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Kirdina, Svetlana

Institute of Economics RAS

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Svetlana Kirdina
Institute of Economics, Russian Academy of Sciences
Moscow, Russia
kirdina@inecon.ru, kirdina@bk.ru

Prospects of Liberalization for S&T Policies in Russia: Institutional Analysis¹

Abstract:

The objective of the paper is to define the trajectory of economic institutional reforms in Russia as a framework of S&T policies. The methodology of this research is based upon *the institutional matrices theory* (Кирдина, 2001; Kirdina, 2003). The hypothesis claims that the “institutional nature” of Russia defines its prospects of liberalization and needs the active implementation of liberal market institutions policy only within a framework of modernization of redistributive state economic system. Modern S&T policy in Russia demonstrates the implications of such kind of development. The new institutional form of *State Corporation* that is non-profit organization under government regulation has been widely developed for last 3 years. The main sphere of State Corporations activity is high-tech development. The share of State Corporations in the state budget is more than 20% and it is constantly increasing.

Introduction

The essence and prospects of national S&T policy in modern Russia can be considered in the context of the institutional liberalization process. The institutional liberalization is defined in this paper as the development and implementation of liberal institutions in economic, political and ideological spheres of the society. What kind of institutions are they? We will use the methodology, based upon *the institutional matrices theory*, or *X- and Y-theory* (Kirdina, 2001, 2003 etc)

1. The Institutional Matrices Theory (the IMT), or X- and Y-theory

The main theses of the IMT (or X- and Y-theory) are presented in the paragraph. This theory regards the society as a structured whole with three main spheres – economy, politics and ideology, which are morphologically interconnected. Thus social relations forming the inherent structure include the following:

- economic interrelations related to resources used for the reproduction of social entities;
- political, i.e. regular and organized social actions to achieve the defined objectives; and

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- ideological interrelations embodying important social ideas and values.

Each sphere is regulated by a corresponding set of basic institutions. These basic institutions are the subject of the analysis. Institutions permanently reproduce the staples of social relations in different civilizations and historical periods. Basic institutions integrate a society into one ‘whole’ that is developing, sometimes with conflicts and at other times with harmony, sometimes with competition and at other times with cooperation.

Institutions have a dual natural-artificial character. On the one hand, institutions manifest self-organizational principles in a society as a co-extensive natural-social system. On the other hand, institutions are the result of purposeful human reflection with regard to relevant laws and rules; they emerge and are shaped as ‘human-made’ entities. Aggregations of interrelated basic economic, political and ideological institutions are defined as *institutional matrices*. Historical observations and empirical research as well as mathematical modelling and a broad philosophical approach provide a ground for our hypothesis about two particular types of institutional matrices existing around the world. Namely, we call the two types X-matrices and Y-matrices and compare the unique identities of each one. These matrices differ in a set of basic institutions forming them (see Image 1).

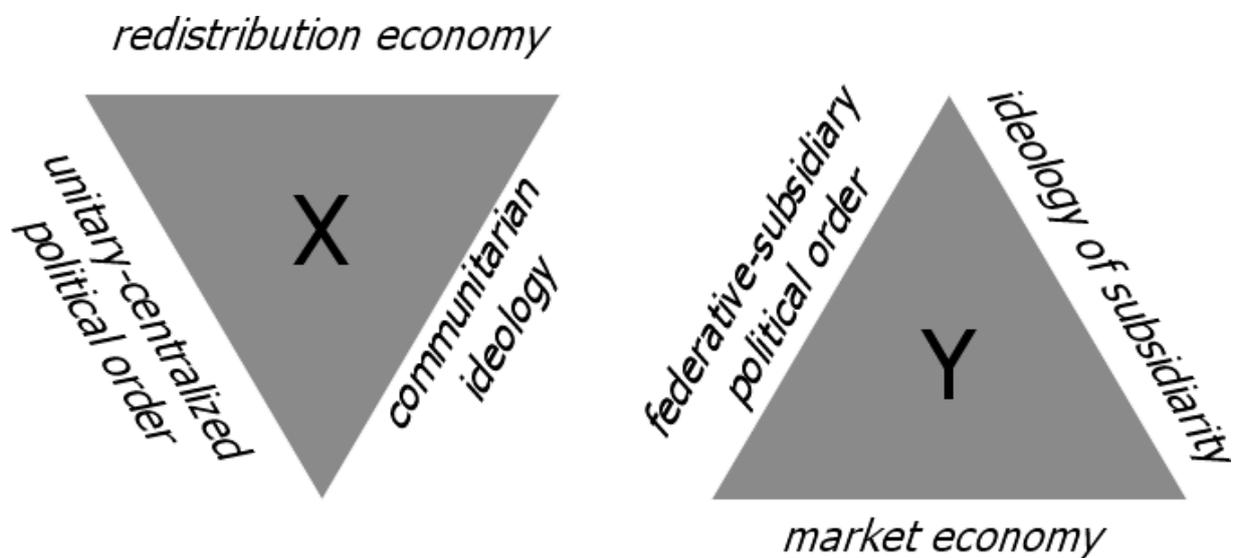


Image 1. Institutions of X- and Y- matrices.

