O. A. Romanova

CONDITIONS AND FACTORS OF STRUCTURAL MODERNIZATION OF A REGIONAL INDUSTRIAL SYSTEM[1]

This paper suggests the concept of a «new industrial system»; a special features analysis of industry subjects' structure in Russian Federation within the Ural Federal District is done. Peculiarities of industrial policy in a cyclically developing economy are reviewed. Prerequisites for modernization of the industrial system and the necessary conditions for its implementation are disclosed.

Industrial system of economy largely determines its national identity, orientation on innovations, and susceptibility to the development of high-tech industries. There are different points of view on the understanding of the industry as a system. In particular, the industry of the world is reviewed as a «complex, hierarchically organized, polystructural system», as a «set of interrelated elements — production units of national states, transnational corporations, their affiliates and alliances». [6, p. 8] The global industry is in its basic properties has the qualities of a united system, although its global structure is morphologically broken. There are interpretations of the national industrial system as a «set of independent and (or) related sectors, including businesses, industrial associations on a particular territory». [12, p. 79] It is emphasized that the modern industrial system also includes infrastructural elements that create a base of industrial development, first of all, the elements of innovational infrastructure of state and regional significance, research divisions of corporate structures etc.

Such an interpretation looks somewhat narrowed and not stressed upon the fact that the industrial system is an open one; it's interacting with the environment, sociosphere and socio-political structure of the society. Industry of any country is influenced by both territorial and sectoral division of labour, under the influence of not only common, but regional trends and factors that finally determine its structural parameters. This paper considers only some aspects of the structural modernization of an industrial system associated with its polystructural composition. Structural properties as the system principle are the ability to describe the system through the characterization of its original structures, connections and relationships both outside and inside the system. The industry on different hierarchical levels, in this case at the regional level of a subject of Russian Federation, is characterized by such original structures such as sectoral, industrial-technological, institutional, social and spatial. In broad terms, structural modernization includes the advanced leading development on the innovational base of knowledge-intensive industries, service sector, infrastructural sectors with increasing socialization and humanization of the economy. To date, some of the structural features of the domestic industry became clearly evident such as narrowness of the segment generating competitive goods which are present on the world

[1] Russian Academy of Sciences' fundamental studies program «Economy and sociology of knowledge», project «Economy of knowlegde: institutions of regional development».

Table 1

The structure of shipped goods volume in the Ural Federal District, by kinds of economic activity, %

Kind of economic activity	UFD		by regions:							
			Sverdlovsk		Chelyabinsk		Tyumen		Kurgan	
	2005	2010	2005	2010	2005	2010	2005	2010	2005	2010
Mining / extraction	54,4	48,7	5,8	5,8	1,7	2,0	80,2	75,1	0,9	2,4
Manufacturing activity	38,8	42,7	83,7	81,5	90,5	89,1	14,6	17,9	74,9	73,7
Power generation and distribution	6,8	8,6	10,5	12,7	7,8	8,9	5,3	7,0	24,1	23,9

market as well as high concentration of employment in industries with low competitiveness and sustainably developing themselves only on the relatively closed markets. The tendency of sectoral structure of industry deterioration has increased; anomalous technological stratification is being conserved. This situation actualizes the need for structural upgrading of industry at both national and regional levels.

We should keep in mind that over the past 20 years sectors in the world economy expanded their borders by diversification into new kinds of products, revitalization of insourcing and outsourcing as well as cooperation with companies from other sectors. Such an extension is practically blurred the boundaries of sectors through the creation of sectoral economy for those that are closely related to each other. This situation predetermined the formation of a new concept for the development of processes aimed at improving the management of relationships between companies in context of globalization and formation of macroindustry as a united industrial system. This concept entitled «strategic redesign» or «strategic restructuring» can be successfully used as a basis not only for the actual identification of complex interactions between different types of production in domestic industry but also for a more precise formulation of a new industrial system concept.

The new industrial system, in our opinion, is an open system that includes a hierarchically organized sum-total of production units and infrastructure elements with qualitatively specified communications and interactions, with the ability to complex behavior and self-organization capability able to implement the potential of latest technological setup in the framework of modern techno-economic paradigm. The bases of this paradigm are the spheres of production and socio-economic relations in their interactions with the institutional environment of the society, defining a new set of fundamental principles that characterize the new phase of cyclical industry development. To date, the new industrial system of Russia and its regions is in its formative stages. The current set of the abovementioned connections and relations does neither eliminate abnormal technological multicultural character of the domestic industry nor accelerate the formation of a new, VI technological setup that actualizes the need for structural upgrading of industry at both national and regional levels.

