UDC 33

Russia – XXI century: Non-linear state and corporate trends of development of innovation economics

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Abstract

The article considers the issues of innovative development of the Russian and world economy in the XXI century. The analytical material is interpreted taking into account the scientific and/or practical significance of the methods, methodologies and paradigms of popular geographers, politicians, philosophers, economists and public figures of the industrial countries of the world. The polysemy of the concept of "innovation as an economic category" is opened. The main goals and objectives of innovations in the development of the national economy of Russia and the world economy are determined, first of all, taking into account the conceptual scheme of interaction of the modern state and the market of innovations proposed for critics. In this paper priority directions and models are formulated – non-linear state and corporate trends of development of the innovative economy of the Russian Federation at the beginning of the XXI century. Emphasis is placed on the natural and resource potential, economic and mathematical methods and models, synergetics and world experience, which stimulate the development of national and world innovation markets.

For citation

Sabanin S.A. (2018) Russia – XXI century: Non-linear state and corporate trends of development of innovation economics. *Ekonomika: vchera, segodnya, zavtra* [Economics: Yesterday, Today and Tomorrow], 8 (8A), pp. 121-131.

Keywords

The industrial states, innovative development strategy, national economy, modernization of industrial production, import and export of investments, interaction of a state and business, directive and economic methods of management, global isolation of a state and the international sanctions regime.

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Introduction

Technical and technological development of modern world economy has passed halfway mark of the fifth Kondratiev cycle. The frames of this cycle are defined by the beginning of 1975 and completion of the year 2025. The most important innovations of the fifth Kondratiev cycle are: atomic, space and missile equipment, microelectronics, computers, Internet technologies, foresight technologies, tele and mobile communications. In the second half of the 20th century world economy has changed for production of computers and means of mobile communication, and for the purpose of deriving of profit and excess profit many material production industries of the countries of North America, Europe and Japan have moved to the countries and regions with cheap labor force and/or with reduced taxation, such as Indonesia, Malaysia, Singapore, Philippines, Brazil, Russia, India and China. However, a dynamic enrichment of the world market by such kinds of goods and services state economy has entered to reduced phase of diffusion of the "K-wave" length. At the turn of centuries, human civilization has achieved the maximum criterion of development of energy – industrial cycle.

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According to the theory of the Russian economist Nikolai Dmitriyevich Kondratiev (1892 – 1938), a new rise of world economy may begin not earlier than 2025, in conditions of global innovation (engineering) discoveries and/or by implementing of "significant" local innovations in material production and service sector, which will change structure of future consumption, and also will create new products and services for human civilization. That what happened on lower waves of a "K-cycle" during default of American Dollar meaning that innovations of subsequent cycle of development of human civilization are created at the end of the preceding cycle. [Kondarat'ev, 1989].

Today forming of innovation outlines of the six "K-cycle" may be forecasted and/or modeled including the development of modern world technological "trends": creation of materials with new quality features such as chemical fibers, plastics; production of metals with preset features for manufacturing of instruments and tools; nature protection measures on the basis of development of non-waste industries; reducing of pollution emissions on transport and new ways of treatment of nuclear wastes; collection, storage and handover of all kinds of information in real time; using of medical robotics and gene engineering for extension of human life.

In world economic literature term "innovation" has many meanings. A classic example: innovation is creation, use and distribution of a new technical, organizational, economical and other means, subject, product or process [Illyustrirovannyi entsiklopedicheskii slovar', 1997]. Many of the authors, foreign scientists among them, explain concept "innovation" depending on object and subject of scientific research. For instance, Austrianan scientist Joseph Alois Schumpeter defines innovation as a new scientific, technical, organizational combination of production factors, motivated by enterprise spirit [Schumpeter, 1982]. As per international standards in science and technology "innovation" is a final result if innovation activity, which is realized in the form of a new and/or improved product, implemented on the market, a new and/or improved technological process, used in industrial activity or in new types of social services.

Many scientists of the world and Russia occupied themselves by scientific research of creation and distribution of innovation, among them: American economists Simon Kuznets, Graciela Chichilnisky, Israeli psychologist Daniel Kahneman, as well as Leonid Kantorovich, Pyotr Kapitsa, Andrei Sakharov, Vitaly Ginzburg and Zhores Alferov. Fundamental conclusion: in all times innovations received and

are receiving different reaction of human civilization, from support and approval to resistance and counter effort of state and business.