An X-matrix is characterized by the following basic institutions:

- in the economic sphere: *redistributive economy institutions* (term introduced by Karl Polanyi, 1977). Redistributive economies are characterized by the situation when the center regulates the movement of goods and services, as well as the rights for their production and use;
- in the political sphere: *institutions of unitary (unitary-centralized) political order*;
- in the ideological sphere: *institutions of communitarian ideology*, the essence of which is expressed by the idea of dominance of collective, public values over individual ones, the priority of We over I.

The following basic institutions belong to the Y-matrix:

- in the economic sphere: *institutions of market economy*;
- in the political sphere: *institutions of federative (federative-subsidary) political order*;
- in the ideological sphere: *institutions of the ideology of subsidiarity* which proclaims the dominance of individual values over the values of larger communities, the latter bearing a subsidiary, subordinating character to the personality, i.e. the priority of I over We.

In real-life societies and nations, X- and Y-matrices interact, with one of them permanently prevailing. Nevertheless, the matrices are not entirely exclusive of each other, given that both X- and Y-matrices co-exist concurrently in a given case. The other words, the social structure of any society can be singled out as a dynamic binary-conjugate structure of these two interacting, yet alternative institutional complexes. The domination of one of the matrices over the other is constant in the course of history. The dominant institutions of the prevailing matrix therefore define society and serve as a performance framework for complementary institutions from the other matrix (see Image 2).

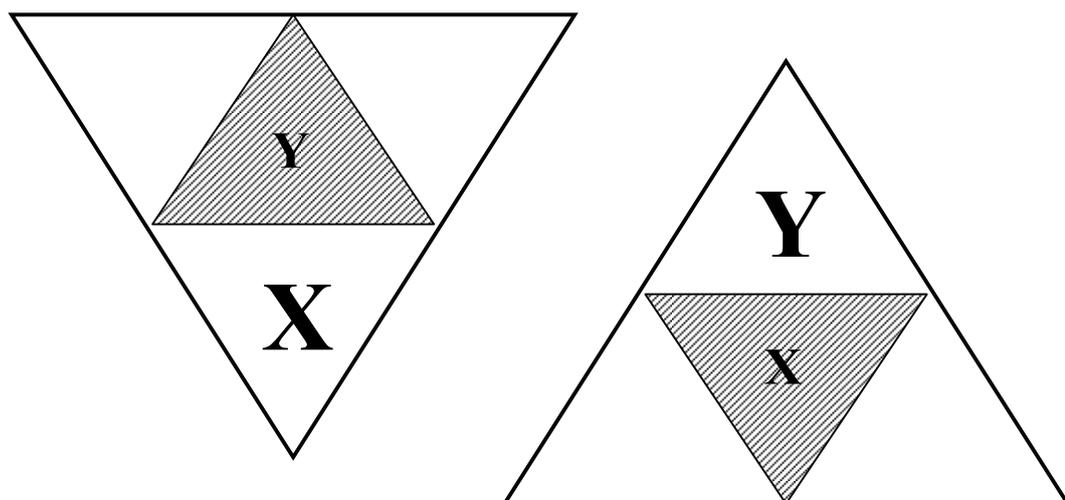


Image 2. Balances of dominant and complementary institutional matrices.

We contend that X-matrix institutions are predominant in Russia, China, and India, along with most Asian and Latin American countries. In this case Y-matrix institutions are “a must” but they have the complementary and additional nature. And controversy - Y-matrix institutions are prevailing in the public order of most European countries and the USA, whereas X-matrix institutions are additional.

Structures and functions of basic institutions in X- and Y-matrices are presented in Tables 1-3. First of all we consider economic institutions (Table 1).

Table 1. Economic institutions

Functions of institutions	Institutions of redistributive economy in X-matrix	Institutions of market economy in Y-matrix
Fixing of goods (property rights system)	Supreme conditional ownership	Private ownership
Transfer of goods	Redistribution (accumulation-coordination-distribution)	Exchange (buying-selling)
Interactions between economic agents	Cooperation	Competition
Labor system	Employment (unlimited-term) labor	Contract (short- and medium-term) labor
Feed-back (effectiveness indices)	Cost limitation (X-efficiency)	Profit maximization (Y- efficiency)

We can see that the same economic functions are enacted by specific institutions in different matrices. Complexes of redistributive institutions (X-matrix) and market institutions (Y-matrix) are the main subject of our research, which is why they are given special attention.

The property rights system in a nation or community ensures the basis for stable relations between economic agents. The structure of property rights secures the order of resources procured from the nature, and prepares the way for production and the subsequent delivery of goods to people for their subsistence and development.

Supreme conditioned ownership (X-matrix institutions) is specific in that the rules of access for the use of *some* objects in production and consumption are conditioned in the final case by the ‘supreme’ (which in Russian means ‘from above’) level of economic hierarchy. These rules change over time and depend on external circumstances. The supreme hierarchical level of governance determines rights of access in accordance with the public role and importance of given resources at each historical moment. The Supreme level of management sets frameworks for forming property rights for ‘subordinate’ regional and local levels, which regulate the relations of property in corresponding territories. Due to the existence of supreme conditioned ownership, the property configuration is permanently changing, but the role of the administrative hierarchy with a national center as the principal regulator of ownership or property rights is constantly preserved. If the objects belonging to any economic agent do not assure an essential contribution to total productivity or if they are not used for public benefit, then they can be legally seized and returned to public ownership or transferred to other productive economic agents. The institution of supreme conditional ownership assumes the formation of corresponding hierarchical economic structures of management in the jurisdictional territory of the state.