The Ural Federal District (UFD) is one of the largest industrial regions in Russia which main economic activities are extraction of commercial minerals and manufacturing whose share in the structure of the shipped goods volume in 2010 amounted 48.7 and 42.7% respectively (Table 1).

A feature of manufacturing industry sectoral structure of Sverdlovsk and Chelyabinsk regions is the prevalence of basic industries — metallurgy and machinery construction — whose share in the shipped products volume in 2010 amounted 60.7% and 64.2% respectively. In the structure of manufacturing activity in these areas metallurgy is dominant; its specific weight in 2010 in Sverdlovsk region was at the level of 58.2% and 63.2% in Chelyabinsk.

The share in output of manufacturing activity in exports as well as in the balanced financial result of Sverdlovsk region's metallurgical complex is more than 3 times higher than the average Russian rates. This percentage is also significantly higher than those of the Ural Federal District (fig.). It may be noted that the share of metallurgical industry in general in the balanced financial result of Sverdlovsk region in 2010 amounted 34.6% and in the balanced financial result of the manufacturing activity sector — 65.8%.

The current crisis in the domestic economy was rather actively regulated by the state, which somehow reduced shocks to the population and banks but also reduced the potential for post-crisis recovery of the real sector of the economy. During the crisis period 1998-1999 the situation was opposite. Taking into account serious negative consequences for the population, there were no fundamentally important

obstacles to more rapid recovery of the industrial sector of the economy.

The predominance of manufacturing industries in the economy of Sverdlovsk and Chelyabinsk regions determined the lower indexes of industrial production in 2009 compared to 2008 (82.3% and 80.5% respectively) compared with the indexes of the Ural Federal District (92%) [10]. The year 2010 in Sverdlovsk and Chelyabinsk regions as well as on in the UFD and Russia in general was characterized by positive dynamics of economic development and the main contribution was made by industry. With an average growth over the whole range of enterprises in the UFD by 7%, the output in manufacturing rose by an average of 15%. The growth index of industrial production in 2010 in Russia in general was 108.9%, in Sverdlovsk region it reached 116.9%, in Chelyabinsk region — 112.1%.

Together with the positive dynamics of development we have to note the subsiding trend of recovery. Cumulative decline in industrial production output during the last crisis was 17%. The bottom was reached in February 2010, after that the recovery growth occurred in several waves. And if we remember that in 2009 the post-crisis development was initiated by export industries, especially metallurgy, in 2010 it was domestic consumer demand supported by wage-push and activating of consumer bank loans. The average monthly wage increased in Sverdlovsk region from 17.4 to 19.1 thousand rubles, in Chelyabinsk — from 14.9 to 17.1 thousand rubles, that can only partly testify the appearance of trend growth in the share of highly paid jobs. The flow of corporate profits tax in the consolidated budget of Sverdlovsk region increased from 17.2 in 2009 to 32.9 billion rubles in 2010, in Chelyabinsk from 3.3 to 17.5 billion rubles. Taxes on personal income rose in Sverdlovsk region from 42.7 to 45.7 billion rubles and in Chelyabinsk from 25.8 to 28.7 billion rubles. [13] The contribution of metallurgical production of Sverdlovsk and Chelyabinsk regions in the balanced financial result of manufacturing in these regions amounted to 72.3% while the balanced financial result for all activities amounted to 43.7%.

