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ECONOMIC GROWTH OF THE RUSSIAN INDUSTRIAL REGIONS: THE URALS CASE STUDY

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Abstract

Current economic growth indicators in Russian regions show a significant decline, zero growth, and even negative dynamics. This trend concerns the Urals as well. The author models economic growth drivers for the Urals' regions within the Urals Federal District and the Urals Macro-region. Seven regions of the Russian Federation are included in the research. They are: Kurgan Region, Orenburg Region, Sverdlovsk Region, Tyumen Region, Chelyabinsk Region, Bashkortostan Republic, Udmurtiya, and Perm Territory. The study is based on neoclassical economics' methodological issues, which implies dependency of the output volume on the applied factors of production within the production function. Applying neoclassical methodology and using economic instruments, the author conducts quantitative research and builds several regression models. A multiplicative modified Cobb-Douglas function is built for every region involved in the research. The variables for this function include five factors: industrial production growth rate, employment growth rate, fixed asset investment growth rate, fixed capital growth rate, and per capita income growth rate. Regional Gross Domestic Product growth rate serves as a resultant variable. According to the developed econometric models, the author concludes the most resilient parameters of the equations, consequently determining the most significant factors that affect economic growth in every region involved.

Keywords: Econometric modelling, modified Cobb-Douglas multiplicative function, region's economic growth, regression analysis, the Ural Federal District, the Ural Macro-region

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1. Introduction

In the past decade, the issue of economic growth had been among the most rated problems of the researches. With the beginning of the so-called “pandemic reality”, this problem nowadays is undoubtedly on the top on the macro-level and on the regional level. The “post-pandemic future” sooner or later will require a new start for economic growth which will launch transitional mechanisms, but how exactly the mechanisms will work, what the key elements are, which of them will determine the future tendencies of new economic growth – these issues remain to be discovered.

The article covers the Urals' economies within the Urals Federal District and within the Urals Macro-region, which lets the author make more accurate quantitative analysis of homogeneity or heterogeneity of the factors affecting economic growth. The study involves eight entities of the Russian Federation: Kurgan Region, Orenburg Region, Sverdlovsk Region, Tyumen Region, Chelyabinsk Region, Bashkortostan Republic, Udmurtiya, and Perm Territory.

1.1. The special character of the Urals Federal District

Since 2000, according to a Presidential Decree, Russia is divided into Federal Districts. Kurgan Region, Sverdlovsk Region, Tyumen Region, and Chelyabinsk Region are under the authority of The Urals Federal District (the UrFD).

In current figures, the UrFD today is 13.51% of the Regional Gross Domestic Product, 10.62% of Russia’s territory, 35.43% of taxes and income to Russian budget even though the share of the population is 8%, and the share of employed is approximately 9%.

Mechanical engineering and metalworking (19%) and fuel industry (12%) dominated the region's industrial structure for the period 1995 – 2004. The situation has not changed critically since 2010. However, a trend is evident in the heavy industry's growth and fuel industry, along with the decline of machinery.

Since Peter the First period, the Urals had become the industrial center of Russia, remained it during the USSR period, and probably will retain this status for a long time. Analysis of industrial production share in the structure of gross value added demonstrates 55.5% by the end of 2017. In the past decade, industrial production tends to decline, which is typical for almost all Russian regions. Only Far Eastern Federal District demonstrates a tendency to industrial growth with 27.9% in 2005, and 38.2% in 2017. Share of industrial production in the UrFD had increased again from 52.4% to 55.5% for the period 2016 – 2017. In any case, the Urals Federal District has been leading industrial production share since 2005 (56.7%). However, the Urals cannot be identified as industrially homogeneous. The ratio of the UrFD regions’ industrial share is demonstrated in Table 1.

