

# Inertia of the Regional Economic System: Distinctive Features and Manifestations

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## ABSTRACT

The article discusses the problems of inertial development of the regional economy and economic slowdown and identifies the factors that cause inertia in conditions of instability of the domestic economy and unfavorable environment. The reasons for economic inertia are revealed, and the need for an effective mechanism for overcoming the inertia of the economic recession that responds to modern challenges and risks as well as threats to Russia's economic security is shown. The factors that aggravate the problem of the economic slowdown in Russian regions are identified.

**Keywords:** *economy, inertia, region, stagnation, innovation, economic development*

## 1. PROBLEM STATEMENT

The relevance of the research topic is defined, first, by the novelty of the scientific objective being solved, and secondly, by the fact that the problem of creating a theoretical and methodological framework that would define a scientific methodology for overcoming the braking mechanisms, which are the major cause of economic inertia, has not been solved at present.

The problem is caused by the existing contradictions between the needs for sustainable development of the regions and the inertia of the national and regional economy stemmed from long-standing structural problems, which has been aggravated by the economic crisis, sanction pressure on the Russian economy, and the turbulence of the environment.

All this forces the regions to face the need for intensifying efforts to promote economic growth, develop the industrial sector, and create conditions and prerequisites for overcoming the inertia of stagnation. That is why the study of the essence and content of the mechanism for overcoming the inertia of the regional development and increasing economic activity in the regions is a major task. This determines the relevance of the problem under study.

## 2. ANALYSIS OF RECENT ACHIEVEMENTS AND PUBLICATIONS

In our opinion, the problem of inertia of socio-economic systems is at the initial stage of theoretical understanding. The analysis has shown that currently there are very few scientific and theoretical developments specifically focused on economic inertia. Certain aspects of the problem are certainly considered in a fairly wide range of research in other scientific fields (mechanics, physics, philosophy, and cultural studies).

The common factors of functioning and development of socio-economic systems are studied in the works of G. B. Kleiner, Ya. Kornai, V. I. Kostyuk, V. V. Mogilevsky, and M. Setrov. Among the researchers who have contributed to the study of the modern problems of Russian regional development, the factors of their braking and development, we would like to mention such authors as P. A. Minakir, V. I. Klistorin., L. I. Vlasyuk, N. I. Lapin, V. N. Leksin, V. E. Rokhchin, S. A. Suspitsin, A. G. Shelomentsev, and others.

Among the economists conducting research on the problem of inertia of economic systems, one can give credit to the works of such authors as S. Clarke, J. S. Mill, P. Ya. Baklanov.

In recent years, there have appeared works on the problems of inertia of socio-economic systems by such authors as N. G. Barashov, V.L. Sidnina, K. V. Pavlov, A. I. Kibitkin, Yu. A. Zhuravsky, and others.

A number of scientific papers consider the inertia of thinking and consciousness of managers, as well as social and psychological mechanisms of inertia production (R. E. Pryadukhina, A. A. Derkach) and their influence on managerial decision-making.

The analysis of the scientific literature on the subject under study has shown that the coverage of the problem of inertia of systems in the works of different authors is reduced to the following:

inertia was characterized as stability and tendency to be preserved in the absence of disturbing factors [1];

it is mere inertia that causes some individuals in society to produce or accumulate [2];

«...inertia is a situation when following a tradition, an established system of values, instincts and rationality are introduced into a certain political framework...» [3];

inertia of systems is the ability to maintain the structure and high stability, that is, to continue to function after external influences [4];

economic inertia reflects the stability of the development of manufacturing relations and the ratio of interacting socio-economic forces [5].

Despite the considerable experience in the study of inertia in mechanics and philosophy, in recent years there have been very few published papers that concern the inertia of the economy, tools for regulating the economy during periods of stagnation, and inertia. In this respect, there was a need for solving theoretical and methodological issues of the inertia of the national economy. It should also be noted that there is a clear lack of scientific works in the field of research on the inertia of regional development.

### **3. AIMS AND OBJECTIVES OF THE WORK**

The aim of this work is to develop a scientific and methodological basis for solving the problem of overcoming negative manifestations of regional development inertia in the conditions of continuing economic stagnation.

