

# Instability of socio-economic and sustainable development of Ural regions

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**Abstract.** Problems of development stability of regional economies are of particular importance in current conditions. The article presents the analysis of the sustainability of the development of Russian regions included in one of the most industrially developed federal districts - the Ural. The study used data from Rosstat for 2001-2019. The tendencies of the instability of indicators of socio-economic development of regions are revealed: gross regional product, investments in fixed assets, industrial production, and consumer prices. It has been established that the dynamics of the growth rates of these indicators are volatile. At the same time, all trends demonstrate a reasonably rapid recovery after the external shocks of 2008 and 2014. These indicators' volatility was assessed using the variation coefficient in three different periods: 2001-2008, 2010-2014, and 2015-2019. The conclusion is made about the high instability of regional socio-economic development, while the level of instability in regions with a lower level of development turned out to be higher than in more developed ones. Particular attention is paid to trends in the level of instability, and it is noted that over time, less developed regions increase instability at a faster pace.

## 1 Introduction

New normal requires new approaches and methods of analysis and assessment of trends in regions' economic development. In the formation of the region's financial stability, it is faced with internal influences that did not exist in the previous period. At the same time, they have a direct impact on the stability of the regions. First of all, the regional economy's stability is influenced by the transition to its turbulent development, the growth of entropy, that is, the instability of socio-economic development. A group of factors arises that enhances instability and reduces the region's economy's stability, transforming it, and a relatively stable ecosystem is unstable, unable to ensure the unity of socio-economic institutional, ecological development. During this period, there is a reduction in the region's resource potential, which cannot meet the vital needs of people living in the region to create zones of their favorable residence in these territories. The factors of the instability of the regional economy in turbulence conditions include, first of all, external factors that must be taken into account when assessing the level of their dynamic development.

Instability is associated with such economic factors as a decline in production, rising

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inflation, weak investment activity, and a reduction in aggregate demand; also, a decrease in the capacity of the market for goods, a decrease in demand for goods and services, an increase in monopoly in the national economy, which is reflected in the costs of producers and a decrease in the production activity of economic entities. External factors of instability make adjustments to the increase and decrease in the estimated sustainable development indicators of the regional economy.

The issues of regional development and its instability are considered in the works of A. Naydenov [1], Y. Willi et al. [2], K. Rentkova [3], Lovric et al. [four]. National characteristics of sustainable development and factors influencing it are described in A.A. Davidescu et al. [5], H. Rahma et al. [6], A.M. Bercu [7], R. Eversole and M. Walo [8], V. Barkhatov et al. [9]. The formation of effective public policy is analyzed in P. Lee and D. Keegan [10]. The authors note the importance of the regional level in public administration and the focus of scientific research due to the increasing role of regions in the country's socio-economic development.

The article aims to analyze trends in the instability of regional development of Russian regions belonging to the Ural Federal District (Sverdlovsk, Chelyabinsk, Tyumen, and Kurgan regions).

To achieve this goal, the following tasks were consistently solved:

1. Analysis of trends in indicators of socio-economic development (gross regional product, investment in fixed assets, industrial production, and consumer prices) in order to identify instability in the values of their growth rates
2. Calculation of the coefficients of variation of the selected indicators for three periods: 2001-2008, 2010-14, and 2015-2019
3. Analysis of the degree of variation (stability) and tendencies of its change by periods.

## 2 Data and Methodology

Sustainable development, everything should be based on an assessment of trends in the factors of the instability of the regional economy, reflecting the dynamics of development indicators and allowing conclusions to be drawn about the actual trends of regional development. Such an assessment of sustainable development trends allows us to determine the regional economy's stages to a new normal in a turbulent external environment. At the same time, entropy grows, and the region's economy loses its ability to move forward to a stable state, goes into a stagnation regime. The existing production, scientific and technical, human potential, and accumulated innovations cannot independently, without state support, move to a new higher level of development. We will assess the sustainable development of the Ural Federal District's regions based on factors and indicators of instability. Assessment of the stability of regions depends on the instability of socio-economic development, which, in turn, is understood as a decrease in the growth rate of external and internal development indicators.