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Table 1. Sectoral regional structure of gross value added in the UrFD, percentage of the total, 2017

Region	Types of economic activity				
	Mineral extraction	**Manufacturing**	**Provision of electricity, gas and steam; air conditioning**	**Water supply and Drainage, waste management, treatment of the pollution**	**Total share of industrial production**
Russia	12.1	17.4	3.3	0.6	33.4
The Urals Federal District	38.2	13.8	3.0	0.5	55.5
Kurgan Region	0.9	21.2	7.5	0.8	30.4
Sverdlovsk Region	1.5	31.0	4.4	0.9	37.8
Tyumen Region	57.4	4.2	2.3	0.3	64.2
Including Khanty-Mansiysk Autonomous Region	67.1	2.4	2.7	0.3	72.5
Including Yamal-Nenets Autonomous Region	61.1	1.6	1.5	0.1	64.3
Chelyabinsk Region	2.1	35.3	4.1	1.1	42.6

Source: Rosstat data. https://gks.ru/bgd/regl/b19_14p/Main.htm

Figures in Table 1 are relevant at the end of 2017. As for dynamics, the industrial production rate demonstrates a decline over the last 15 years, which is typical for the whole Federal District and every region separately. Only Kurgan region shows a significant increase (23.6% in 2005, 30.4% in 2017).

Table 2 gives the General characteristics of the Urals and its regions.

Table 2. Regional characteristics of the Urals Federal District compared to the same indicators of the whole District at the end of 2017 [a.]

№	Indicators	The Urals Federal District		Regions (% of the total in the UrFD)			
		Absolute values	**% of the total in Russia**	**Kurgan Region**	**Sverdlovsk Region**	**Tyumen Region**	**Chelyabinsk Region**

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1	Land area, thousands of square kilometers		1,818.50	10.62	3.93	10.68	80.52	4.87
2	Population, thousands of people		12,356.20	8.41	6.84	35.01	29.88	28.27
3	Average annual employment rate, thousands of people		6,366.70	8.86	5.32	32.48	34.98	27.22
4	Per capita income, rubles per month		32,944.00	1.05	0.63	1.07	1.28	0.71
5	Per capita consumer spending, rubles per month		24,123.00	1.01	0.59	1.21	1.15	0.67
6	Average monthly salary of staff, rubles per month		43,977.00	1.12	0.58	0.79	1.45	0.73
7	Regional Gross Domestic Product, millions of rubles		9,354,739.30	13.51	2.07	21.14	63.31	13.48
8	Fixed asset investment, millions of rubles		2,870,072.00	17.98	0.78	11.77	80.66	6.79
9	Capital assets in economics (according to full book value), millions of rubles		35,953,434.00	18.47	2.02	17.18	72.32	8.48
10	The volume of domestic production goods sold, services rendered by the types of economic activities, millions of rubles	Mineral extraction	5,202,482.00	37.38	0.06	1.29	97.43	1.22
11		Manufacturing	4,760,492.00	12.29	2.03	36.43	32.95	28.59
12		Provision of electricity, gas and steam; air conditioning	712,098.00	13.24	2.88	33.10	44.78	19.24
13		Water supply and Drainage, waste management, Treatment of Pollution	142,211.00	13.91	2.01	42.42	31.50	24.07
14	Agricultural products, millions of rubles, including		323,585.70	6.32	11.97	24.46	24.55	39.03
15	Crop production		136,067.80	5.21	17.35	21.13	26.25	35.27
16	Livestock		187,517.90	7.47	8.07	26.87	23.32	41.75
17	Opening of housing units, thousands of square meters		6,301.70	7.95	4.31	34.02	39.17	22.49

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18	Retail trade turnover, millions of rubles	2,555,718.40	8.57	4.25	42.19	34.29	19.27
19	Taxes and fees revenues to the federal budget, %	3,246,332.70	0.35	0.28	2.96	94.34	2.42

[a] Lines 4-5 contain quotient of the regional values and the same indicators in the UrFD.