Private ownership (Y-matrix institutions) means that society sanctions all property rights (including the possession, disposal and use of objects) to individual or collective economic agents.

Transfer of goods within the respective property rights framework is regulated by redistribution or exchange. **Redistribution** (X-matrix institution) describes the transfer process of material goods and services (and also property rights) not between entirely independent agents, but between agents and the center as their mediator. Historically, a redistribution framework is an institution that emerges in nations where the majority of economic agents depend on significant common resources (e.g. water, fertile land, rivers, roads, staple goods, etc). Such resources can be called ‘public goods.’ In such cases, it is necessary to coordinate transactions not only between two autonomous interactive agents, but also between other dependent economic agents that can be involved explicitly or implicitly. The motivation to minimize transaction costs leads to the creation of one special center responsible for institutional coordination. All necessary information is accumulated in this center, which the agents access.

The rules and order for using public goods are defined there. Appropriate resources are also concentrated in this center to support its coordinative functions.

The redistribution model thus involves three transaction participants, namely, a pair of economic agents and the center as their mediator. Redistribution means a permanent process with three basic phases: 1) *accumulation* (collection and storage of resources and goods), 2) *coordination* (concentrated in the center), and 3) *distribution* (resources, goods and property rights).

Exchange (Y-matrix institution) means horizontal interactions between independent economic agents, primarily with the goal of gaining profit in a market economy².

Since exchange (market) and redistribution (centralisation) are fundamental peculiarities of different economic systems, economies with predominating X-institutions can be rightfully named ‘redistributive economies’ (following Karl Polanyi, 1977), or ‘centralised economies,’ whereas the economies with prevailing Y-institutions can be named ‘exchange or market economies.’

Institutions of cooperation and institutions of competition regulate the interactions between economic agents. **Cooperation** (X-matrix institution) establishes itself as a definitive institution if joining economic actors for common tasks involving a nation’s or community’s resources in the economy is more productive than restricting resources to use by separate, autonomous agents. The most known form of cooperation are rural communities in different countries of the world, that is, agricultural, industrial and trading cooperatives, **(friendly) credit companies**, etc. Accordingly, **Competition** (Y-matrix institution) stimulates the possession of limited resources by individuals when personal benefit is gained from owning (part of the) material resources, the technological environment and other means of production. There are many different models of competition in market economies, for instance “monopolistic competition” (Chamberlin, 1956) or “imperfect competition” (Robinson, 1948) etc.

²"As far as it goes about market economy, for fundamental theory it makes no difference what kind of market economy it is: a system of primitive exchange between hunters and fishermen or a complex organism that we can see today. The main features, contours are entirely the same, and even the way in which national economic accounts are kept - with or without money - makes no difference. We have already noticed that money circulation in such an economy is no more than an auxiliary technical tool that changes almost nothing. No matter how different is modern economy from primitive, mostly the same occurs in both" (Schumpeter, 1926:74).

What institutions regulate the labour relations in X- and Y-economic systems? **Employment (unlimited-term) labour** institution (X-matrix) means the necessity of obligatory employment and forming public guarantees of attracting the able-bodied population to work. The Japanese phenomenon of "lifelong hiring", for example, reflects the actions of this institution. Thus, the sphere of work also realizes the laws of redistribution, assuming the accumulation-coordination-distribution of manpower (human resources) with the corresponding information, as K. Polanyi noted (Polanyi, 1977:36). The essence of the **Contract (short- and medium-term) labour** institution (Y-matrix) is that labour relations are mainly in the sphere of mutual relations between the employer and the worker and have a character of hiring for a certain limited time according to a contract. "Normal" unemployment is a necessary attribute of such a system of labour relations. In the sphere of work, as with X-economies, the institutional laws define their character, in this case, the market character, and, as Karl Marx wrote (Marx), labour-power becomes a commodity that is bought and sold on the market.

Those institutions that function with feedback signals also perform in economic systems. Without competition, the efficiency of the redistributive economy can be achieved only at the centralised control of cost in each segment and in the economy as a whole. H. Leibenstein called this phenomenon X-efficiency (Leibenstein, 1966, 1978). Restraint of costs is carried out by means of normalizing expenses, price controls, tariffs and other measures with the purpose of raising economic efficiency. **X-efficiency (Cost limitation)** institutions (X-matrix) serve as feedback loops to central authorities. **Y-efficiency (Profit maximization)** institutions (Y-matrix) identify the priority of profitability, or growing producer and consumer surpluses (Mankiw, 1998).

All X- and Y-institutions coexist in actual national and local economies in different combinations and are embodied in many institutional forms. Thus, though we are outlining the general features of X- and Y-matrix economic institutions, in real-life situations the extreme cases are never fully demonstrated this way.

The basic political institutions in the X- and Y-matrices are presented in Table 2.