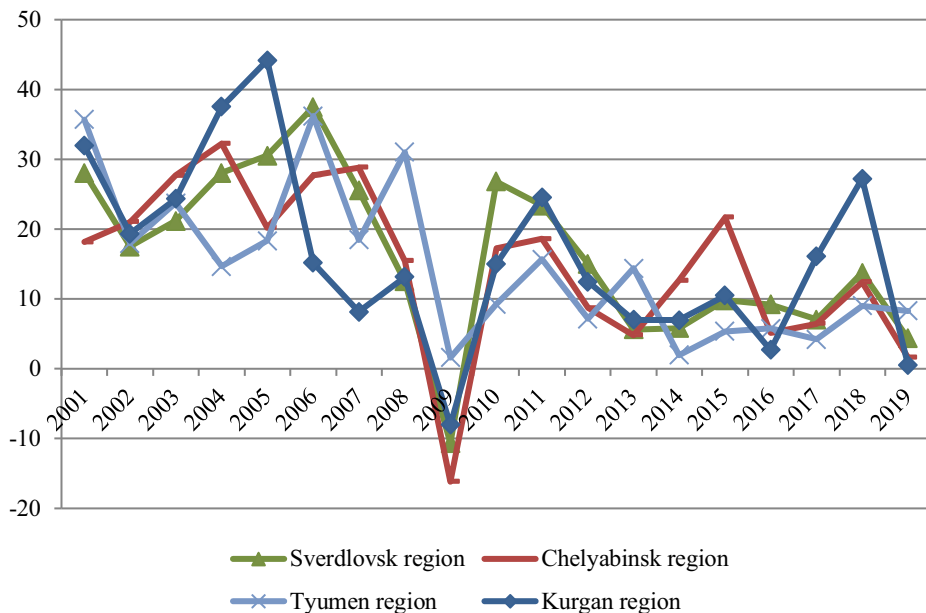
The article uses the official data of Rosstat, in particular, four indicators of regional development: gross regional product, investment in fixed assets, industrial production, consumer prices. To assess the instability of development, the increments of all the above indicators were calculated in dynamics for 2001-2019. Separately, these indicators' variation coefficient was assessed for three time-intervals: 2001-2008, 2010-2014, and 2015-2019. It allows concluding the trends of instability both in individual regions and in the Ural Federal District. 2009 is excluded from the analysis as an anomalous observation that distorts the summary analysis.

The conclusion about the indicator's stability was made based on the analysis of the values of the indicator of variation - if it was less than 0.33, then the indicator was recognized as stable. The conclusion about the presence of a trend was made based on

comparing the indicator for different periods: if these values had a certain tendency to increase or decrease, then this was recorded in the table, if there were high fluctuations, then the trend was designated as up and down rally, and if the values in different periods were close, it was concluded "no tendency".

### 3 Results

Let us consider the first indicator's dynamics: the gross regional product's growth rate (fig. 1). Visual trend analysis reveals two important points. Firstly, different regions do not have uniform trends in the change in this indicator, which is influenced by various factors, including internal and external economic and the amount of state support sent to the region. Secondly, with a general decrease in the indicator's growth rate (primarily explained by a significant decrease in inflation, from 10 to 4%), the degree of variation of individual values remains very high, which indicates instability.