Source: Calculations of the author with data provided by Rosstat https://gks.ru/bgd/regl/b19_14p/Main.htm

According to Table 2 the vast majority of the UrFD land area (80%) is located in Tyumen Region. At the same time, 43.8% of this territory is Yamal-Nenets Autonomous Region (YNAR), and 29.4% - Khanty-Mansiysk Autonomous Region (KMAR). Sverdlovsk Region dominates in population share; Chelyabinsk and Tyumen Regions are equally inhabited (3,692.4 and 3,493.0 thousand of people respectively), although Chelyabinsk Region has only 5% of the UrFD land area.

1.2. The special character of the Urals Macro-Region

Tyumen Region is geared towards raw materials, while Chelyabinsk and Sverdlovsk Regions are industrially-oriented. The extractive industry's share in the gross value structure added in Tyumen Region is 57.4% (KMAR – 67.1%, YNAR – 61.1%). Formation of the Urals District by regional administrative subdivision demonstrates the state policy's effectiveness in the sphere of industrialization. According to Lavrikova et al. (2019), the Urals Federal District includes all the types of regions: the Chelyabinsk Region is characterized as industrial type, Sverdlovsk Region – trade-industrial type, Kurgan Region – agricultural-industrial type, Tyumen Region – energy and raw materials type. As a result, the Tyumen Region's orientation on the raw material misrepresents common trends in the Urals within the Federal District. In this connection, researchers more often study the economy of Urals within the Urals Macro-region, involving Chelyabinsk Region, Sverdlovsk Region, Bashkortostan Republic, Udmurtiya, Orenburg Region, Kurgan Region, and Perm Territory.

Sectoral regional structure of gross value added within the Urals Macro-Region is demonstrated in Table 3.

Table 3. Sectoral regional structure of gross value added within the Urals Macro-Region, percentage of total, 2017

Region	Types of economic activity				
	Mineral extraction	**Manufacturing**	**Provision of electricity, gas and steam; air conditioning**	**Water supply and Drainage, waste management, treatment of the pollution**	**The total share of industrial production**
Kurgan Region	0.9	21.2	7.5	0.8	30.4
Bashkortostan Republic	3.5	28.3	2.9	0.9	35.6

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Sverdlovsk Region	1.5	31.0	4.4	0.9	37.8
Chelyabinsk Region	2.1	35.3	4.1	1.1	42.6
Udmurtiya	24.5	20.5	2.4	0.5	47.9
Perm Territory	18.8	31.4	2.8	0.9	53.9
Orenburg Region	36.0	13.4	3.5	0.6	53.5

Despite common trends in Chelyabinsk and Sverdlovsk Regions, unevenness of development trends in comparison with Tyumen Region is obvious. It's impossible not to notice how development tendencies in Tyumen and Kurgan Regions are not in line with the common trends within The Urals Federal District. According to Rosstat, industrial production share in the gross value structure added by the end of 2017 was 55.5%. This indicator was majorly provided by Tyumen Region with 64.2%, while Kurgan, Sverdlovsk, and Chelyabinsk Regions demonstrated only 30.4-42.6%.

2. Problem Statement

Many Russian regions can be characterized as industrially oriented, but what indicators must be used to specify a particular region as industrial? Every researcher has a different approach. For instance, some authors propose an indicator of industrial production share in Regional Gross Domestic Product. Exceeding the target of 30% identifies regions as industrially oriented, which means that all the regions within the Urals Federal District and the Urals Macro-Region can be categorized as industrial.

Industrial production and the agricultural sector tend to decline around the world, replaced by the services sector. For example, among all the European countries, only Germany managed to maintain its industrial core with an industrial production share of 22.4-30.5% (Tatarkin et al., 2014). Even China demonstrates services sector growth, although most of its provinces remain industrially oriented, and it is the industrial sector that provides regional development of China (Liu et al., 2020).

Every country, including Russia, undoubtedly has its own economic development features, which causes unevenness and inequality in regional development. For example, rapid economic growth in India had led to increased regional inequality since 1991. However, some authors claim that India has rural areas that grow faster than urban areas (Chandaa & Kabirajb, 2020), proving convergence and denying regional inequality. Unevenness of regional development is also typical for Croatia (Marošević, 2020). Simultaneously, growth factors for central regions and small provinces of Canada differ significantly with varying elasticity. Labour and investment remain the key factors of development (Chernis et al., 2020).