Table 2. Political institutions

Functions of institutions	Institutions of unitary political	Institutions federative political
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	order in X-matrix	order in Y- matrix
Territorial administrative organization of the nation	Administrative division (unitarity)	Federative structure (federation)
Governance system (flow of decision making)	Vertical hierarchical authority with Center on the top	Self-government and subsidiarity
Type of interaction in the order of decision making	General assembly and unanimity	Multi-party system and democratic majority
Filling of governing positions	Appointment	Election
Feed-back	Appeals to higher levels of hierarchical authority	Law suits

We distinguish 5 basic economic and political institutions in each matrix. Also, we consider 3 pairs of ideological institutions in X- and Y-matrices (Table 3).

Table 3. Ideological institutions

Functions of institutions	Institutions of communitarian ideology in X-matrix	Institutions of subsidiary ideology in Y-matrix
Driver of social actions	Collectivism	Individualism
Normative understanding of social structure	Egalitarianism	Stratification
Prevailing social values	Order	Freedom

For a fuller description of political and ideological institutions in details see (Кирдина, 2001:123-183). Normal functioning of X- and Y-matrices requires an appropriate institutional set with all morphologically interconnected institutions. For example, **supreme conditioned**

ownership cannot act perfectly without X-efficiency (cost limitation) institutions and other institutions from the X-matrix institutional set. For the Y-matrix the same is true.

The material and technological environment in a society is a key historical determinant of whether either an X-matrix or a Y-matrix prevails, along with culture and personality. The environment can be a *communal* indivisible system, wherein removal of some elements can lead to disintegration of the whole system or it can be *non-communal* with possibilities of functional technological dissociation (Bessonova, Kirdina, O'Sullivan, 1996:17-18).

Communality denotes the feature of material and technological environment that assumes it exists as a unified, further indivisible system, parts of which cannot be taken out without threatening its disintegration. A communal environment can function only in the form of public goods and cannot be divided into consumption units and sold (consumed) by parts. Accordingly, joint, coordinated efforts by a considerable part of the population, along with a unified centralized government are needed. Therefore, the institutional content of a nation developing within a communal environment is, eventually, determined by the tasks of coordinating joint efforts towards effective use. Thus, X-matrices are formed under communal conditions.

Non-communality signifies technological dissociation, with the possibility of atomizing core elements of the material infrastructure, as well as independent functioning and private usage. A non-communal environment is divisible into separate, disconnected elements; it is able to disperse and can exist as an aggregate of dissociated, independent technological objects. In this case, an individual or groups of people (e.g. families) can involve parts of the non-communal environment in their economy, maintain their effectiveness, and use the obtained results on their own, without cooperating with other members of the society. If this is the case, the main function of such formed social institutions is to assure an interaction between the atomized economic and social agents. Y-matrix institutions are thus shaped in a non-communal environment.

To be more accurate, in a communal environment X-matrix institutions are dominant and Y-matrix institutions are complementary (e.g. in Russia, China, India and most Asian and Latin American countries). In a non-communal environment (e.g. in the USA and Europe) the institutional situation is *vice versa*.

The ratio of dominant and complementary institutions is defined by the changing conditions of social-economic development. On one extreme, there is a totality of dominant institutions without conscious implementation of complementary institutions. This tends to result

in collapse (e.g. USSR's breakdown in the '80s and '90s) or in a social and economic crisis (e.g. the U.S.'s recent '07-'09 recession). The opposite extreme implies the attempt to replace historically dominant institutions with complementary ones. This move leads to revolutions through reconstructing dominant institutions into new forms (e.g. the French Revolution as a reaction to economic and political centralization and, alternatively, the Russian October Revolution as an outcome of an attempt at "building capitalism") or unsustainable socio-economic development (e.g. some Latin American countries).

We know that neoclassical, post-classical and neo-institutional theories have stated the claim of an inevitable domination of the market (exchange) type of economy. According to these theories, redistributive models are complementary and manifest themselves in governmental activities through monopoly regulation, correction of externalities, production of public goods and other actions to overcome market failures. This inevitability is still believed by some economists, especially those from western countries.

But from our point of view, an alternative situation is appropriate for some countries, including Russia. By this bold statement we mean that the redistributive economic model (X-matrix) dominates "by nature" in Russia, whereas '(neo-)liberal' market institutions (Y-matrix) are not dominant but rather complementary. Forming the appropriate ratio (proportional balance) between redistributive and market institutions has a spontaneous character and is the result of the economic system's self-organization under various internal and external conditions and challenges. People and authorities can actively help to achieve this balance faster and more efficiently than just letting history take its course.

2. The Institutional Analysis of Modern Russian Economic Reforms

From the IMT's point of view the essence of Russia's economic reforms is the search for an optimal combination of market (or "liberal") and redistributive institutions and modern forms of their embodiment.

By the middle of the 1980s, on the eve of *perestroika* (term of the Soviet Union) or move to a *transition economy* (term of world social sciences), Russia had an imbalanced institutional economic structure³. It manifested itself in the predominant and active development of X-institutions in a redistributive economy only. Y-institutions, which were necessary for the

³ ³In the political and ideological spheres, we also had an imbalanced structure with total domination of X-institutions.

successful growth of the economic system, were under-developed and existed as latent, shadowy or illegal forms only. Such an imbalance in the end resulted in an inefficient social system and led to a large decrease in the nation's economic and social parameters. The need for system reconstruction and rearranging the institutional structure was recognized in Russian society.

