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АНАЛИЗ И ПРОГНОЗ ВНУТРИРЕГИОНАЛЬНОГО ПРОДУКТА КЫЗЫЛОРДСКОЙ ОБЛАСТИ

В данной работе рассматривается анализ и прогнозирование внутрирегионального продукта Кызылординской области. С помощью корреляционно-регрессионного анализа рассчитана многофакторное регрессионное уравнение ВРП. Для оценки влияния показателей основных отраслей на ВРП региона и определения необходимых темпов их развития использованы статистические данные Кызылординской области за 2005-2015 годы. Приведена оценка влияния показателей основных отраслей на ВРП региона. Расчет показателей для оценки значимости полученной модели и ее параметров проведен с использованием инструмента «Регрессия» задачи «Анализ данных» MSEXCEL.

Ключевые слова: внутрирегиональный продукт, прогнозирование, многофакторная модель, регрессионный анализ, экономика региона.

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ANALYSIS AND FORECAST OF INTRACREGIONAL PRODUCT OF KYZYLORDA REGION

In this research work analysis and forecasting in intra-regional product of Kyzylorda region is considered. By means of the correlation-regression analysis, the multiple-factor regression equation of regional product is calculated. Influence to assess the performance of major industries in the regions intra-regional product and determination of the statistical data used for the Kyzylorda region, 2005-2015.

Keywords: intra-regional product, forecasting, multiple-factor model, regression analysis, region economy

The gross regional product (GRP) is the main macroeconomic indicator that characterizes the level of economic development of the region, reflects its economic potential. It is the sum of gross value added by types of economic activity and net taxes on products and imports.

The results of a comprehensive analysis of the development of basic types of economic activity in the Kyzylorda region in connection with the dynamics of demographic processes and changes in the state of labor resources can be used to determine the stable patterns of changes in the socio-economic indicators of regional development and the degree of their mutual influence.

The share of the gross regional product of the Kyzylorda Oblast in the country's GRP has remained unchanged at 3.8-3.9% for the past several years. During the last ten years, GRP has been growing.

At the end of 2015, it amounted to 1176.6 billion tenge or 103.7% to the level of the previous year. The largest share in the structure of GRP was made by the following sectors: mining – 42.7%, transport and warehousing – 11.2%, construction – 7.9%, real estate transactions 5.4, trade 5.1%, less than 3% – Agriculture, manufacturing and electricity.

The tasks set by the President to stimulate economic growth and the «Strategy for the socio-economic development of the region until 2020» requires the unconditional realization of the main goal of developing ahead of schedule and contributing to the development of the country.

In the adopted Strategy it was determined that for this it is necessary to develop the region with GRP rates 2% higher than the republican one.

In the region, following the results of 2015, positive dynamics was achieved on a number of important economic indicators: the growth rates of manufacturing industry, the volume of construction and retail turnover, investment of investments, the receipt of taxes to the budget and other indicators, and the expected forecast of the gross regional product of 2016 is assumed not lower than last year's level.

To assess the impact of key industry indicators on the GRP of the region and determine the necessary rates of their development, a multi-factor correlation-regression analysis of the GRP of the Kyzylorda region for 2005-2015 was carried out.

The matrix of GRP dynamics and the factors influencing it, according to the Agency for Statistics for Kyzylorda region, is presented in Table 1.

Table 1 – The matrix of GRP dynamics and the factors influencing it (in %)

Name	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
GRP growth,%	24,9	19,5	3,1	-3,5	17,2	7,1	4,8	-0,7	3,8	5,9	3,7
X1 – rate of growth in agricultural production of agriculture	2,6	7,7	7,7	0,9	1,8	-1,0	-3,1	12,2	8,2	-1,9	3,5
X2 – growth rate	36,4	18,6	8,2	-15,6	29,3	3,0	-1,9	-1,0	1,4	0,1	0,6

of the mining industry's mining industry												
X3 – growth rate of the FO of the manufacturing industry	11,5	58,1	39,2	10,1	21,7	22,9	18,1	-7,0	11,1	0,5	5,8	
X4 – rate of increase in construction FD	22,5	84,1	56,1	14,7	21,8	38,0	56,9	15,3	1,1	43,5	6,3	
X5 – growth rate of the wholesale unit of retail turnover	5,9	24,3	16,3	16,1	11,3	18,1	20,4	31,1	45,0	10,3	17,9	
X6 – growth rate of freight turnover turnover of freight	13,8	10,4	2,2	9,7	19,6	7,8	-0,5	-4,2	14,2	44,6	5,2	
X7 – growth rate of communication services of communication services	9,2	17,0	14,0	23,6	20,4	26,1	19,7	10,6	7,8	10,7	7,0	
X8 – rate of increase in electricity, gas, steam, gas, steam	55,2	57,2	29,4	2,9	2,5	25,6	4,7	16,8	4,5	-0,8	32,8	

Calculation of indicators to assess the significance of the model and its parameters was carried out using the tool «Regression» of the problem «Data Analysis» MS EXEL (Table 2).

An estimation of the statistical significance of the regression equation was carried out using the F-criterion of Fisher. The actual value of the F-test of Fisher:

$$F = 42.69$$

The table value of the criterion at a five percent level of significance is $F_{tbl} = 0,08$.

Since $F = 12,05 > F_{\text{tabl}} = 0,08$, the regression equation is considered statistically significant.