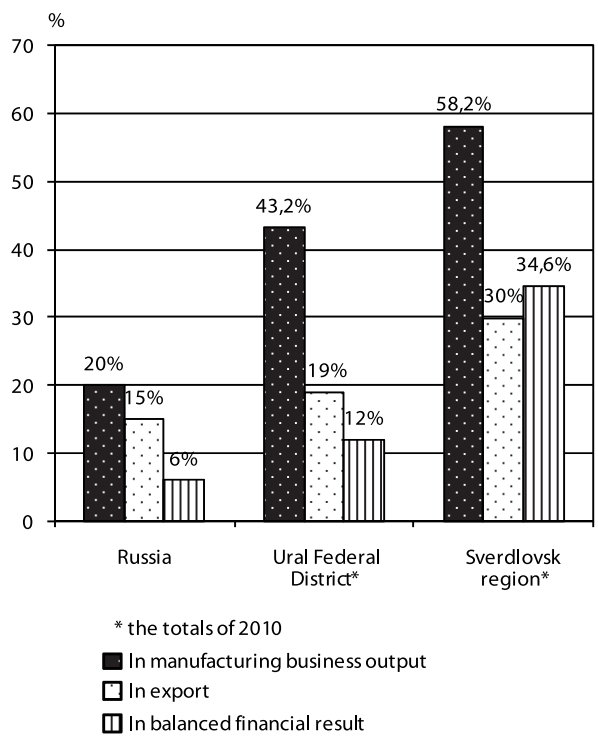

Fig. *The role of metallurgy in the economy of Russia and Russian regions (indicators showing the totals of 2010)*

However, despite some increase, these figures for 2010 have not reached the level of 2008. Thus, in Sverdlovsk region tax profits in 2010 amounted to 76.7% from the level of 2008, income tax on individuals — 94.2 %. In Chelyabinsk region the corresponding figures were 57.5 and 95.9% respectively. Exports of major commodities from Sverdlovsk region in 2010 totaled about 8.6 billion USD and 3.1 billion USD of imports [16]. In this case, more than 30% of exported goods amounted to semi-finished carbon steel, refined copper and raw copper alloys, raw aluminum, titanium and its products including waste.

Positive results in economic development both of Russian Federation subjects and Russia in general in 2010 were the result of economic model implementation of growth-oriented demand, but the modernization component which is present in a systemic crisis, was unused. Economic growth by itself is not an evidence of the modernization processes implementation. It is important in today's terms that we proceed with the formation of a new growth model on a state-level and quality improvement of that growth which can enhance competitiveness of industry in the region and implementation of major economic, organizational and technological solutions. Only on this basis it is possible to emerge a new industrial system based on a new quality of growth while the problem of increasing the pace of industrial development becomes secondary in this case.

The determining factor in shaping the new industrial system is industrial policy, which must be inevitably transformed from state policy into national industrial policy i.e. a policy governing the system of relations between authorities, business, science and society regarding the change in cross-

sectoral proportions and forming a structurally balanced, competitive economy. Such a policy is developing strategic orientation towards progressive change in the industrial structure and realizing the national priorities and should take into account the specific features and capabilities of the Russian Federation subjects. The understanding of industrial policy as an integral part of structural policy of the state seems rather questionable [3, p. 108]. In our view, the role of industrial policy as a factor for systemic economy modernization at different stages of industrial systems life cycle is different. In periods between structural crises, industrial policy encourages reproduction of existing industrial system and its basic structural proportions what does not in principle distinguish such a policy from the direction of economic policy in general.

During the period of structural adjustment, industrial policy in terms of aim, subject, object, methods and mechanisms for implementation is getting structural. In a cyclically expanding economy emerging from the structural crisis the industrial policy promotes the establishment of a new industrial system, at the stage of economic growth — it promotes further development and strengthening , at the stage of stabilization it is aimed at encouraging the implementation of the established potential [14]. Thus, depending on the stage of the next economic development cycle, industrial policy either provides support for the existing industrial system or stimulates the formation of a new type of industrial system, the basis of which is to create innovation-oriented, structurally balanced high-tech industry successfully competing in world markets, providing security of the country and a high standard of living of the population.

Formation of such industry would only be possible with well-timed implementation of its modernization, which involves not only the efficient update process of the real economy sector but also coordinated qualitative changes in the entire system of social relations in accordance with the requirements of time. The effectiveness of the state here is of particular importance as the main instrument for implementing the modernization of the country as a whole with the synchronous implementation of the three interdependent areas: preparation of the politico-legal, economic, technological and social prerequisites for modernization, radical innovational modernization of the existing material production and the existing infrastructure, creating fundamentally new areas of activities.

From this perspective, the effectiveness of Russian government is rather low and prevents active industrial modernization. As a particular example we can note that in Russian economy, according to E. Nabiullina, the state procurement system is one of the biggest areas of inefficiency. Relevant ministries can make purchases if costs are lowered by 15% or more. Full transparency and efficiency in procurement of natural monopolies is of special importance, which are comparable in terms of procurement of the state [8]. But overall inefficiency of the state from the perspective of system modernization and the formation of a knowledge economy is defined by the fact that Russia is weak in function of the strategic economy management, intensification of sectoral and regional imbalances is unsustainable; new conceptions of the relationship between the role of economic and social factors in public administration are not implemented in the proper degree; the role of expert examination of the decisions is underestimated, the optimum ratio of group and national interests in government policy is absent, corruption potential of the management system remains the backbone of its quality [18].

