in regional economies, in a section of export of products of the raw industries (fuel and energy complex, the chemical, forest industry, extraction of metals and metal working). The system of key characteristics of potential of development of regional economies in indicators of the occupied in economy, fixed assets, small business, consumption of energy, innovations, costs of information and communication technologies, specializations of regional economy and financial receipts in the budgetary system of the country is investigated. And also the consumer investment portfolio including consumer spending of the population, region expenses on economy, deposits to financial institutions, balanced results of activity of subjects of managing. The analytical group of regions on the potential of development of regional economies is carried out. The dependence of influence on effectiveness of economic activity not only objectively developed potential of economic development, but also subjective level of its use on the basis of the corresponding regression model according to rated data is revealed.

**Keywords** - economy development, supply chain management, regions.

## 1. Introduction

Capacity of the region is expressed not only the reached social and economic level, but also the available reserves for further development, than the urgent need of a research of aspects of formation and use of potential of development of economy of regions is caused. Potential of development

represents one of the most significant driving forces of social and economic development of regions. Management of formation and rational use of the potential of development of the region which is both a subsystem of the social and economic sphere of the region, and a subsystem of potential of development of national economy. The multilateral nature of use of potential of development of the region, predetermines need of its complex formation. Social and economic capacity of the region represents a complex of the means and all available resources involved in processes of public reproduction and social development which give the chance, at their use in further development of regions, increase in level and quality of life of the population. Dominants of development of an intensification of regional production, at the multiple-factor character, are money, specialization and fixed assets available to economy. The multiple-factor economic-mathematical analysis allows to reveal, against the background of calculation of a matrix of coefficients of correlation, the importance of elements of potential of development in formation of a gross regional product with determination of the corresponding coefficients of regression on model with absolute characteristics and elasticity on rated (to averages on regions of the Russian Federation) to indicators. Comparison of the actual characteristics of a gross regional product with indicators of potential of economic development gives the chance to carry out assessment of use of the available objective opportunities of economic activity of the explored regions.

## 2. Materials and Methods

One of basic factors economic and development is the enterprise abilities of the population which to a large extent are shown when functioning small enterprises and individual entrepreneurs. Comparative characteristics, within the available statistics of activity of MT against the background

of regional economies in general are given in table 1. Judging by statistics, the number of workers of small business, naturally, is the highest across Moscow and the Moscow region, and on other regions of Central Federal District fluctuates from 210,5 thousand people across the Voronezh region up to 47,4 – 46,4 thousand people on the Oryol and Kostroma regions. From positions of a ratio of number of employees of small enterprises and occupied in regional economy big characteristics are observed on the Ivanovo and Voronezh regions

(about 19%), at 11,6 – 10,9% on the Tambov and Kursk regions (in Moscow 16,5%). Calculation of indicators of productivity of live work (small enterprises and regions) allows to reveal the level of higher performance of live work in small business which exceeds the corresponding characteristics on the organizations of regions by 2,73 times across the Tambov region, 2,33 times across the Ivanovo region and 2,12-2,15 times on the Kostroma, Tver and Bryansk regions.