To fulfill the aim, the following tasks were solved in the paper:

- study of the essence and role of inertia;
- study of the manifestations of the economic inertia and its inconsistency;
- analysis of the factors braking and accelerating economic growth in a region;
- analysis of indicators describing the economic situation in Tomsk oblast;
- development of the concept of overcoming the inertia of the economic recession in terms of the development of the regional economic complex under the protracted economic stagnation.

The object of the study is the inertia of regional economic systems in the current circumstances of development.

The subject of the study is the theoretical and practical aspects of the inertia of the development of Russian regions in the current conditions of the protracted economic stagnation.

### **4. THE BASIC STUDY MATERIAL**

The category «inertia» has been introduced into scientific parlance as a certain abstraction to reflect the property of matter to maintain a stable, uniform motion as a result of the absence and/or counterbalance of external influences. In the Small Brockhaus and Efron Encyclopedic Dictionary, inertia is defined as the inability of a body to change its state of rest or motion without the assistance of external forces, which means that each body is at rest or in the state of uniform rectilinear motion, if the forces acting on it do not force it to change the state [6].

Inertia manifests itself through the preservation of existing parameters of motion (rest); it prevents the emergence of new system relationship, reactions, properties and characteristics of the system.

Inertia implies that the system takes some time to change the state and rate of development after the application of controlling actions. The most inertial system of two is the one that changes its state more slowly under the same influences. Inertia is controversial. High inertia can display itself both as a positive property in case there is weak sensitivity of the socio-economic system to external disturbing influences (preserving of its stability under crisis), and as a negative property demonstrating insensitivity (unresponsiveness) to external controlling actions. The low inertia of the system is also characterized by both positive properties (high controllability) and negative ones (response to random disturbances) [7].

Regarding economic inertia, in the most general terms, it can be described as a property of economic systems and objects to maintain or change their state very slowly. It reflects the degree of development and stability of economic relations, as well as the ratio of interacting socio-economic forces. Economic inertia is caused, «on the one hand, by the scale of large economic objects and the size of the economic "mass", and, on the other hand, by the inertia of the individuals' thinking as well as by the inertia of management bodies of economic objects and processes».

From the position of inertia, the study of the process of economic development involves clarification of how transformation of the economy (or, on the contrary, the refusal of them) can be generated by both driving and development restraining forces.

Inertia is one of the least studied properties of the economic system. As a characteristic of an economic system, inertia reflects the ability of a system to maintain its state (characteristics and structure) and direction of motion unchanged until certain forces change its state.

It is known that the functioning mechanism of any economic system is determined by the feedback, that is, by reactions to the power of influence. The application of the positive and negative feedback theory can promote identifying the true nature of inertial mechanisms and braking mechanisms of the regional economy as a complex dynamic system. It was A. A. Bogdanov who stated that both negative and positive feedback is necessary for the development of an organization of any nature. If feedback strengthens the result of the initial impact of the cause, it is called positive; if it weakens the result, it is labeled as negative. Positive feedback destabilizes the system, while negative feedback contributes to stability preservation.

The region as a complex self-developing system also has a set of mechanisms, some of which play the role of positive feedback, and others – of negative one. The former are responsible for the system development, its increasing complexity, and the variety of elements. The latter accounts for the system stability and the preservation of the existing quasi-equilibrium. The separation of these mechanisms is highly hypothetical. However, it provides a qualitative representation of the nature of complex regional economic system functioning [8].

Currently, Russian regions are experiencing negative trends and processes that hinder their economic

development and create certain threats to the national and regional security. In recent years, regional economic systems, as well as the Russian economy as a whole, have been experiencing serious problems due to decline in production, capital export, and financial and investment starvation. From 2012 to 2018, foreign direct investments in the Russian economy decreased by about five times in relation to GDP. While in 2008, according to the World Bank, foreign direct investments in the Russian economy reached 4.5% of GDP, in 2018, they were 0.5% of GDP [9].

According to the Russian Federal State Statistics Service, RF GDP growth decelerated to 1.3% in 2019. Moreover, in 2019, the main contribution to the GDP growth was made by the growth in household consumption as well as the growth of gross fixed capital formation and net exports. At the end of 2019, the share of final consumption expenditures in the GDP structure was 69.3% (67.9% in 2018), including the share of household expenditures, which was 50.3% (49.7% in 2018), and the share of public administration expenditures, which was 18.6% (17.8% in 2018) [10].