In previous articles, the author conducted a similar study (Barkhatov and Benz, 2019) covering extractive industries and manufacturing in the Urals Federal District. Simulation of different functions resulted in selecting specified variables because other variables (credit for fixed capital investment growth rate and expenditure on technical innovation growth rate) did not lead to any significant empirical results. Moreover, in previous publications, the author did not use such variables as the growth rate of fixed assets

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cost and employment growth rate in quantitative models. Fixed capital investment growth rate and labour force growth rates were used instead.

In this research, the variable “labour force growth rate” is replaced by the "number of employed persons". Another variable, "growth rate of fixed capital investment," is complemented by obvious “fixed assets”. And furthermore, the population's income plays a meaningful role for every other Russian region despite its industrial type. With all information mentioned above specification of function (1) is explained. The function can be found further in “Research Methods”.

Many scientists worked on features of production function application. Knoblach and Stöckl (2020) made a proper review of these studies. In this research, the production function is used in order to explore the regional growth rate. The function we use is modified as we operate with a growth rate instead of absolute values. Along with indicators of labor and capital, other variables are implemented, for instance, industrial production growth rate, and per capita income growth rate, that is why the function is also multiplicative.

3. Research Questions

Working hypotheses of the research:

- the economic growth of any region is determined by industrial production growth rate, employment growth rate, fixed capital investment growth rate, fixed assets growth rate, per capita income growth rate;
- the industrial production growth rate is the most elastic factor of regional economic growth;
- the growth rate of per capita income is the second most important factor of regional development;
- key factors for every region are different;

The significance of the factors researched is typical for all the regions.

4. Purpose of the Study

The purpose of the study is to identify specific factors of economic growth for the regions of the Urals

5. Research Methods

The author uses econometric methodology. Regressions illustrating functional dependence of economic growth on its factors are run for all the regions involved.

The author created the model below to identify factors of economic growth specific for every region.

$$Y = A \cdot X_1^{\alpha} \cdot X_2^{\beta} \cdot X_3^{\gamma} \cdot X_4^{\delta} \cdot X_5^{\lambda} \qquad (1)$$

for

Y – growth rate of nominal Regional Gross Domestic Product (in current prices),

X_1 – industrial production growth rate,

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X_2 – annual average number of employed persons growth rate,

X_3 – growth rate of fixed capital investment,

X_4 – growth rate of fixed assets cost,

X_5 – growth rate of per capita income,

$A, \alpha, \beta, \gamma, \delta, \lambda$ – parameters of the function.

Function (1) is in fact a modified Cobb-Douglas Multiplicative Function which originally was:

$$Q = A \cdot L^{\alpha} \cdot K^{\beta} \quad (2)$$

Q – volume of production, L – volume of labour, K – volume of capital, A, α, β – parameters of the function (Cobb & Douglas, 1928).

6. Findings

Function (1) was built for every region. The application of function linearization using natural logarithms let the author build an interim linear function. Source data was provided by Rosstat. The sampling covers the period 1995-2017. Every model required 22 observations.

Для удобства восприятия данных, приведенных в таблице 4, присвоим каждому региону свой номер:

Kurgan Region – 1, Orenburg Region – 2, Sverdlovsk Region – 3, Tyumen Region – 4, Chelyabinsk Region – 5, Bashkortostan Republic – 6, Udmurtiya – 7, Perm Territory – 8.

Descriptive statistics of observed variables used for construction of multiple linear function is demonstrated in Table 4.