**Table1.** Productivity of live work in regions and small business of Central Federal District, 2017.

Regions	Number occupied in regions, one thousand persons.	Number of employees of small enterprises, one thousand persons.	Turnover of the organizations of the region, billion rubles.	Turnover of small enterprises, billion rubles.	Labor productivity in regions, the thousand rubles/persons.	Labor productivity in small enterprises, the thousand rubles/persons.	Labor productivity of small enterprises to the region, time
Belgorod region	757,9	108,1	2175	504	2870	4662	1,62
Bryansk region	530,2	74,1	787	237	1484	3196	2,15
Vladimir region	640,6	109,2	1127	297	1759	2717	1,54
Voronezh region	1 102,1	210,5	2412	795	2188	3776	1,73
Ivanovo region	456,3	89,3	718	328	1574	3675	2,33
Kaluga region	504,8	79,9	1545	270	3061	3375	1,10
Kostroma region	290,8	46,4	421	142	1447	3065	2,12
Kursk region	519,6	56,6	941	239	1811	4221	2,33
Lipetsk region	565,8	84,9	1353	279	2392	3287	1,37
Moscow region	3 450,2	526,9	12464	2006	3613	3808	1,05
Oryol region	321,1	47,4	486	138	1515	2903	1,92
Ryazan region	511,0	79,6	895	266	1751	3343	1,91
Smolensk region	445,9	76,4	808	273	1812	3577	1,97
Tambov region	482,4	56,0	712	226	1476	4032	2,73
Tver region	610,0	95,0	834	277	1367	2912	2,13
Tula region	719,9	109,1	1543	374	2144	3432	1,60
Yaroslavl region	621,1	85,4	1184	304	1906	3560	1,87
Moscow	8 730,0	1443,9	63014	14292	7218	9898	1,37

Author's generalization and payment under data of Rosstat [1, 2]

On other regions of Central Federal District, these characteristics fluctuate from 1,05 times across the Moscow region, 1,37 times across Moscow and the Lipetsk region, 1,54 – 1,60 times on the Vladimir and Tula regions. It speaks, apparently, not only the fact that the private property is more effective and competitive, but also that circumstance that in small

business it is not accepted to steal from himself somehow. On regions of Central Federal District as shows the analysis of data of table 2, a significant role have, at essential distinctions on the studied regions, also characteristics of natural and resource potential.

**Table 2.** Natural and resource potential and taxes of regions of the CFD, 2017.

Regions	Ranks	Export, one million dollars					Export of natural resources in their total exports of the country, %	Taxes and payments of regions in the budgetary system of the Russian Federation, %
		Products of energy industry	Chemical products	Wood and woodworking	Metals and metal working	Natural resources, all		
Belgorod region	81	20	51	11	1 800	1 882	0,66	0,5
Bryansk region	17	24	24	43	29	119	0,04	0,3
Vladimir region	18	3	121	78	18	219	0,08	0,4
Voronezh region	36	6	702	11	22	740	0,26	0,6
Ivanovo region	5	0	38	10	9	57	0,02	0,2
Kaluga region	16	209	66	45	428	747	0,26	0,5
Kostroma region	15	0	7	182	17	206	0,07	0,1
Kursk region	64	-	80	9	50	139	0,05	0,3
Lipetsk region	13	40	13	5	3 959	4 017	1,41	0,3
Moscow region	35	229	972	234	598	2 033	0,71	4,8
Oryol region	11	-	2	0	16	19	0,01	0,1
Ryazan region	29	29	36	14	38	117	0,04	0,6
Smolensk region	14	2	385	106	81	575	0,20	0,3
Tambov region	23	-	46	0	0	47	0,02	0,2
Tver region	26	5	18	52	30	105	0,04	0,4
Tula region	21	8	922	25	772	1 726	0,61	0,4
Yaroslavl region	7	36	311	32	15	394	0,14	0,8
Moscow	2	123702	2980	547	1 542	128770	45,20	17,7

Author's generalization and payment under data of Rosstat [2, 3, 4]

Ranks of natural and resource potential in the ranged row from the worst to the best, judging by data of «The rating [3] of investment attractiveness of regions of Russia», fluctuate from 81 across the Belgorod region and 64 across Kursk region up to 2 across Moscow and 5 across the Ivanovo region.