National projects are not fully implemented in many regions. Russian regions are losing their investment attractiveness, which, in turn, slows down economic growth and causes stagnation to enhance.

Stagnation is also a manifestation of the inertia in economy. The reasons for stagnation lie in the action of specific braking mechanisms reflecting the contradictory nature of the modern economic development and are manifested in the complex interrelationship and interdependence of a whole set of factors constraining regional development.

From the system point of view, a region can be represented as a complex system that is characterized by a large number of interconnected subsystems of various types, complex relationships between them, hierarchical structure, high dynamism of elements, and shares the property of inertia.

Inertia is one of the least studied properties of the regional economic system. Let us consider the identification of the manifestation types and properties of the region inertia as a complex nonlinear system.

The essence of the inertia of the regional economic system lies in the delay and non-instantaneous reactions of the system to the power of influence. It manifests itself inconsistently: first, during the periods of economic recession, inertia originally contributes to maintaining the stability of the regional system for a certain time by preserving certain economic forms and directions of their development, and secondly, inertia prevents the formation of new elements, connections, directions, and characteristics of the movement.

Based on the above, universality, multi-levelness, inconsistency, scope (scale) of action, rate and time of manifestation, and others can be considered as the key features of the regional economy inertia.

The types of manifestation of economic inertia can be studied based on the structural elements of the regional economic system, reproduction phases, a type of economic

structures, industries, and so on. A number of researchers actually suggest calculating the index of the degree of economy inertia, which is an aggregate index of the inertia of all the elements of the economic system [11].

It should also be noted that the inertial characteristics of the regional economy are determined by the resource structure, production structure, and region infrastructure. In Russia, there is persistent inertia of the unbalanced economy, inertia of demographic processes, education, motivation, and so on. Also, during the process of the state's influence on inertia processes, the inertia of the economy, the inertia of institutions, the inertia of public servants' way of thinking, and the inertia of economic policy itself are intertwined.

The paper develops and justifies the hypothesis that the regional economic system has a property of inertia, as well as that, on the one hand, the inertia of the economy can be controlled and regulated, but, on the other hand, it can be stochastic (random). At the same time, if the inertia of the economy is controlled, then inflation, the system of interest and tax rates, credit, savings, and investments are sufficient evidence that the expectations of economic changes (including changing rates on the deposits and exchange rates) are inertial.

Conversely, if the inertia of the economy is stochastic, then expectations, inflation, consumption, savings, investment, income, and credit in their process of change will lead to the fact that they create the prerequisites for economic inefficiency, where the cost and availability of credit and financial resources do not contribute to an increase in product (service) output.

One can distinguish between the inertia of the state and the inertia of the dynamics of the regional system. Under the inertia of the state, we should understand the preservation of the current structure of the system. Under the inertia of the dynamics — the preservation of the direction of movement (development). Therefore, we can say that the inertia of the dynamics is the degree of change in the rate of movement (development), at which the system still retains the specified direction of its movement [12].

The study analyzed the socio-economic situation in Tomsk oblast over the course of 5 years based on the analysis of official statistical data of the Federal State Statistics Service in order to identify the signs of inertia in the regional economic system.

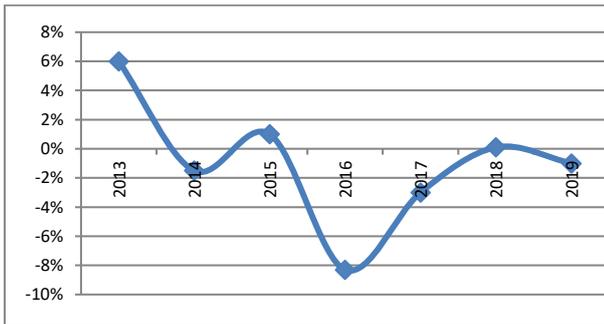
A socio-economic development strategy until 2030, which defines strategic priorities, goals, and objectives of the development of Tomsk oblast, and the main directions for achieving them in the long term, has been developed and approved in Tomsk oblast.