At present, both in Russia and in its separate regions the work to reduce the inefficiency of state activity, including through increased attention to strategies for socio-economic development of territories, reducing corruption etc. is activated. So, in the Ural Federal District the legislation to counter the penetration of criminal elements into state power, the inefficient ownership etc. was drafted. However, it should be noted that conceptual concerns that have led to inefficiency of the Russian state in the implementation of modernization continue to exist. First of all, this comes from the simplified understanding of the government role in the modern world. In the second half of XX century the idea of a new conceptual paradigm, so called NPM (new public management) prevailed which fundamentally changed views on the state. Earlier, «the state was seen as a center of the world reason concentration, but according to a new paradigm the service approach to understanding the state has prevailed, the state was reviewed as an organization focused on providing services to citizens» [7, p. 54].

In developed economies such format of the state is successful. The strategic functions of the state apparatus and the function of providing services are transferred to the commercial sector and to the institutions of civil society. This division of responsibilities between state and society has been formed due

to reasonable ability and willingness of the commercial sector and the institutions of civil society to take on a number of functions which formerly were a state monopoly. However, what has been effective in highly developed countries, has not produced the desired effect in developing countries, including Russia. The main reason for unacceptable of this state format in today's Russia is that the underlying ideology of service approach to understanding the state does not correspond to the tasks of modernization. In addition, we cannot agree with an opinion that the «administrative selection of loyal staff, informal practices cannot bear political leaders who can make a modernization breakthrough» [7, p. 29]. Overall, the evaluation system of public administration from the standpoint of its possible implementation of the modernization processes indicates that Russia has demonstrated a weak sensitivity to the spreading in the most developed part of the world «activating state» model.

A significant obstacle to the implementation of industry modernization at the regional level is the vertical displacement of regional elites by the state authority from the federal political process . This has influenced the change both in political and hence economic strategies of regional elites themselves whose behavior is based on the implementation priority of the federal units and solving primarily not strategic but tactical objectives. As a result, economic growth potential which was put in the rational structure of the state is lost and we observe a significantly reduced risk and finding new prospects motivation contributing to the phenomenon of short goals in the regional elite [2, p. 56]. The results of Yury Levada research center on instruments of influence to take the necessary decisions show that over 65% of vice-governors, 70% of senior executive power officials, 69% of legislative power officials, 76% of CEOs of large and medium-sized businesses consider proximity to the Russian President and his administration to be the main lever of influence on taking the necessary decisions; according to the same categories of respondents, they estimate the significance of such factors as the need for reforms and the ability to implement them at the level of 13, 12, 10 and 2% respectively [4, p. 327].

The quality of human capital which development is the exclusive prerogative of the state has become a key condition, a precondition and a factor in creating a modern industrial system in the emerging knowledge economy. This circumstance predetermined considerable investments in human capital carried out by the successful economies of the world. At the same time in Russia the underestimation of the advanced features, which performance always lies on the state, has become clearly apparent.

Nowadays the government intensifies the policy realizing the imperative of transition to innovative development and usage of a wide range of selective industrial policy methods proven in the world practice which support high-tech, innovation-intensive businesses and organizations. Among them, systemically important companies, technology platforms, cluster policy and improving the investment climate are most important for the modernization of the Ural industrial system.

Systemically important companies. Industrial Policy of the European countries and the United States is largely based on the development of national systemically important companies-industries and strengthening their position in the global high-tech market [1]. The positive experience of creating systemically important companies in the domestic economy is already there. Criteria for their selection are formed from the position of national security (parent organizations of military-industrial complex), economic stability (organizations on the last place in the technological chain, key exporters, key import substitutes and firms with high market share) and social stability (suppliers of goods and services, city-forming organizations, major employers, major taxpayers in the region). The group of Chelyabinsk Tube Rolling Plant (ChelPipe) became a systemically important metallurgical company in the Urals in 2008. In 2010, two largest investment projects have been implemented with the state help — a new plant for large diameter pipes production at the site of ChelPipe and a new mini-mill on the site of Pervouralsky Novotrubny Works. This complex will be one of the most high-performance systems in Europe and the absolute leader among Russian metallurgical enterprises in the output of steel per worker in compliance with all environmental requirements for both domestic and European legislation.