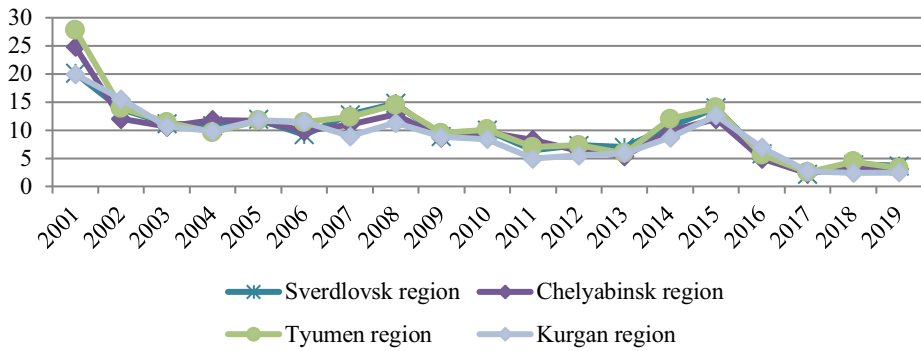


**Fig. 1.** Gross regional product growth rate (%) in 2001-2019, Ural federal district.

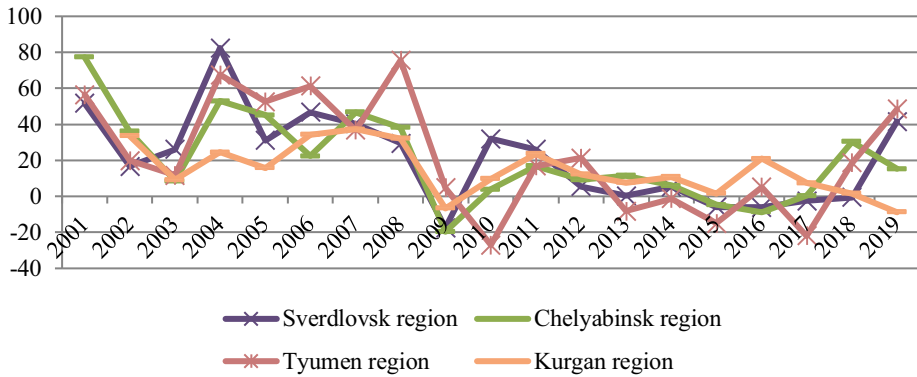
Much smoother and more stable dynamics characterize the analysis of the following indicator of consumer price growth rate (fig. 2). This is because the Central Bank of Russia is implementing a reasonably strict policy to curb inflation and other executive authorities' price control. The graph shows a downward trend in the rate of growth of the price level, which was violated twice - in 2008 and 2014-15, when due to external factors (primarily the growth of foreign exchange rates) there was a sharp rise in prices for imported goods and services, and also production resources. It should be noted that the tendencies of this indicator change in different regions are not repeated but have similar dynamics. The values for the least developed Kurgan region are subject to the smallest fluctuations.

The third considered indicator, the growth rate of investments in fixed assets, demonstrates high volatility (fig. 3). After 2008, there was also a growth slowdown but remained reasonably high - about 20% per year. This trend is explained by the overheating of the economy in the period before the 2008 global crisis. Today, investment plans of enterprises

and the state are drawn up more systematically and wisely. At the same time, it should be noted the growth of this indicator in 2018-19 in the leading regions (Sverdlovsk and Tyumen regions) to the levels of 2005-06.

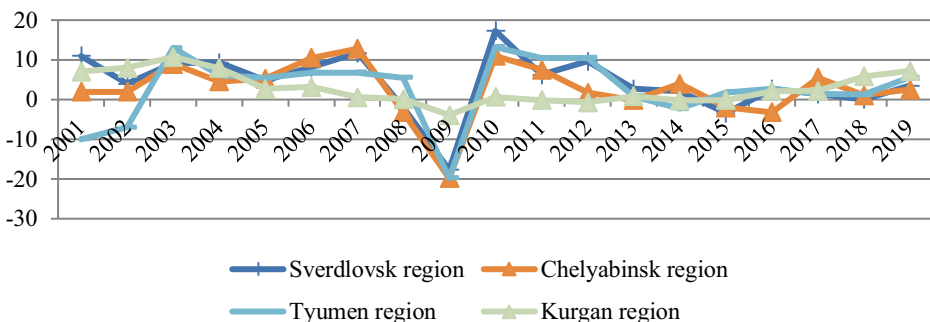


**Fig. 2.** Consumer prices growth rate (%) in 2001-2019, a Ural federal district.



**Fig. 3.** Investment in fixed assets growth rate (%) in 2001-2019, a Ural federal district.

The fourth indicator is the industrial production growth rate (fig. 4). This indicator demonstrates relatively high stability (except for shocks in 2009 and 2015 caused by external factors). Simultaneously, the regional economies are synchronously adapting to the new economic conditions of management, and since 2015 have been demonstrating a steady growth of this indicator (in fixed prices).