Table 4. Descriptive statistics of observed variables used for construction of function below

$$\ln(Y) = \ln(A) + \alpha \cdot \ln(X_1) + \beta \cdot \ln(X_2) + \gamma \cdot \ln(X_3) + \delta \cdot \ln(X_4) + \lambda \cdot \ln(X_5)$$

for every region involved

Variable	Quantity of observations	Number of region	Average value	Standard error	Minimal value	Maximum value
Natural logarithm of Regional Gross Domestic Product growth rate	22	1	0.157	0.029 [a]	0.014	0.44
		2	0.173	0.035 [a]	-0.039	0.645
		3	0.164	0.026 [a]	-0.135	0.432
		4	0.189	0.037 [a]	-0.091	0.585
		5	0.168	0.026 [a]	-0.178	0.580
		6	0.162	0.057 [a]	-0.137	0.552

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		7	0.172	0.042 [a]	-0.051	0.617
		8	0.158	0.032 [a]	-0.118	0.525
		1	0.013	0.153	-0.221	0.124
		2	0.024	0.377	-0.116	0.156
		3	0.03	0.243	-0.2	0.16
Natural logarithm of industrial production growth rate	22	4	0.021	0.692	-0.04	0.102
		5	0.021	0.324	-0.221	0.148
		6	0.04	0.693	-0.062	0.131
		7	0.023	0.314	-0.151	0.174
		8	0.036	0.288	-0.103	0.167
		1	-0.012	0.52	-0.069	0.087
		2	-0.004	0.711	-0.107	0.072
		3	0.0007	1.029	-0.027	0.054
Natural logarithm of annual average number of employed persons growth rate	22	4	0.012	0.734	-0.036	0.117
		5	0.005	1.286	-0.032	0.052
		6	-0.0005	1.469	-0.033	0.045
		7	-0.0009	1.465	-0.027	0.061
		8	-0.008	0.854	-0.053	0.039
Natural logarithm of fixed capital	22	1	0.139	0.062	-0.267	0.563

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investment growth rate		2	0.172	0.153	-0.176	0.536
		3	0.168	0.139	-0.187	0.416
		4	0.190	0.167	-0.308	0.864
		5	0.162	0.139	-0.27	0.572
		6	0.158	0.128	-0.318	0.714
		7	0.160	0.088	-0.318	0.684
		8	0.174	0.122	-0.141	0.673
Natural logarithm of fixed assets cost growth rate	22	1	0.142	0.064	-0.015	0.975
		2	0.151	0.137	-0.113	1.007
		3	0.159	0.085	0.007	0.003
		4	0.185	0.147	-0.144	0.646
		5	0.146	0.103	0.042	0.853
		6	0.142	0.127	-0.027	0.99
		7	0.151	0.123	0.034	1.03
		8	0.155	0.118	-0.004	0.854
Natural logarithm of per capita income growth rate	22	1	0.197	0.126	-0.006	0.552
		2	0.193	0.215	-0.05	0.525
		3	0.193	0.149	0.003	0.539
		4	0.166	0.284	-0.037	0.47

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5	0.183	0.160	-0.046	0.564
6	0.203	0.201	0.019	0.583
7	0.196	0.226	-0.072	0.6
8	0.185	0.174	-0.130	0.492

[a] standard error of absolute term (Y-intersection)

Model for Kurgan Region:

$$Y = 1{,}07 \cdot X_1^{0{,}223} \cdot X_2^{0{,}963} \cdot X_3^{0{,}109} \cdot X_4^{-0{,}003} \cdot X_5^{0{,}405} \quad (3)$$

Normalized R^2 is 0.78. But despite the significance of the equation in accordance with *F*-statistics, not all the equation parameters proved to be significant. Only A-parameter, and λ – degree by *t*-statistics turned out to be at the 5% significance level. Relevance of all the functions constructed by *F*-statistics, in general, proved to be 5%.

Results of model construction for Orenburg Region:

$$Y = 1{,}012 \cdot X_1^{-0{,}045} \cdot X_2^{0{,}385} \cdot X_3^{0{,}428} \cdot X_4^{-0{,}115} \cdot X_5^{0{,}559} \quad (4)$$

In this case normalized R^2 equals 0.696. Statistically significant parameters are γ, and λ.