Technological platforms. Significant role in the systemic technological modernization of Russia and its major industrial regions may play the formation of technological platforms. The concept of technological platforms as a defined beliefs system to overcome the failures of both market and state, began to develop actively in Russia. In Europe, the formation of technological platforms, the so-called European

Technological Platforms (ETP) designed to bring together key industry businesses, financial institutions, governments, scientific and civil societies began already in 2001. ETP ideology was officially formalized in a document issued by the European Union entitled «Industrial Policy in an Enlarged Europe». To date, ETPs were approved; some of these have moved to a higher level and achieved a status of joint technological initiatives [9].

In Russia in 2010, the Government Commission on High Technologies and Innovation approved the procedure of forming a technological platforms list and also established a workgroup to develop public-private partnerships in innovation area. These technological platforms are designed to gain leadership in high technology sectors, to develop new technologies for radical changes in the structural proportions of industry and to upgrade traditional industries. Ministry of Economic Development received more than 170 projects eligible for inclusion in the technological platforms list. During 2011 it is planned to create about 30 technological platforms that will bring business, science and government together in order to solve first-priority technological problems. In the field of metallurgy, which is of particular relevance to the Ural Federal District, two all-Russian platforms were announced; one of these platforms is associated with polymer composite materials, the other one with creation of new materials and industrial metallurgical technologies [8]. The State Atomic Energy Corporation «Rosatom» published the draft of a technological platform called «Rare-earth metals».

We cannot ignore that the practical implementation of technological platforms is a rather complex process that depends on the quality of corporate and public governance. Traditionally in Russia the state is the main sponsor and owner in the area of science, technology and innovation, is yet sufficiently weak at realizing the function of a network interactions moderator. But the development of the domestic economy is a subject to the successful implementation of technological platforms, it would modernize the existing production and form a new sector of Russian industry, expand scientific and industrial cooperation, create a new partnership in the area of innovation that will contribute to the formation of a new industrial system in Russia and its regions.

Cluster policy. The formation of clusters is one of today's most important factors for regional development and the defining instrument of establishing a new industrial system. In the regions of the Russian Federation there have been numerous suggestions about the possibility of creating regional clusters. Thus in Sverdlovsk region there are real prerequisites for the formation of such clusters as the pharmaceutical, chemical, machine building, instrument etc. and this process was already initiated. Creation of powerful rare-earth clusters is of special importance for the Ural region and for the country as a whole [17, p. 5]. Large proven reserves of rare metal ores, large amounts of complex man-made materials, including thorium monocyte concentrate reserves, copper smelters slime, red slime of aluminum plants etc. are concentrated In the Urals. There are businesses on the territory of the Urals that can participate in the processing of production induced feedstock and here are many consumers of rare-earth products, significant research and design organizations as well as specialized departments of higher education institutions which may form the basis for training of qualified personnel for processing rare and rare-earth metals. The importance of creating such a cluster is difficult to overestimate because rare-earth metals largely determine the possibility of modern high-tech industries development and define the possibility to create fundamentally new and innovative areas of activity.

Improvement of the investment climate. Subjects of the Russian Federation included in the Ural Federal District, in particular, Khanty-Mansi and Yamalo-Nenets Autonomous districts, Sverdlovsk and Chelyabinsk regions, are in the top twenty regions where investments in gross fixed capital are made. Their total share is about 18% of that of the Russian Federation in general. Investments made in the gross fixed capital of Sverdlovsk region are about 3% of all Russian, Chelyabinsk region — around 2%. In the Urals major long-term investment projects are being implemented. As an example, we mention the projects in Sverdlovsk region. Nine of top ten innovative projects in the region are carried out in mining and metallurgical complex (Table 2). Today metallurgy of the Urals is actively modernized. The open-hearth production was completely eliminated, the output of products of high added values increased significantly. TMK has become one of the world's leading companies for the production of oil industry pipes.