The socio-economic development strategy of the region assumes that the region should have reached a GRP growth rate of at least 3% starting in 2016, and by 2030, the region's GRP should grow by 75.1% compared to 2013 if the optimistic case development scenario is implemented.

The optimistic case scenario assumes that the real disposable income of the population will increase by 0.5% in 2017 and will continue to grow at a rate of at least 2% in the future. As a result, the real income of the population

in 2030 should grow by 63% compared to the level of 2013 if the optimistic case scenario is implemented [13]. Under the optimistic case scenario, the share of manufacturing in GRP will be 15.4% of GRP in 2030, rising from 10.4% in 2012 to 13.3% in 2020 and 14.3% in the forecast year of 2025.

Thus, the socio-economic development strategy of Tomsk oblast until 2030 is focused on the development under the optimistic case scenario. In fact, the economic development indicators of Tomsk oblast show a completely different pattern (Fig. 1).



**Figure 1** Real income of the population of Tomsk oblast measured in % in comparison with the previous year

In real practice, the economy grew more slowly in 2016–2019, according to the data that reflect the actual situation in the region.

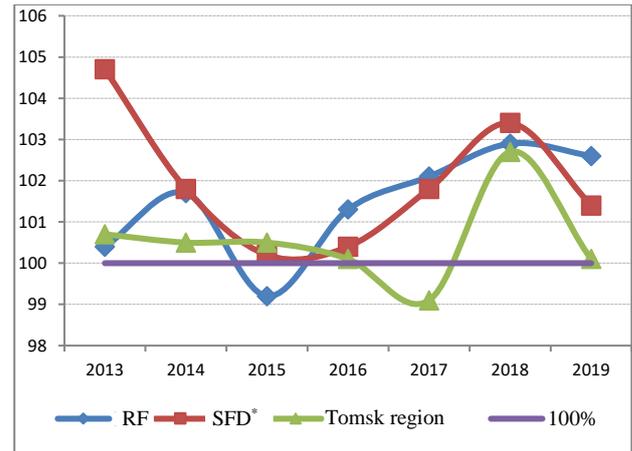
The growth of the industrial production over the past three years is very unstable and insignificant. In the extractive industry, as well as in the electric power industry and gas and steam supply sector, the production volumes decreased by 4.6% and 3%, respectively (Fig. 2).

According to experts, the main restrictions on the development of the Tomsk oblast economy are infrastructure problems, the fact of reaching the limits of cheap raw material and labor, low efficiency of public administration, and the growth of barriers to business.

The main risks for the regional economy are: continuing stagnation in investment and production as well as in the income of the population, technological lag, and the growth of social and regional inequality.

Among the restrictions, cost of services of natural monopolies (reducing competitive advantages), management and training systems (reducing the efficiency of economic entities and labor productivity), and the outdated material and technical resources at enterprises in many sectors of the economy should also be noted:

In other words, in practice, an inertial scenario for the development of the regional economy, rather than an optimistic one is implemented.



\*SFD - Siberian federal district

**Figure 2** Industrial production Index

This analysis made it possible to conclude that the inertial scenario has a negative impact on the dynamics of the regional economic system. Under this scenario, the current model of economic development is preserved, manufacturing industries are becoming less competitive, and the dependence on imported goods and technologies is growing. In this case, the growth rate of GRP is likely to remain close to zero. Experts believe that under the current conditions, the inertial scenario is the most likely scenario for the socio-economic development of Russia and its regions in the medium term.

Under the inertial scenario, the productivity gap between most sectors of the economy and enterprises located in the region and the level of the best national and foreign producers will remain or even increase, which will result in the preservation or deterioration of the economic structure of the region towards the reduction of the share of high-tech industries. There will be no technical re-equipment or restructuring in agriculture and raw material industry. These industries will not be able to provide higher rates of economic growth compared to the existing ones.

Thus, it is obvious that the inertia of the economy acts as a negative property demonstrating insensitivity (unresponsiveness) to external controlling actions and measures taken by the government of the Russian Federation. Moreover, we are dealing with the inertia of dynamics with the direction of the economic system tilted to the downside.

The problem of overcoming the inertia of the economic recession based on the action of specific braking mechanisms of the economy lies in the development of an effective stabilization strategy that involves the formation of mechanisms to overcome the inertia of the economic recession and the control of disturbing factors.