We can distinguish two main stages in the transition process during that period. The first one started in the middle of the 1980s when new political leadership (i.e. the first USSR President Mikhail Gorbachev and the first Russian President Boris Yeltsin) began to develop market-based Y-institutions with legislation.

From the mid-80s, new market Y-institutions began to be implemented:

- Privatization (in different forms) of the majority of state-run enterprises and all state-run middle and small enterprises was put into practice to create **private ownership**. What was privatization? Each citizen received a voucher as a right to a 'share' of public property. The process of concentrating vouchers began and gave rise to the first 'capital' formations;
- Decentralization in the economic governance system was made to develop **exchange** transactions instead of redistribution. The state planning system ("Gosplan") and rigid connections between economic agents were liquidated. Price management was stopped;
- New laws about the creation and liquidation of new enterprises and small business in all branches of economy (from finance and banks to trade and services) were passed to develop **competition**;
- **Contract labour** substitutes were enacted for employed (unlimited-term) labour because the state system of manpower training and distribution was liquidated. Relationships between employees and employers became the subject of contracts. Both state salary management and price regulation were cancelled;
- **Profit maximization (i.e. Y-efficiency)** became the main criteria for new enterprises and their owners began acting in an open and competitive market environment.

Nevertheless, the attempt to completely replace redistributive institutions by market ones failed, as we know now. This is evident because there was neither growth in total efficiency of economy nor expected efficiency increases in new companies of that period. In 1998, after

Russia's *national default* the state economic policy was turned to searching for an optimal and balanced combination of related market and redistributive institutions⁴.

Since the late 1990s and early 2000s (i.e. when President Vladimir Putin and new political leadership took office), more attention has been paid to the modernization of redistributive X-institutions rather than to implementing market Y-institution as before:

- **Supreme conditioned ownership** institutions shows up in the creation of large-scale joint-stock companies and holding structures under management (or with control share in capital) by the Russian government or regional governments. Such companies are mainly present in infrastructure building, housing management in cities, information and communication or high-tech branches, including gas, petroleum and energy production, as well as transportation, including railway transport, the motor-car industry, space and aircraft construction, etc.;
- **Redistribution** is presented in new *National Projects* under federal governance and is supported by the federal budget. These projects cover the main spheres of human living, namely education, public health, housing and agriculture. The centralization of National Projects Management on the new level puts the redistribution scheme (accumulation-coordination-distribution) into action. National projects have added to the system of Federal target programs and other forms of centralized state support in various fields of activity, which have become more and more, especially in connection with the financial and economic crisis of 2008-2009;
- **Cooperation** is offered in wherein the state supports creating economic structures in which enterprises interact on the basis of not a competition, but also cooperation. In detail below is considered the case of state corporations (STCorps), actively introduced in 2007, which illustrates this tendency;
- Developing **employed (unlimited-term) labour** is expressed in the following: 1) organizing industry specialists in the education system on the basis of private-and-public partnerships with the state retaining its leading position; 2) new labour policy that is

⁴In China such balanced approach took place from the beginning of economic reforms in later 1970-s. It is one of the main courses of their successful «planned economy with market regulation» policy (The China Society Yearbook, 2009:37). This is what we supposed (Дерябина, Кирдина, Кондрашова, 2010).

primarily oriented towards the wealth of people working in the so-called “state budgetary financed area” of the economy; 3) growth of non-monetary factors of labour rewards (which is peculiar for the system of employed labour);

- **Cost limitation (X-efficiency)** is expressed in price and tariffs regulation, both at federal and regional levels. The main objective of corresponding commissions (in electric power, railway transport, housing service) is not revenue of the companies but rather decrease of general resources and manpower used, as well as national product expenditure and total cost of its production. Governmental pressure to reduce the level of credit rates for the state, and non-state banks also testifies to expansion of the sphere of action of this X-efficient institute (for more detail see Верников, Кирдина, 2010).

As a result, a new balance of redistributive (X) and market (Y) institutions is being created in Russia at present. The re-development of redistributive X-institutions in the social structure of Russia along with further support of market Y-institutions has formed a more balanced (in favour of the former) institutional structure. The process of this formation has gone along with the recent growth of economic and social development indexes in Russia. In April 2008 (i.e. before the world financial crisis) Russia occupied 8th place on the national GDP index, compared to 18th in 2005.

But the crisis has shown that Russian development was neither stable nor self-dependent. In 2009, Russia had a GDP decrease of more than 8%. In comparison, the Indian and Chinese economies in 2009 resumed growth at about +7 and 10% respectively. Another member of BRIC - Brazil - also had positive growth. The average level of GDP decreases in the USA, Japan and the Euro zone was less than minus 1% (Sources: IMF, Bloomberg).

Why has the Russian economy not proved resilient? Delayed institutional stabilization actions and the backwardness of the post-Soviet economic structure, based mainly on raw material exports, has resulted in the unsteadiness of Russia’s economic development. The Crisis of 2008-2009 has shown that we are dealing with long-term, serious problems, namely, the inefficiency of institutional and economic structures. Up until the crisis, neither institutional nor structural modernization was carried out sufficiently or successfully.