The multi-factor regression model of GRP for the Kyzylorda region is as follows:

$$y = -5,9 - 0,49 x_1 + 0,51 x_2 + 0,05x_3 + 0,03 x_4 + 0,23 x_5 + 0,13 x_6 + 0,17 x_7 + 0,15 x_8, \quad (1)$$

Where: y – the GRP gain in %

x_1 – the rate of growth of the agricultural product of agriculture in %

x_2 – growth rate of the mining industry in%,

x_3 – rate of increase in manufacturing sector GDP in%, Table 2.

The results of the analysis of the model and their parameters are presented in Table 2.

Table 2 – The results of the analysis of the model and its parameters

Регрессионная статистика								
Множественный R	0,989785597							
R-квадрат	0,979675527							
Нормированный R-кв	0,898377636							
Стандартная ошибка	2,825500473							
Наблюдения	11							
Дисперсионный анализ								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Значимость F</i>			
Регрессия	8	769,6330941	96,20413677	12,05044204	0,078852798			
Остаток	2	15,96690585	7,983452926					
Итого	10	785,6						
	<i>Коэффициенты</i>	<i>стандартная ошибка статистики</i>	<i>P-Значение</i>	<i>Нижние 95%</i>	<i>верхние 95%</i>	<i>Нижние 95,0%</i>	<i>Верхние 95,0%</i>	
Y-пересечение	-5,992520396	6,115677241	-0,97986211	0,4304792	-32,30615577	20,32111	-32,30615577	20,32111498
x_1	-0,491433536	0,311885837	-1,57568404	0,255790148	-1,833369984	0,850503	-1,833369984	0,850502911
x_2	0,513157347	0,086911534	5,904364203	0,027506878	0,1392072	0,887107	0,1392072	0,887107494
x_3	-0,052940982	0,108438052	-0,48821406	0,673678267	-0,519512261	0,41363	-0,519512261	0,413630297
x_4	0,033186539	0,061342475	0,541004232	0,642703787	-0,23074883	0,297122	-0,23074883	0,297121908
x_5	0,225660699	0,1371462	1,645402493	0,241625126	-0,364431772	0,815753	-0,364431772	0,815753171
x_6	0,132291422	0,095484484	1,385475594	0,300188324	-0,278545153	0,543128	-0,278545153	0,543127997
x_7	0,167093779	0,225622906	0,740588719	0,53608631	-0,803683233	1,137871	-0,803683233	1,13787079
x_8	0,153394863	0,074626849	2,055491624	0,176157039	-0,167698553	0,474488	-0,167698553	0,474488279

x_4 – rate of growth in construction in%,

x_5 – growth rate of the wholesale unit of retail turnover in%,

x_6 – growth rate of freight turnover in%,

x_7 – rate of increase in the number of communication services in%,

x8 – rate of growth in the amount of electricity, gas, steam in%.

The estimation of the obtained coefficients of the GRP model obtained shows that:

- an increase in production of 1% in the mining sector contributes to an increase in GRP by 0.51%;
- an increase in production of 1% in the manufacturing industry contributes to an increase in GRP by 0.05%;
- the increase in the volume of construction works in 1% contributes to an increase in GRP by 0.03%;
- the increase in the volume of retail turnover in 1% contributes to an increase in GRP by 0.23%;
- the increase in the volume of freight turnover of 1% contributes to an increase in GRP by 0.13%;
- an increase in the volume of information and communication services by 1% contributes to an increase in GRP by 0.17%;
- an increase in the volume of electricity, gas, steam by 1% contributes to an increase in GRP by 0.15%.

In agriculture, with an increase of 1%, GRP fell by 0.49%, which indicates a low efficiency of the industry, that is, a change in the pace of agriculture has a slight effect on the rate of increase in GRP.

The calculations also show that 1% of the increase in the mining sector is comparable to the contribution to the growth of the manufacturing industry by almost 20%.

So 1% of the growth in the mining industry increases GRP by 0.51%, and the growth in manufacturing by 119.3% in 2015 affects the GRP growth by 0.58%, that is, the reduction in the mining sector can be compensated for by growth in processing and other industries, which was stipulated by the «Strategy of social and economic development of the Kyzylorda region until 2020».

It should be noted that gross added value is calculated at the level of branches as the difference between the release of goods and services and intermediate consumption.

Analysis of the formation of GRP by the end of 2015 shows that in the manufacturing industries, as a rule, the share of intermediate consumption, including expenditures for own consumption is rather high. And, on the contrary, in the branches connected with the sphere of providing services, the share of own consumption is not so high and more than 60% of the created gross output in these industries forms GRP.

In addition, the model obtained shows that after the mining industry, the growth in the sphere of services (retail turnover, transportation services, communications, etc.) gives a greater effect, therefore, taking into account the low cost of own production and the contribution to the formation of GRP, the full development of the service sector is necessary.

According to the results of the 1st quarter of 2015, the index of physical volume (IFO) of the mining industry was 96.2 to the level of the corresponding period of the previous year, while the volume of oil production fell to 95.3%, IFO construction works – 62.8%. There is an increase in IFI in agriculture, manufacturing, trade, transport and other industries. The calculation shows that, while maintaining such rates, the expected GRP will be only 100.56%.

Therefore, taking into account the pace of decline in the main mining industry and the need to meet the region's target, we consider it necessary to unconditionally implement the growth rates approved by the Strategy at the level: in agriculture – 5%, manufacturing – 15%, electricity supply – 10%, construction – 8%, trade – 15%, transport – 15%, information and communication services – 10%.

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