Growth rate of Regional Gross Domestic Product in Sverdlovsk Region is described with the equation below:

$$Y = 1{,}06 \cdot X_1^{0{,}577} \cdot X_2^{-0{,}094} \cdot X_3^{0{,}203} \cdot X_4^{-0{,}058} \cdot X_5^{0{,}329} \quad (5)$$

In this equation normalized coefficient of determination is 0.76. Parameters A, α, and λ proved to have significance for statistics.

The equation demonstrates dependence of Tyumen Region development:

$$Y = 1{,}025 \cdot X_1^{0{,}484} \cdot X_2^{0{,}467} \cdot X_3^{0{,}230} \cdot X_4^{-0{,}011} \cdot X_5^{0{,}642} \quad (6)$$

The normalized R^2 indicator is lower - 0.64, and only one parameter demonstrates 5% significance level – elasticity towards growth rate of per capita income (λ).

The equation below for Chelyabinsk Region demonstrates the highest determination coefficient - 0.81:

$$Y = 1{,}011 \cdot X_1^{0{,}728} \cdot X_2^{0{,}641} \cdot X_3^{0{,}075} \cdot X_4^{0{,}249} \cdot X_5^{0{,}494} \quad (7)$$

Parameters at the 5% significance level are α, δ, and λ.

The regression equation for Bashkortostan Republic is as follows:

$$Y = 1{,}023 \cdot X_1^{0{,}211} \cdot X_2^{2{,}222} \cdot X_3^{0{,}190} \cdot X_4^{0{,}002} \cdot X_5^{0{,}503} \quad (8)$$

Normalized R^2 is 0.7. Only λ degree had significance.

Economic growth of Udmurtiya is shown in the following equation:

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$$Y = 1{,}038 \cdot X_1^{0{,}658} \cdot X_2^{1{,}710} \cdot X_3^{0{,}156} \cdot X_4^{0{,}110} \cdot X_5^{0{,}406} \quad (9)$$

Normalized R^2 equals 0.78, while only α – parameter is significant.

And finally Perm Territory, and its dependence:

$$Y = 1{,}058 \cdot X_1^{0{,}772} \cdot X_2^{0{,}917} \cdot X_3^{0{,}157} \cdot X_4^{-0{,}050} \cdot X_5^{0{,}328} \quad (10)$$

Determination coefficient is 0.66, statistically significant parameter – α.

7. Conclusion

The regression equations obtained during the research let us make certain conclusions. First of all, α – parameter has the biggest values for Perm Territory (0.772), Chelyabinsk Region (0.728), and Udmurtiya (0.658). Slightly lower elasticity is demonstrated by the factor of industrial production growth rate (X_1) in Sverdlovsk Region (0.577). For all four regions mentioned above parameter α proved to be significant. Tyumen Region, despite the most pronounced industrial orientation, does not demonstrate elasticity of this variable. However, it doesn't mean that the industrial sector has no influence on regional development; using terminology of growth rate, this factor's elasticity is supposingly lower.

Variable "annual average number of employed persons growth rate" (X_2) demonstrates high elasticity in Bashkortostan Republic (2.222), and in Udmurtiya (1.710). Nevertheless, obtained parameters did not demonstrate significance; therefore conclusions about the impact of the labor factor should be made carefully. β – parameter proved to be significant only for Orenburg Region with value of 1.690. It demonstrates significant influence of employed growth rate on the region's development.

Degree γ, describing variable "fixed capital investment growth rate" (X_3), proved to be important only in the Orenburg Region equation, and amounted to the highest value among all the regions (0.428), that's why Orenburg Region can be characterized as the region with classic growth factors: employment growth, and fixed capital investment growth.

It should be noted that fixed capital investment is one of the most controversial factors of growth within any economic system. This study covers only the impact of investment on regions – beneficiaries' economic growth. We should also analyze the sources of investment. Industrial enterprises themselves, Russian government, or foreign investors? Moreover, influence of investment on donors often remains beyond the research (Sarin & Kumar, 2019).