3. From a raw materials economy to a hi-technology economy

Though gas and energy carriers still remain major Russian exports, Russia is now actively working out new S&T policies and the strategy of hi-tech sectors development. Ever

since 2002, the target of the state policy has been transition to an innovative way of Russia's development. Forming the National Innovation System (NIS) is an integral part of state economic policy (Lenchuk, 2006).

What were the initial conditions? Unfortunately, the structure of the Russian economy has changed notably over the period of market transformations: technological shifts have been obviously regressive. There was a washout of innovation intensive manufacturing industries in favour of mining and raw materials processing branches that practically do not give any impulses to innovation development. In addition, a huge brain drain of potential innovators in science and technology was taking place. Emigration amounted to nearly 1 million people in 1990-2000s or more than 10% of the able-bodied population.

Despite the losses suffered during the transformations from a planned economy to a market-based economy, Russia continued to possess one of the largest scientific potentials in terms of its scientific workers, lagging behind only the USA, Japan and China. The goal for the NIS was to actualize and develop this one world-class scientific and technical potential.

During the first stage of creating the new NIS (2002-2006), the Russian government oriented itself to institutional models tested by world practice in developed countries. But neither businesses nor the state could successfully carry out these models. Here is a list points criticized in the developing the NIS in Russia during these years:

- Attempts at mechanically transferring foreign experience (first of all, from the USA) to Russia for organization of research, development and education system did not take into account the real conditions and history of Russia's development;
- There was no single governmental body was responsible for developing, regulating and defending the intellectual property rights of innovation policies involved in the new system;
- There was not an integral approach to information processing and knowledge transfers in the NIS;
- Coordination between the state and private sectors in developing priorities and measures for establishing financial support of potential research work was weak;
- The activities of large and small enterprises involved in science and business development of high technologies in Russia was low.

At the beginning of 2006, conceptual approaches to forming the NIS in Russia were changed and became more diverse. The main emphasis was laid on the role of increasing and concentrating federal financial support and regulation on activating state-private partnerships. In fact, a different institutional design was proclaimed.

Stronger state financial support and regulations during the second stage of NIS started by forming new financial institutions for innovation development (e.g. the Federal Law of “Bank for Development,” adopted in 2006). The Russian state would try (as promised) to completely finance all infrastructure needed for special economic zones, including technical and promotional zones and techno-parks. On January 1, 2008, special measures aimed at forming a more favourable innovation climate were proposed for execution.

What were the main directives for activating state-private partnership mechanisms? The Federal Target Program (FTP) – «R&D along priority lines of developing the Russian scientific-technological complex in 2007-2012» – provides for more active participation of the private sector. Practically all innovation projects in this program are to be financed by the state jointly with private business. The volume of the required off-budget (i.e. non-federal money) co-financing varies depending on the type of project: for researching and developing technologies, co-financing is set at 20-30% of the project's cost and commercializing technologies is set to 50-70%.

4. State Corporations as new institutional forms in S&T policies

The modern forms for concentrating state resources in hi-tech branches in Russia are now called *State Corporations* (StCorps). An integral part of the NIS is in establishing StCorps in the most competitive branches of the economy: nanotechnology, aircraft-building, space, nuclear power-plant, engineering, shipbuilding, and defence of the industrial complex. Within the framework of these fields, federal target programs are formed and questions of funding concrete innovative projects are worked out.

The creation of StCorps in Russia was the first response to modernization challenges and to making effective investments in the high-tech industry. The development of StCorps implied that these businesses could become the locomotives of a breakthrough in the domestic economy.

Russian legislation defines that SCorps can be set up in any sphere that is crucial for the nation. In general, are made to solve problems in spheres that have a significant role for national, social and economic development or for national security; i.e. high risks, with a low rate of

return on capital and for large-scale mega-projects. A StCorp is legally a non-profit foundation (i.e. organisation) responsible for the more effective use of managerial and financial resources. The scope of powers and resources, which are allocated by the Federal Government to StCorps, is greater than resources allocated to existing stock-share companies with 100% state capital.

As for the National Innovation System, StCorps have a special role. First of all, StCorps are established with the aim of healing damaged economic ties in high technology industries and consolidating enterprises with a certain kind of branch profile. StCorps are designed to improve the competitiveness of Russia's products on the world market by introducing modern technologies. We know that large consolidated companies have a greater capacity to invest in S&T development than small ones, which is another reason for implementing StCorps. And last but not least, scientific development requires long-term investments, namely, federal budgetary funds are intended to establish "long" money for today's StCorps.

There have been many opinions on the role and prospects of StCorps in Russia. Some economists consider them as unnecessary and a strange form of organization. This opinion was very popular especially before the financial crisis in October, 2008. In spite of that, our analysis conducted at that time (Кирдина, 2008) showed that StCorps were logical and 'natural' for Russian conditions and would probably serve as the long-term institutional form. This analysis was made on the basis of Institutional Matrices Theory (see above and below).