Except for Moscow (which is not extracting, but selling 45,2% of natural resources of the country), export of natural resources makes on other regions of the CFD from 4 billion dollars across the Lipetsk region, 2 billion dollars across the Moscow region, 1,9 billion dollars across the Belgorod region to 19 million dollars across the Oryol region. The essential share of financial receipts in all levels of the budgetary system of the Russian Federation, including, in federal, is listed by the Moscow region (4,8%) whereas on other regions the specific weight of receipts in the federal budget fluctuates from 0,8% across the Yaroslavl region up to 0,1% on Oryol [5-8]. Rated characteristics of key indicators, demonstrate significant relative differences between

regions. Except for Moscow and the Moscow region level occupied in economy differs from 95 points across the Ryazan region up to 105 points on Kaluga, material and technical resources volume from 19 across the Kostroma region up to 80 points on Voronezh, the consumer investment portfolio from 20 points across the Kostroma region up to 122 points on Voronezh, turnover of small enterprises from 24 points across the Oryol region up to 139 points on Voronezh, the used conditional fuel from 28 across the Kostroma region up to 158 points on the Lipetsk, innovative products from 0,4 points across the Ivanovo region up to 206 points on Belgorod, natural resource to potential from 12 points across the Ivanovo region up to 188 points on Belgorod, specializations of regional economy from 69 points across the Ivanovo region up to 128 points on Belgorod, to expenses on and information and communication technologies from 10 points across the Oryol region up to 66 points on Kaluga, to financial receipts in the budgetary system in the

Russian Federation from 8 points on the Kostroma and Oryol regions up to 68 on Yaroslavl [9- 12]. The total system of key characteristics of potential

of development of regional economies of Central Federal District is given in table 3.

**Table3.**Key characteristics of potential of development of regional economies of the CFD, 2017.

Regions	Number occupied, one thousand persons.	Fixed assets, billion rubles.	Consumer investment portfolio of billion rubles.	Turnover of small enterprises, billion rubles.	Conditional fuel, thousand tons	Innovative products, million rubles.	Export of natural resources, one million dale.	Integrated indicator of specialization, points	Costs of ICT, million rubles.	Taxes and payments per. in the Russian Federation, %
Belgorod region	757,9	1502	851	504	12923	101170	1882	117,3	4209	0,5
Bryansk region	530,2	795	453	237	5535	12199	119	90,1	4740	0,3
Vladimir region	640,6	842	514	297	6506	34030	219	102	4024	0,4
Voronezh region	1102	1842	1198	795	9589	32482	740	83,7	4980	0,6
Ivanovo region	456,3	551	308	328	3107	219	57	69,2	1784	0,2
Kaluga region	504,8	990	473	270	5422	16574	747	109,9	11472	0,5
Kostroma region	290,8	437	195	142	2823	14591	206	82,2	2004	0,1
Kursk region	519,6	878	486	239	6940	30361	139	110,4	2589	0,3
Lipetsk region	565,8	1268	687	279	17539	63108	4017	128,8	3888	0,3
Moscow region	3450	8044	4794	2006	33153	384329	2033	73,2	116401	4,8
Oryol region	321,1	496	273	138	3912	1429	19	94	1751	0,1
Ryazan region	511	1011	422	266	8162	19887	117	94,4	3279	0,6
Smolensk region	445,9	858	347	273	4545	10138	575	87,7	2419	0,3
Tambov region	482,4	844	448	226	3798	12963	47	98,1	2095	0,2
Tver region	610	1250	477	277	9354	10054	105	75,2	3579	0,4
Tula region	719,9	1117	659	374	10713	80875	1 726	109,6	5348	0,4
Yaroslavl region	621,1	1311	534	304	9389	46558	394	85,9	5333	0,8
Moscow	8730	36605	16235	14292	47994	248999	128 770	68,1	781272	17,7

Author's generalization and payment under data of Rosstat

Respectively, big rated characteristics of a gross regional product are observed across the Voronezh region (103 points) and also Belgorod (88 points), Tula (63 points), Lipetsk and Yaroslavl (57 points) whereas these indicators are across the Kostroma region 19 points, Ivanovskaya 22 points, the Oryol 24 points [13-15].