Innovation potential of state constitutes a combination of objective factors and civil institutions having a direct ability to carry out and intensify innovation activity. It is natural that innovation potential of a country is defined by two main factors:

- Corporate culture and competitiveness of manufacturers of goods and services on internal and world markets;
- State priorities of innovation policy in the sphere of development of big business, small and medium enterprises.

State priorities and competiveness of producers of material and spiritual values are in permanent interaction and depending on conditions of international policy of state, complementing each other to various degree. In complex social systems such interaction is organized on synergetic principles and preconditioned by direct and inverse connections [Khaken, 1991]: the higher the conditions for implementation of innovations created by state and business, more active implementation of innovation potential of public owned factories and private companies a creation of corresponding motivation both on macro and mezzo or micro levels of management is required. Complex territorial social-economics systems (TSES) must create special *organizational, legal and economical mechanisms* of development of innovations, including by modern methods and models and by means of which new innovations are implemented – meaning that new forms and methods and implementation and creation of scientific, engineering and technological are realized in serial production, first of all, material production.

In modern developed industrial countries, such mechanisms were formed within long period of time in a natural way. The formation of these mechanisms took place in the conditions of systemestablishing market principles of development of national economies with administrative, legal and financial measures of state support in the field of institutional and infrastructural transformations. In the second half of the 20th century a new scientific, technical and technological developments in material production and service sector in such countries of North America as the United States of America, Canada, Western Europe, such countries as Great Britain, Germany, France and Japan owe much to a constructive cooperation of state and corporate business.

In countries with developing economies, such as Argentina, Brazil, Mexica, Hungary, Czech Republic, Poland, Ukraine, Russia, India and China where corporate culture of production and social relations is in development stage and is based on principle of "trial and errors" market mechanisms are not able to create enough challenge for development of innovations. At this stage role of a state in development of national economy and innovations will be high. In practice, we see a different trend. For the countries with developing economies, including Russia and Eastern Europe states, a characteristic feature is that economic and social transformations happen in conditions of "**undecided**" state power. First of all, this is reflected in special manner and possibilities of state management of political and social processes. Negative influence from the state is shown in both constant changes of economic course "to privatize" or "to nationalize", and in the absence of "stable" administrative and social institutions, irrational accumulation forms, storage and use of financial reserves. This creates problems of development of national economy and is expressed, first of all, in:

- non-effectiveness of policy, permanent debt of wages, pensions and social payments;
- real rise of transactional expenses, resulting in decrease of competitiveness of national manufacturing;

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 non-effectiveness of federal and regional regulations, other normative documents regarding support of corporate business and enterprising, guarantee of economic, food and environment safety of the country.

Nonconstructive state policy creates a negative impact on innovation processes as well. Innovations and implementation require favorable institutional environment, which may be created on the basis of centralized state policy in the sphere of innovations. At the same time, state management of national economy on the basis of created environment especially cultivates corruption and lobbyism, and this aggravates implementation of innovations and influence of technological progress on development of national economy. Strengthening of state role in development of national economy shall not be limited to an increase of abilities of civil servants to interfere to economic activity of companies, firms, corporations, to subjectively separate financial and material resources. There are individual examples of improper use of "administrative resources" in such regions of Russian Federation, as Bryanskaya, Nizhegorodskaya, Novosibirskaya, Tvekskaya, Sakhalinskaya oblast and Komi Republic. The main objective of "presence" of state in economy – minimization of disproportions in the development of system-forming mechanisms of the sectorial economy, and not a restoration of directive and centralized form of state management. It is unacceptable that solutions of issues of modernization of national economy will be limited by "information public relations", "popular project", "bureaucratic regulatory activities", broadening of powers of controlling authorities of all branches of power - an individual example, when in 80s of 20st century in Soviet Russia on state level it was declared a five year plan for "quality and efficiency".

The large Russian business and small business quite objectively perceives a trend of strengthening of state regulation in modern national economy. That is why in the focus comes cooperation of executive and legislative bodies of state power with leading unions and associations of entrepreneurs, which fill in the "void" between the state, business and enterprises in solution of macro and/or micro problems of technological, economic and social development of the country in realization of the state strategy of innovation development and modernization of national economy. Coordination of activities of the state and business must be built on not the basis of enforcement of "social responsibility" of corporate institutes – individual examples of 21st century in Russia – "Crocus Group and improvement of Russky Island" (Primorsky Krai), "Interros Group and development of a city of Sochi" (Krasnodarski Krai), "SGM Group and construction of Crimea Bridge" (Crimea), but a synergetic approach¹ to forming of overall strategy of development of the Russian state, directed to innovative way of development of economy.