## 5. CONCLUSION

The economy of Tomsk oblast is extremely inertial as in most other Russian regions.

This is due to the characteristics of the production factors operating in the region, the structure of production, the specificity of the infrastructure, the vast territory, as well as the features of economic structures inherited from the centralized system of economy.

A significant part of the inertial characteristics of the regional economy is defined by natural resources. This is exactly what determines the raw material orientation of the regional economy. The inertial characteristics have fixed assets — they are the characteristics of the industry structure and age composition. Their innovative orientation is insufficient, and there is persistent inertia of insufficient investment in fixed assets, especially in the active part.

The regional economy is also characterized by the inertia of the personal factor of production associated with demographic processes. The personal factor of production in Russia is inactive, and its movements are often caused by force-majeure political and economic circumstances. From the employment side, the main inertial characteristic of the transition economy is stagnant unemployment in economically degraded regions. The qualitative characteristics of the personal factor involve the inertia of deterioration of health, social well-being, and qualification training. High educational characteristics are maintained due to the inertia of the education sector.

Manifestations of economic inertia are diverse. The degree of success and adequacy of an economic policy depends on the extent to which it takes into account the inertia of the economic system and its constituent elements.

It is clear that the topic of economic inertia should be further developed. The creation of a measuring element, an indicator of economic inertia, appears to be essential and promising in terms of improving the control over the economy during the stagnation and recession periods since it is important to have quantitative estimates. This would allow taking economic inertia into account in the current economic policy.

The study of inertia in public institutions and within the system of social needs, inertia in the expression of economic laws and consistent patterns, inertia in corporate structures, inertia of globalization and international economic relations, and much more appear to be very promising.

## REFERENCES

- [1] Problem of preservation and the principle of inertia. Bulletin. Volume 128. Riga. Publishing house of University of Latvia. 1970. 244 p.
- [2] Mill J. S. Principles of political economy with some of their application to social philosophy. Book 2. Distribution, M.: Progress, 1980, 316 p.
- [3] Seligman B. Main Currents of Modern Economics, Progress, 1968
- [4] Baklanov P. Ya. Dynamic space systems of industry, Theoretical analysis. M.: Nauka, 1978. 132 p.
- [5] Zhuravsky M. Yu., Zhuravsky Yu. A. Regarding the factor of inertia in forecasting socio-economic development), Uncertainty principle and the forecast of th development of socio-economic systems, Tomsk, 1999.
- [6] Brockhaus and Efron Encyclopedic Dictionary (in 86 volumes with illustrations and supplementary materials)/ <http://www.vehi.net/brokgauz/>
- [7] Sidnina V. L. Economic inertia: the essence and the problems of measurement, Economics of the region development: problems, searches, prospects. Yearbook. Vol. 3. Volgograd: Publishing house of Volgograd State University, 2003. 522 p.
- [8] AfonasoVA M. A. The role of negative feedback in the inertial development of regional economic systems, Proceedings of the international scientific conference «Issues of modern economics and management: fresh perspective and new solutions.» – Yekaterinburg, 2016. PP. 189–191
- [9] Foreign investment flow to Russia have plummeted to the lowest level in 10 years.: <https://yandex.ru/turbo?text=https%3A%2F%2Fwww.forbes.ru> (Date of reference 02.02.2020).
- [10] Dynamics and structure of Russia's GDP. Bulletin on current trends in the Russian economy URL: <https://ac.gov.ru/files/publication/a/21974.pdf> (Date of reference 14.02.2020).
- [11] Sidnina V. L. Manifestations of inertia in the socio-economic system, Vestnik OSU, 2002. No 2. P. 150.
- [12] AfonasoVA M. A., Bogomolova A. V., Smirnova S. V. Problems of overcoming the inertia of the economic recession in the region – Tomsk: Publishing house of Tomsk State University of Control Systems and Radioelectronics, 2016, 116 p.
- [13] Strategy of socio-economic development of Tomsk oblast until 2030 URL: <https://tomsk.gov.ru/ctratigija-sotsialno-ekonomicheskogo-razvitija-tomskoj-oblasti-do-2030-goda>