Investment activity tends to be studied in one context with innovation activity. Influence of investment on economic growth, along with the source of investment and innovation activity are frequently discussed questions. According to Goridko and Nizhegorodtsev (2018), efficiency of investment multiplier is determined by availability of untapped resources. Exhaustion of resources at the same time leads to inflationary overheating. Innovation activity in the Urals varies considerably in the different regions. Tyumen Region, Sverdlovsk Region, Chelyabinsk Region, and Perm Territory are rated as "average innovation activity regions", while Kurgan Region, KMAR, and YNAR are classified as "low innovation activity regions". Intra-regional heterogeneity becomes evident in the equation (6), which is constructed for Tyumen Region taking into account KMAR, and YNAR. However, without them

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indicators of innovation activity in Tyumen Region are significantly higher. Highly profitable primary sector dominating in KMAR and YNAR doesn't give full picture of region's development level.

Elasticity of fixed assets growth rate (X_4) proved to have relevance only for Chelyabinsk Region (δ=0.249). For all the other regions this parameter was insignificant (negative for most of them).

It is noticeable that growth rate of per capita income (X_5) demonstrates high level of elasticity, moreover, λ – parameter proved to be significant for 6 regions. The biggest indicators are shown by Tyumen Region (0.642), Bashkortostan Republic (0.503), and Chelyabinsk Region (0.494).

On the one hand, obtained equations demonstrate similarity of regions: for example, order of figures within degree λ is approximately compatible (0.3-0.6). От the other hand, we observe that in some regions numbers are twice as high as in other, which points at totally different elasticity of impact. Growth rate of employment proved to be the most diverse ranging from -0.094 in Sverdlovsk Region to 2.222 in Bashkortostan Republic. The negative indicator for Sverdlovsk Region demonstrates the redundancy of the workforce in the region, but at the same time, this indicator proved to be insignificant. Therefore such conclusions need extra confirmation.

Economists nowadays claim that the Urals Macro-region is mostly formed by economic integration between Chelyabinsk Region, and Sverdlovsk Region. Economic synchronization coefficient is 0.907 (Kurushina & Petrov, 2018). The coefficient is defined by the regions' economic dynamics, evaluated by the coefficient of pair correlation regarding relative growth rate of Regional Gross Domestic Product. The same coefficient for Tyumen Region, and Kurgan Region equals only 0.435, therefore, according to the strategy of spatial development, it is necessary to divide regions of the Urals Federal District, and observe them as parts of different Macro-Regions.

According to standardization of Russian entities, the regions of the Urals belong to different groups. All eight regions are very different from each other. But there is one feature: in dynamics belonging to a certain status remains unchanged. Yusupov et al. (2019) rank the regions analyzing Regional Gross Domestic Product, and Gross Domestic Product, for instance they studied the ratio for 2001 and 2016, and created kind of regional matrix. Bashkortostan Republic, Perm Territory, Sverdlovsk Region, Tyumen Region, and Chelyabinsk Region proved to be in the quartile of regions, where Regional Gross Domestic Product exceeded average Russian GDP in 2001 and 2016. Udmurtiya, Kurgan Region, and Orenburg Region were placed in the fourth quartile, where in 2001 and 2016 Regional Gross Domestic Product was below average Russian GDP. Volatility of dynamics is evident.

Despite economic heterogeneity of the Urals, one common factor remains unchanged – industrial origins of the regions. Manufacturing share in the structure of gross value added exceeds average Russian indicator (33.4%) almost in every region, except Kurgan Region (30.4). That's why modern scientists and economists call for modernization of economy towards industrial development (Bodrunov, 2019; Lavrikova et al., 2019; Silin et al., 2017a; 2017b). As for current established tendencies, probably with the new "postpandemic reality" economic systems will demonstrate new dynamics, because in economic terms ongoing situation can be characterized as "shock". Sluggish and stagnant economics cannot discover regions' hidden potential, and it is only "shock" that can do it. This issue is to be studied in the following researches with the advent of a new "postpandemic reality".

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