On Figure 1 a conceptual scheme, reflecting major direction of development of the Russian state and market of "innovations" is shown. Like any segment of economy, "portfolio" of innovations is formed on the basis of "supply and demand" of modern human civilization, which in their turn, is defined by plenty of "internal" and "external" factors, and the majority of these factors are defined by administrative, political and financial functions, performed by the state within the borders of the world.

Main multiplying trends of state policy for forming of economic methods of development of innovative entrepreneurship in modern Russia [Rossiya v tsifrakh. Kratkii statisticheskii sbornik, 2017] defines "environmental determinism", which is objectively² assigned as a status of "world great power" to a developing country:

¹ In 21th century, multinational and synodical Russia must learn how to live and advance national economy on the principle of rationality and new paradigm defined modern style of thinking of nation – synergy, when world and processes, going on in the world are considered from the point of view of self-organization and development of open dissipative systems.

² Subjectively, status of Russia, as a "World power" is confirmed by having technologies for using of hydrogen and nuclear energy.

1. Country' square footage (1st place in the world, 2015) – 17,07 mln.sq.km.

2. Population (9th in the World, 2015) – 146,50 mln people, not more than 30,0 mln compatriots living abroad, first of all in such countries as Germany, Great Britain, France, Canada and USA.

3. Natural resource and economic potential (1st place in the world, 2015), is evaluated by the market price of not less 75.70 billion US dollars. The Russian Federation holds the first place among all other countries of proven reserves of natural gas, iron ore and wood; the second – of coal, rare earth metals and diamonds; the third place – of gold and platinum; the forth – nickel and cobalt; the fifth – of copper and lead, the sixth – of oil and gas condensate; the seventh – of tin; the ninth – of uranium [The World's Most Resource-Rich Countries-24/7 Wall. St., 2015, www].

In the world economy a wide variety of scientific methods and dynamic models, administrative, political, legal, economical and ecological mechanisms of state support of innovations, directed to different entities of innovation activity are developed, including, education entities, research institutes and laboratories, big multinational enterprises, small and mid-sized business.

Strategy of development of "innovation economy" of Russia in 21st century must be created on the basis of world experience, natural resource and economic potential of the territory of the country, financial abilities of state, corporate and global institutes, including direct foreign investments, taking into account geographic, historic and multinational peculiarities of development of "the Russian civilization and/or "Russian world".

On the level of model, the following scenario must be taken into account:

1. "*Rapid development*" of "innovative entrepreneurship" in military industrial complex of Russia, and further producing of goods of "military" purpose in civilian sector of national economy/

2. "*Catching up development*" or borrowing of foreign technologies for modernization of tools, labor goods or capital funds of the country of various forms of incorporation.

3. "Attraction" of multinational enterprises and financial funds for study and evaluation of the natural resource and economic potential of the country, development and working out of deposits, first of all, oil and gas, on the terms of scientific development and research of "innovation production" within the borders of the Russian Federation.

Priority trend and model development of "innovation economy" of the Russian Federation in 21st century:

1. To work out and fulfil before 2025 a program of intensive development of industry sectors of national economy taking into account of state priorities in production and advance refining of oil; natural gas production and means of transportation to consumers; aviation, space, hydrogen and nuclear industries; power machine industry and energy saving; nano- and biotechnologies of agricultural and medical economics. These priorities in specific geographic time and space allow to overcome "a syndrome of innovation decay" of state sectors of agricultural, industrial and service sectors, shall provide national, food, medical, power, and ecological security of population of the country³.

³ Conclusions of the author of scientific work are based on data of world statistics. 1. Oil and gas profits in the structure of Russian budget are increasing and reaching: 16,00% in 2000; 42,20% in 2005; 46.10% in 2010; more than 52,50% in 2015. 2. At the same time, tax revenue to the federal budget from petroleum export are: 9.50% in 2000; 40,30% in 2005; 45,70% in 2010; 49.80% or 329.30 bln US dollars in prices of 2014. 3. Potential of growth of economy sufficiently increased due to international economic activities of military industrial complex of the country (13.0 bln US dollars in 2015) and agricultural economy (15.0 bln US dollars in 2015).