With positions of pair coefficients of correlation, all elements of potential have significant effect on a

gross regional product, being located on characteristics of narrowness of communication in the following ranged order: consumer инвестиционный a portfolio, receipt of taxes and payments in the budgetary system of the country, production specialization, economy material and technical resources, turnover of small enterprises, natural and resource potential, costs of information and communication technologies, employment in

economy, the consumed conditional fuel, volume of innovative products [16].

**Table 4.** Group of regions of the CFD on the potential of development, 2017.

Indicators	Groups of regions, billion rubles.			
	To 60	60-80	over 80	Moscow
Potential of development, billion rubles.	46	67	189	1752
Number occupied, one thousand persons.	421	590	1469	8730
Fixed assets, billion rubles.	663	1057	3164	36605
Consumer investment portfolio, billion rubles.	337	509	1883	16235
Turnover of small enterprises, billion rubles.	224	289	896	14292
Conditional fuel, thousand tons	3953	8069	18301	47994
Innovative products, one million rub	8590	34049	145272	248999
Integrated indicator of specialization, points	87	98	101	68
Costs of information and communication technologies, million rubles.	2465	5089	32370	781272
Natural and resource potential, ranks	14	26	41	2
Share of regions in taxes of the Russian Federation, %	0,2	0,5	1,6	17,7
Gross regional product, billion rubles.	247	430	1524	15285

Авторские расчеты по данным Росстата

Calculations on the basis of the received characteristics of elasticity allowed to carry out integrated assessment of potential of development of regional economies of Central Federal District. The corresponding estimates fluctuate from 1752 points across Moscow, 454,5 points across the Moscow region, 118,5 points across the Voronezh region and 102,4 across the Belgorod region up to 79,1 and 80,9 points on the Tula and Lipetsk regions, 71 point across the Yaroslavl region, 61,4-65,9 points on the Tver, Ryazan, Vladimirovsky, Kaluga and Kursk regions, 50,5-56,3 points on the Smolensk, Tambov and Bryansk regions, 39,3 and 42,6 Oryol and Ivanovo regions, 34 points across the Kostroma region. Communication of potential of development with results of economic activity of regions is shown clearly by these tables 4 in which the analytical group of regions of Central Federal District on the potential of development of regional economies is given [17]. In the first group six regions with a low potential, in the second – seven regions with an average potential are concentrated. The third group includes 4 regions with rather high potential. Moscow with the highest development potential in the country is separately allocated. Apparently, from the carried-out calculations, increase in characteristics of potential of development of regional economies of the CFD from 46 points on average in regions of the first group of 67 points on regions of the second group and 189 points in the third group, (at 1752 points across Moscow) is followed by the consecutive

growth of almost all elements of potential and leads to increase in a gross regional product. Attracts attention the fact that levels of use of the available objective conditions of economic activity on groups of regions not only are various, but also continuously raise in process of increase in characteristics of potential of development. If in the first group with the lowest potential it is used only for 60,4%, in the second – for 72,6%, in the third – for 91,4%, then across Moscow this characteristic approaches 100%. Thus, the effectiveness of economic activity is affected as a result by not only objectively developed potential of economic development, but also subjective level of its use what the corresponding regression model according to rated data shows clearly:

$$Y = -27,4 + 0,994P + 0,145Z; R = 0,999; D = 0,998; F = 28256,$$

Where Y – a gross regional product, points

P – Potential of development of regional economy, points

Z – Use of potential of development, points.