Continued modernization of Ural metallurgy and successful implementation of investment projects will largely depend on improving the investment climate in both regions of the Ural Federal District and in Russia in general. With this purpose in 2011

Table 2

The largest projects of Sverdlovsk region in ore mining and smelting complex (2010)*

Enterprise	Business segment	Owner	Volume of investments, millions of rubles
Pervouralsky Novotrubny Works	Pipes production	Pervouralsky Novotrubny Works Group	7697
Seversky Pipe Plant		TMK	1600
Sinarsky Pipe Plant		TMK	560
VSMPO-AVISMA	Ferrous and nonferrous metallurgy	«Russian Technologies State Corporation»	4855
Nizhniy Tagil Iron and Steel Works (NTMK)	Ferrous metallurgy	«EVRAZ Group»	3806
«VIZ-Steel / VIZ-Stal Ltd.»		Novolipetsk NLMK	610
Nizhneserginsky Metallurgical Plant		Novolipetsk NLMK	300
Uralelectromed	Nonferrous metallurgy	UMMC	1000
North Urals Bauxite Mine	Добыча бокситов	UC RUSAL	226

* Compiled by the author on the basis of data in «Business Ural» magazine (№12, 2011)

in each federal district a special authorized investment institution is introduced. A special place in this work will be occupied by the interaction between investors and executive authorities. In the same year a Russian equity fund will be created in order to attract foreign direct investments [5]. This fund is designed to co-finance the investments by foreign funds into major companies in the significant (for the Russian economy) investment projects. The state will not participate in management of such funds and will ensure the withdrawal of the capital in a period of less than 10 years. This fund will be established by Bank for Development and Foreign Economic Affairs (Vnesheconombank) with initial volume of not less than 2 billion USD and then augmenting this amount to 10 billion USD. The fund's share in all projects will range from 10 to 25%. The task posed to the fund management team is to attract new investments exceeding the fund size not less than by 5 times [5].

As we already noted above, the modernization process has a focused and driven character. Therefore, the measures can be interpreted as activities or arrangements designed to make the government more efficient, to reduce obstacles to the modernization implementation related to the law violation, high bureaucratic barriers, lack of Russian citizens' support of the modernization processes. However, to take such systemic measures there is need for legislative support of an active industrial policy eliminating structural imbalances that encourage modernization of traditional industries, creating new sectors and high-tech industries. The absence of a federal law on industrial policy in Russia has forced the federation's regions to develop their own regional laws with the same title. Our analysis of more than 40 such laws disclosed that these papers declare conflicting objectives, principles and mechanisms of implementation, are designed for short terms and often do not correspond with national priorities for industrial development [11].

The absence of basic law on industrial policy has predetermined the appearance, for example, of such local laws in Sverdlovsk region like the laws «On state support of innovation activities in Sverdlovsk region», «State support of investment activity in Sverdlovsk region», both should actually be separate blocks in within the basic law on industrial policy. A number of regional laws projects were published: the law «On the industrial park in Sverdlovsk region», «On participation of Sverdlovsk region in the public-private partnership» and a draft law on regional cluster policy. Of course, these drafts are aimed at institutional development of the modernization area but at the same time they regulate only some aspects of regional industrial policy implementation.

There is a need not only for an officially voiced but also legislatively fixed ideology in industrial policy at both federal and regional levels; that will be a determining factor in formation of a new industrial system. The Institute of Economics (the Ural Branch of Russian Academy of Sciences) together with the Ministry of Industry and Science of Sverdlovsk region developed a federal law draft «On the regional industrial policy in Russia» which is a model law [13]. It focuses on national priorities, building a new industrial system, achieving an optimal leverage ratio of direct impact snd economic

incentives which create favorable conditions for organizations and companies realizing modernization and innovation projects. Considerable attention in this law shall be given to the orientation not only on high-tech sectors but also on the modernization of basic low-tech industries. Particular attention and importance is attracted to regional perspectives and resource capabilities, coordination of activities on hierarchical levels, consistency of industrial policy mechanisms implementing the principles of public-private partnerships, cluster development, project restructuring and modernization of existing production. A separate article of the law is devoted to establishing a regular monitoring system to assess the effectiveness of measures and timely adjustment of managerial decisions.

Industrial policy based on a single legislative framework in the presence of «external» modernization conditions (political will of the country's leaders, active participation of the core ruling elite in its implementation, necessary knowledge and new management solutions, lack of corruption and bureaucratic barriers etc.) will be a major structural modernization factor of the regional industrial system.

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