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Figure 1 - Conceptual chart of cooperation of state and "innovation" market

2. Within the frame of modernization and development of national economy to develop and fulfil before 2025 organization, legal and economic mechanisms encouraging long term innovation processes in the country, such as privileges, grants, including on regional level, within the frame of powers of entities of the Russian Federation.

Foreign experience clearly shows that in the countries with developed industrial economy such as Great Britain, Germany, the United States, France and Japan, innovation business is supported by state and has tax privileges. For example, profit gained for the period of several years is not imposed by taxes. Regarding small companies, there exists tax privileges for them as well: for example, in newly formed small companies do not pay taxes; in other countries it is a state policy that is realized in the form of tax privileges for some types of small companies. They begin to discuss these questions in modern Russian literature as well.

3. Mainstream in solution of issues of modernization of outdated scientific and production and technical base of the national Russian economy, in particular, updating of outdated means of production – this is a development and realization before 2025 of a program of import of "innovation technique", including on the privileged conditions, principles and laws of catching up development of human civilization, which shall allow entrepreneurs not only to update manufacturing capacities and also to acquire new samples of modern technologies.

In modern Russia share if direct foreign investment into gross domestic product is less than 1,0% from total volume of capital forming investments, and this is four times less that in India, five times less than in Brazil, six times less than in Indonesia [Fisher, 1999]. Taking into account low level of capital forming investments it is worthwhile mentioning the high potential of increase of import of direct foreign investments, as minimum as to 10,0% before 2025 in machine building, food and light sectors of national economy.

4. An important issue of development of innovation activities is preparation of highly qualified specialists and scientific human resources. Before 2025 the Russian Federation must practice comprehensive support of higher and middle education. This problem becomes of higher priority in the light of recent quite creative speech of the President of the Russian Federation Mr. Vladimir Putin [Vystuplenie Prezidenta Rossiiskoi Federatsii V.V. Putina..., www]. However, one fact is alarming, that from the year 2012 inclusively, with annual increase of expenses for Management of civil society for 1,0% and annual increase of expenses for national safety from "external" and "internal" threats for 2.0%, annual budget expenses are: for preschool education– 1,0%; for middle school education – 2.0%; for higher education – 4,0%; for health care – 6,0%; for pensions for population – 8.0%, for fundamental research – 10,0%.

In the conditions of global society crisis of modern civilization [Sabanin, 2012] fundamental scientific research and implementation of innovations to production are moving force of development of "innovation economy" of the countries of the world. That is why international competitiveness of the Russian national economy in the future will be provided, first of all, not by a "mentality of the Russian civilization" and a quality system of higher, middle education but also as an effect of qualification improvement of not only engineers and innovators but also teachers, and scientific workers.

In the context of the main courses of the development of the "innovative economy" for the period up to 2025, the practice of creating state technopolis, in which information and consulting, legal assistance and concessional financing for corporate, small and medium-sized businesses should and will be provided. For example, in technopolis of Standford University (The United States of America), where in the recent past the "brains" of world leaders in the sphere of high technologies originated – Apple, Google and Yahoo – and within one decade of 21st century has turned into profitable "brand" with yearly total income more than 200 bln US dollars.

5. If Russian plans to carry out large-scale administrative, political and economic reforms before 2025, then the strategy of transformations must be coordinated both in time and in resources with innovation targets of state in conducting of social policy on federal and regional year. Required and sufficient condition shall be creation of favorable innovation environment that, first of all, will improve welfare of citizens. With low level and quality of life, the main effort of citizens are aimed at issues of physical survival, and not on the issues of implementation of innovations, which require investments of funds with effective output in the indefinite future. Statistic data of the World Bank on development of "Civil society" in Russian in 21st century, unfortunately, are filled with dramatic content:⁴ (HDI) of Russian in 2000 from 0,691 shall increase to 0,788 in 2015, that allowed the state to move to 49th place in world ranking in 2018. Herewith, at that period Russia has experiences historic "Maximum" of world prices for energy products, has succeed in increase of gross national product per capita taking into account purchasing power parity from 6830,0 US dollars in 2000 to 11970,0 US dollars in 2015 and occupied a 55 place in ranking of the countries of the world.