As for the history of establishing StCorps, the article "On State Corporation" amended a special federal law "On Non-Profit Organizations" on July 8th, 1999. There the goal of StCorps was clearly defined as: "the implementation of social, governing and other publically useful functions". The entrepreneurial activity of StCorps is performed only for the sake of the goals it was created for, but not for gaining profit. Each StCorp must be created and grow in compliance with a special federal targeted law, which was passed for this purpose. This law is considered as a Constituent Document for every StCorp. Provisions of the federal law "predominate over the provisions of the Law "On non-profit organizations", which are applied only subsidiarily".

The commissioner of every StCorp is the Russian Federation, represented by the Russian Federal Assembly, which passes and approves laws establishing StCorps. The treasury of the Russian Federation contributes assets. In the case of liquidating a StCorps, the real property is transferred to the owner, which is the State. The Accounting Chamber of the Russian Federation

controls property usage. Each StCorp has to issue an Annual Report in the official federal mass media, such as “The Russian Newspaper”.

In spite of the fact that legal forms of StCorps have been known for over 200 years in western countries, the idea of such a special StCorp was borrowed by Russia from China. This legally “sleeping” form started to be implemented in Russia only in 2007⁵. The reason given for creating StCorps was the inefficiency of domestic investments in Russia’s economy. According to expert company reviews, 1% growth of assets per employee gave only a 0.4% growth in his or her productivity. The idea of setting up holding companies, which had been popular in Russia before 2007, failed. A holding company is a profit-oriented economic structure, more consistent with the Y-efficient institutional structure. It had been planned in Russia to set up 37 holding companies from 2002 to 2008, but in reality only 17 such companies were created.

As for StCorps, they are rapidly developing in the Russian economy and society. In March 2008, the share of SCorps in the expenditure of State budget was 17%, while accounting for 22% of its income (Государственные корпорации в России, 2008). At present, there are about 10 State Corporations, which have been created to solve the most important investment-demanding problems. For example, «VneshEconBank» was created in May 2007 to ensure the enhancement of competitiveness in the economy; «RosNanoTech» was set up in July 2007 to develop new nano-technologies; «The foundation for reform of the housing sector», also started in July 2007, with the aim of modernising residential housing utilities; «OlimpStroy», in October 2007 to develop the future Olympic Games constructions; «RosAtom», in November 2007 to modernise the economy’s nuclear sector; and «RosTechnologies», in November 2007 to support the production and export of the high-tech industry, etc. It is expected that StCorps will be set up in the finance sector and also in other branches of industry.

Recently the head of the «RosTechnologies» StCorp said⁶ that the corporation was modeled on the Italian group of companies Finmeccanica, established in 1948. The prototype of this group of companies was the State Institute of Industrial reconstruction (Istituto per la Reconstruzione Industriale, IRI), created by Benito Mussolini back in 1933. Now the company

⁵ Before that only one state corporation «The federal agency on insurance of individual bank accounts» was created in January, 2004.

⁶ <http://www.rostechnologii.ru/archive/3/detail.php?ID=333>

places Number 1 in high technology in Italy and 3rd place in Europe, with 16% of the company's revenue invested in R&D⁷.

Our institutional analysis shows that modern Russian StCorps correspond to the nature of basic X-economy institutions according to their key parameters. Here are the summary proofs of this situation:

- It is possible to set up a StCorp only according to the special law of the Russian Federation. StCorps report to federal executive bodies, which appoint the StCorp's General Director and form the Supervisory Board. The state controls the assets of StCorps. In case of its liquidation, all assets are to be returned to the state, as the owner of these assets. These features correspond to the performance of *Supreme Conditioned Ownership institution* of an X-economy;
- StCorps have a hierarchical structure, which implies not only the division of labour functions and responsibilities between the levels, but also the organizational and financial subordination according to the level of hierarchy. This corresponds to *the Redistribution institution* of an X-economy, i.e. where the economic center has both a leading and mediating role;
- Technologically dependant enterprises and enterprises belonging to the same industrial profile are incorporated into a single definitive StCorp. This is done so that the enterprises will not compete with each other, but rather so that they will consolidate their performances and business activities. Such a model corresponds to *the institution of Cooperation* in X-economies;
- Profit making cannot be main the aim of a StCorp; this corresponds to *the institution of X-efficiency* (in contrast to Y-efficiency, which aims at profit maximization).

We can see that Russian StCorps do not correspond to typically western standards or expectations. Instead, they correspond to the dominant national institutional framework in Russia, which we call an X-matrix. This dominant form is the result of a long period of successes and failures in Russia's economy, society and politics. At the same time, StCorps are a «Y-influenced» institutional form, in that they got their particular orientation in light of experiences and inter-relations with the liberal market environment (e.g. share capital, budgetary principles, etc.), which is not its opposition, but rather its structural compliment.

⁷ <http://www.finmeccanica.it>

Furthermore StCorps have a high potential, not only as «breakthrough» institutions in Russia's national economy, but also as structures that provide new opportunities for mobilizing both public and private capital working together. StCorps can cooperate both based on market terms (i.e. on the global market) and on state-administered terms (i.e. domestically). The legal mechanism to solve pressing economic and social problems were lacking before the creation of StCorps.