Simple calculations allowed to reveal that in general on regions of Central Federal District the dominating role in formation of a gross regional product has the development potential (87,3%) whereas 12,7% of a variation of productive sign are defined by influence of a subjective factor [18]. At the same time, on the analyzed territorial subjects of the federation the share of a subjective factor in formation of gross regional product sharply differs from 1,1% across Moscow and 4,2% across the

Moscow region up to 20% across the Smolensk region, 24,4% across the Oryol region and 25,4% across the Kostroma region (on other regions its specific weight fluctuates from 13% across the Voronezh region up to 19,8% across the Tambov region). In Central Federal District 4 groups of regions are allocated [19, 20]. In the first group there are Moscow and the Moscow region, with rather big efficiency of the available objective opportunities (98,9 and 97,7%). The second group of regions includes the Voronezh, Belgorod and Yaroslavl regions, with assessment of use of potential of development from 80% to 90%. The third group of regions is presented by the Tula, Vladimirovsky, Kaluga and Lipetsk regions with efficiency of the available objective opportunities from 70 to 80%. Low characteristics of use of potential of development (with assessment from 60 to 70%) are inherent in other regions, except for the Kostroma and Ivanovo regions with the corresponding estimates at the level of 56,8 and 51%. Calculations showed that the most part of key indicators has the best average characteristics in the second group of regions with the best potential of development: number occupied in economy is 1,59 times higher, fixed assets by 2,44 time, than turnover of small enterprises by 3,67 times, costs of innovative and communication technologies by 4,73 time, the volume of the consumer investment portfolio by 2,09 times. Slightly lower in the second group average volumes of innovative products, but the most important is the fact that at large average volumes of a gross regional product in the second group (by 2, 41 times) consumption of conditional fuel on groups of regions is almost identical (11128 thousand tons on average in regions of the first group and 11238 thousand tons in the second group). In these conditions, the high concentration and intensity of economic activity and also smaller power consumption of production are the main reasons of high efficiency of functioning of regions of the second group. Simple calculations show that the power consumption of production on average in regions of the second group is 5,8 kg of conditional fuel per one million rubles of a gross regional product whereas on average in regions of the first group the power consumption of production is at the level of 13,8 kg/million rubles (2,38 times more).

### 3. Results and Discussion

One of basic factors economic and development is the enterprise abilities of the population which to a large extent are shown when functioning small enterprises and individual entrepreneurs.

Calculation of indicators of productivity of live work (small enterprises and regions) allowed to reveal the existing feature (in essence regularity) which essence in significantly higher performance of live work in small business which exceeds the corresponding characteristics on other organizations of the explored regions [21].

Quantitative characteristics of use of natural and resource potential in regional economies are indicators of export of products of the raw industries (fuel and energy complex, the chemical, forest industry, extraction of metals and metal working). The huge volumes of export of natural resources which are fixed statistics on Moscow speak simply – many large «players» of commodity market have jurisdiction in the capital with corresponding characteristics of export of natural resources which share makes 45,2% of total exports of natural resources here in the country whereas on other regions of Central Federal District corresponding specific weight fluctuate from 1,41% across the Lipetsk region, 0,66% across the Belgorod region and 0,61% across Tula region, up to 0,01 – 0,02% on the Oryol, Ivanovo and Tambov regions. With export of natural resources and other characteristics of potential of development the taxes, collecting and other obligatory payments coming from regions to the budgetary system of the Russian Federation correlate. Here, in connection with the specified ninth feature, Moscow transferring in the budgetary system of the Russian Federation 17,7% of the corresponding receipts [2] is sharply allocated. The total system of key characteristics of potential of development of regional economies of Central Federal District includes indicators of the occupied in economy, fixed assets, small business, energy consumption (conditional fuel, one thousand tons), innovations (the corresponding products, million rubles), expenses on information and communication technologies, the natural and resource potential, specialization of regional economy and financial receipts in the budgetary system of the country and also the consumer investment portfolio including consumer spending of the population, region expenses on economy, deposits to financial institutions, balanced results of activity of subjects

of managing. The made calculations showed that along with absolute characteristics, on regions characteristics of wear of fixed assets considerably differ. One more feature of development of regions of Central Federal District, the fact that in dynamics, the level of wear of material and technical resources not only does not decrease is, but even increases. And by the overwhelming number of regions also specific weight of completely worn-out fixed assets increases in dynamics. The following feature of development of regions of Central Federal District is that the carried-out comparative analysis of key characteristics of potential of development and a gross regional product, showed their close interrelation. Regions with the best objective opportunities make, respectively, large volumes of goods and services whereas in territorial subjects of the federation with the worst potential volumes of gross regional product are lower. Comparison of the actual characteristics of a gross regional product with indicators of potential of economic development allowed to carry out assessment of use of the available objective opportunities (with other things being equal) of economic activity of the studied territorial subjects of the federation in the system of all regions of the country.