**Fig. 4.** Industrial production growth rate (% in fixed prices) in 2001-2019, a Ural federal district.

At the next stage of the study, we will analyze the coefficients of variation of the calculated indicators for three periods: 2001-2008, 2010-2014, and 2015-2019. These periods are between two external shocks that have had a severe impact on the Russian economy: 2008 - the global financial crisis and 2014 - Western sanctions (see Table 1).

**Table 1.** Variance coefficients of instability indicators Ural's regions of Russia.

Growth rate of	Variance coefficients, by period.			Stability	Tendency
	2001-2008	2010-2014	2015-2019		
Sverdlovsk region					
Gross regional product	0.2927	0.5695	0.1451	stable	decreased
Investments in fixed assets	0.4700	0.9164	0.5407	unstable	up and down rally
Consumer prices	0.2389	0.2060	0.3749	unstable	increased
Industrial production	0.6050	0.7329	0.4736	unstable	up and down rally
Chelyabinsk region					
Gross regional product	0.2333	0.4163	0.3677	unstable	up and down rally
Investments in fixed assets	0.4682	0.4756	0.5820	unstable	increased
Consumer prices	0.3460	0.2254	0.3280	stable	no tendency
Industrial production	0.9127	0.8298	0.8312	unstable	no tendency
Tyumen region					
Gross regional product	0.3289	0.5150	0.0954	stable	decreased
Investments in fixed assets	0.4468	0.5769	0.7122	unstable	up and down rally
Consumer prices	0.3824	0.2656	0.3683	unstable	no tendency
Industrial production	2.1757	0.9355	0.3491	unstable	decreased
Kurgan region					
Gross regional product	0.4891	0.4906	0.5179	unstable	no tendency
Investments in fixed assets	0.3687	0.4427	0.4986	unstable	increased
Consumer prices	0.2702	0.2339	0.3911	unstable	increased
Industrial production	0.7237	5.6921	0.9699	unstable	up and down rally

Analysis of variance coefficients for selected indicators reveals trends such as:

1. In general, the sample is characterized by instability in the values of leading indicators' growth rates. Simultaneously, only the values of the gross regional product in highly developed regions - Sverdlovsk and Tyumen regions can be called stable.

2. In the same regions, there is an instability decrease tendency in indicators, but there is no such tendency in other regions, and the opposite is presented.

## 4 Conclusion

As a result of the study, trends in the instability of the socio-economic development of the Urals regions were revealed. First, the indicators reflecting economic growth and industrial development and the investment attractiveness of regions are in a state of high fluctuations from year to year. Secondly, these indicators fluctuate asynchronously. Each region and each indicator has its logic of changes and its specific factors. Thirdly, the reaction of the

considered indicators to the external shocks of 2008 and 2014 is generally positive, and the restoration of the indicators' values to the "normal" level occurs relatively quickly. Fourth, the indicators themselves are characterized by their values' instability, even if we consider them in the relatively homogeneous periods of 2001-2008, 2010-2014, and 2015-2019. Fifth, relatively more prosperous regions are characterized by less instability in socio-economic development indicators.

Further research is advisable to conduct in the following three areas: (1) analysis of a more significant number of regions, throughout Russia and in other countries with a similar economic structure; (2) analysis of a more significant number of indicators, including those reflecting demographics, living standards, and innovation; (3) analysis of specific and general factors affecting the instability of the socio-economic development of the economy.

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