Contrary to the Federal State Unitary Enterprises, the aim of which was to implement Federal Target Programs (FTP), StCorps are supposed to become more financially efficient market players because they have the legal right to secure internal and also foreign loans, to issue bonds, etc. StCorps are thus better partners for the private sector because they have the opportunity not only to have “principal-agent” relations, but also mutually implement different projects on the basis of “public-private” partnerships. For instance, StCorps do not have any legal restrictions on purchasing products and services, which was the case with FTP.

The first functioning years of StCorps identified the following problems:

- Neither clear goals nor clear focus on specific projects (i.e. "dispersion" of resources);
- Vague responsibility for the use of StCorps' available funds and resources;
- Low efficiency and lack of performance evaluation parameters;
- Weak management and misuse of funds and property (e.g. mass media reported that the Accounts Chamber of the Russian Federation revealed financial irregularities such that it was ready to act with charges against StCorps. (But representatives of StCorps deny this information).

In our analysis, further «marketization and liberalization» (in the Y-institutional framework) and «redistributization» (in the X-institutional framework) can help to solve these problems. As for StCorps' “marketization”, first of all it is necessarily to mention the transparency of their development. Taking into consideration the public character of StCorps, the standards of their transparency should be higher in comparison with ordinary stock-share companies. The fact that each StCorp is set up by a special federal law gives the opportunity to put such a ‘democratic’ transparency requirement into practice. Prospects for StCorps' “redistributization” include the development of control and planning tasks for StCorps' performance as well as implementing a system of indicators (i.e. measurements) to show the

fulfillment of these plans. Regular monitoring and control over the use of funds (e.g. state budget funds) by the Accounts Chamber is also strongly needed⁸.

What is the future of StCorps in Russia? On the one hand, Russian President Dmitry Medvedev said regarding StCorps: "I do not think that this is the correct method of reforming our economic structure. In certain areas we really decided to use state corporations. But their life should be finite"⁹. His governing team proposes instead to reorganize the StCorps into ordinary joint stock companies. On the other hand, the Ministry of Economic Development, Federal Financial Markets Service and Central Bank are preparing a bill to create a new StCorp called the "Russian Financial Agency" (RFA). Its main goal will be to improve management of state assets and liabilities. A Deputy Finance Minister Dmitry Pankin said in September, 2009: "While no governmental decisions on a cancelling of state corporations are present, we have analyzed all legal forms and consider the most convenient variant to be the state corporation." So, we see different views being put forward by government officials and agencies and must wait to learn what the next steps will be.

At the current time, a compromise proposal has been accepted for developing and improving the activities of StCorps based on their reorganization. In February 2010, the Ministry of Economic Development of the Russian Federation presented a corresponding plan for the government and the President of Russia. Changes were proposed in the organizational-legal form of StCorps: for them a special category was entered into juridical classifications of "legal entities under public law." The proposal is to make joint stocks for StCorps, which will help to establish the government's more effective control above the activity of the StCorps' management¹⁰.

Our institutional analysis of Russian StCorps leads us to suppose that this relatively new form is in fact a future trend that will assist in further transforming the high-tech industry. It also has the potential to become a much-needed answer to global technological challenges and challenges of innovative modernization. This is why we suppose that the quantity and capacity of StCorps in Russia (and also around the world) will increase. Russian StCorps represent a reproductive "matrix" with the basic institutional characteristics of a redistributive economy. At

⁸ "For the purpose of exercising control over fulfillment of the federal budget the Accounts Chamber of the Russian Federation is established" -The Constitution of the Russian Federation. Article 101, paragraph 5.

⁹ Interview in the newspaper "Kommersant." June 4, 2009. <http://www.rian.ru/economy/20090605/173321132.html>

¹⁰ February 11, 2010 <http://slon.ru/articles/284882/>

the same time, they are the result of institutional economic modernization based on responding to market reforms. The continuous reorganization (cf. modernization) of StCorps in Russia confirms this assumption.

Findings and Conclusion

In the early 2000s, Russia started to build an economy based on innovation. The country possesses one of the largest technological and scientific potentials (behind the USA, Japan and China), but its National Innovation System isn't yet formed. Attempts at mechanically transferring western (i.e. foreign) experiences into Russia proved to be failures and not successes. A new institutional model for the Russian innovation system is now developing, by taking into account the real economic history of the country along with current institutional theory. Attempts to find an appropriate balance between X- and Y-institutions in contemporary Russian innovation policy are therefore continuing.

Establishing an effective proportion between redistributive and market economic institutions, is one of the important goals for Russian S&T policy. The "institutional character" of Russia fixes the limits of liberalization and needs the active implementation of Y-institution policies within a framework of modernizing and developing X-institution policies. Our institutional analysis of such new phenomenon as Russian State Corporations allows us to conclude that this relatively new institutional form is a future trend for transforming high-technology. It can become Russia's answer to global technological challenges.

Our prognosis based on Institutional Matrices Theory (or X- and Y-theory) is the following: the Russian innovation system will move from the western-oriented institutional model to the Chinese one. This is because the Chinese model is more appropriate to adopt in the current Russian situation. The aim of Russia's innovation policies must therefore look to balance between X- and Y-matrices, developing a successful combination that will help it move forward confidently as a sovereign nation, moving further beyond the shadow of its Soviet past in the 21st century.

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