#### 4. Conclusion

Thus, the matrix of coefficients of correlation, interrelation of a gross regional product with key indicators of potential of development and also various factorial characteristics among themselves allows drawing a number of important conclusions based on the supply chain management. It includes, at the choice of the best indicators in the system of private estimates of natural and economic potential and specialization of regional economy. From positions of pair coefficients of correlation, all elements of potential have significant effect on a gross regional product.

From here an important conclusion about multiple-factor character carried out in the analyzed territorial subjects of the federation of an intensification of regional production with the observed development dominants which, first of all, money available to economy, specialization and fixed assets are appears. At the same time, between concrete elements of potential of development are also observed various, often essential, characteristics of narrowness of communications, than need of calculation of multiple-factor models

of dependence of a gross regional product on the analyzed production factors is defined. The multiple-factor economic-mathematical analysis which is carried out on regions of the country allowed to reveal, against the background of calculation of a matrix of coefficients of correlation, the importance of elements of potential of development in formation of a gross regional product with determination of the corresponding coefficients of regression on model with absolute characteristics and elasticity on rated (to averages on regions of the Russian Federation to indicators). The obtained data allow to judge economic return of each of the development potential elements included in multiple-factor model. Judging by elasticity coefficients one percent of gain of fixed assets allows to increase a gross regional product by 0,12%, gain of gross regional product from one percent of the consumer investment portfolio is equal to 0,527%, increase in innovative products by 1 percent leads to growth of gross regional product by 0,013%, and with growth by 1 percent of specific weight of receipts of taxes and payments in the budgetary system of the country gross regional product increases by 0,139%. Growth of employment of the population in regions for 1 percent leads to increase in gross regional product by 0,033%. And the payback of one percent of a turnover of small enterprises is 0,112%. Each % of conditional fuel gives return in 0,023%, per 1 percent of improvement of specialization of production gain of gross regional product is 0,137%, the payback of 1% of costs of information and communication technologies reaches 0,038%, and change of a natural and resource component for 1%, causes gain of GROSS REGIONAL PRODUCT of 0,039%. Increase in characteristics of potential of development of regional economies is followed by the consecutive growth of almost all elements of potential and leads to increase in a gross regional product. It demonstrates, first, to influence of potential of development on results of economic activity of the analyzed territorial subjects of the federation, and secondly, to the multiple-factor nature of the carried-out intensification of regional production.

Very high coefficients of correlation and determination and also Fischer's criterion confirms close connection of productive sign with the analyzed factors, adequacy to the received economic-mathematical model of reality.

Judging by regression coefficients with increase in potential of development by one ruble gross regional product increases by 0.996 rubles, and change of level of use of the available objective opportunities for 1% leads to adequate change of gross regional product on 1795 million rubles. Sorting of key indicators of the analyzed territorial subjects of the federation according to use of potential of development in groups, allowed to reveal, than it is generally possible to explain the observed differences in functioning of regional economies.

The difference between actual and settlement (on potential) characteristics of a gross regional product testifies to advantages and the closest reserves of development of regional economies of Central Federal District if the Kostroma and Belgorod regions received, due to the best use of the available objective opportunities, in addition 36,6 and 61,8 billion end economic result, then unused opportunities on a number of regions fluctuate from 1.8 billion rubles across Kursk region of 17,3 and 18,6 billion rubles on Smolensk and Tambov up to 86,4 billion rubles across the Lipetsk region.

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