6. Legislation must play an important role in activation of innovation processes and it will guarantee the following: legal protection of business; protection of competitive relationships on the

⁴ The Human Development Index (HDI) is the Aggregate indicator calculated annually by UN experts to compare the level of a person's development in a particular country and reflecting or revealing such concepts as "Standard of Living" or "Quality of Life". The HDI quantifies the achievements of a particular country in the field of "Health of the Nation", receiving "Education" and the actual "Income of Citizens".

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world markets; regulation of interaction of economy entities; forming the conditions of licensing, patenting of inventions; protection of property rights, etc.; interaction of corporate business, small and medium entrepreneurship with the state authorities of economy management of the country. For example, in the Unites State market of innovations is regulated by laws and orders of the President, which provide a balance of interests between the state and corporate business.

7. The main document stimulating development of high-tech industries and implementation of innovations must be investment, credit and budget policy of state [Filippov, 1999]. It assumes:

- rational planning of incomes and expenses of the budget taking into account priorities of social and industrial policy;
- strengthening of banking system and availability of budget, credit, investment, leasing and venture resources for national sectors of economy.

8. Institutional and infrastructural environment institutes of private investments, venture and investment funds, and financing hi-tech sectors are among the major conditions of development of innovation processes for Russian state. Herewith policy of state and private investment must be coordinated on the level of sources of finance: they must complement each other and not to duplicate statistics and dynamics of investments.

Solution of issue of sources and volumes of investments is an up-to-date task. The issue is complicated because investment activity is a capital intensive. For example, in order to get 10% increase of innovative product 40% rise of investments is required. Due to this reason, the required condition will be a solution of an issue of accumulation of resources, financing of innovations from consolidated budget funds.

9. In the conditions of deficit of financial – when "access to foreign borrowings", material – when sanctions for supply of materials and equipment for innovation sectors of national economy labour and other resources are imposed, a timely issue for Russian is a choice of priorities and/or directions of development of innovations. Solution of this task has a specific factor and for each constituent territory of the Russian Federation depends on current economic and technological representation of regional economy.

On regional level, it is necessary to assign a list of sectors, which form science based complex as a core of real economy and defining regional specialization of innovative process. ⁵

10. Small business must be a leader among factors of development of innovation processes in Russia. And small business shall take innovation risks which state and a corporate business cannot take upon themselves. For instance, according to data provided by the World Bank, for the last 15 years small enterprises in the United States have created 4 times more of innovative product per one US dollar comparing to large companies with a number of employees approximately around 1000 people, and, 24 times more than large corporations with a number of employees more than 10 000 people. Small business engages in elaboration of such ideas which not always ma have perspectives of getting of positive economic result.

⁵ The science intensive industries in accordance with the international classification (ISIC – UN) include about 16 types of industries producing high technology products, including: organic chemistry and plastics, pharmaceuticals, chemicals for agriculture; radioactive materials, turbines and reactor equipment, generators for nuclear, hydro and wind stations, electronic instruments and equipment for medicine, semiconductors, advanced engineering products, aerospace engineering, advanced optical instruments and measuring equipment, military equipment and / or weapons systems . For many regions of Russia, the list of the developed major high technology products is limited both by natural conditions and by skilled labor resources.

In the view of mentioned above, it is worthwhile mentioning that in order to realize directions of state and corporate policies in the sphere of innovations mentioned above both direct and indirect methods of management may be applied – economic regulators as well as mechanisms of stimulation of innovation activities. It is advised to pay attention to economic methods, stimulated forming of market of innovations.

A toolkit of direct and/or indirect and indirect and/or economic methods of development of innovation methods of development of innovation activities is quite extensive. A that a synthesis of interests of business and state power must exist as well as divisions of power and fields of activities: for example, if the exclusive right of state is mainly support of fundamental science, social domain and large – scale scientific and technical projects; then corporate business must develop applied science and technologies, which are responsible for "final" stages of implementation of innovations. Small and mid-sized business must be given an important role in this.

Conclusion

In Russia, like in the countries of Eastern Europe or China, positive interaction between the state and business should be an instrument to increase the competitiveness of the national economy, the investment attractiveness of its industries and the creation of special economic zones between the countries of North America, Western Europe and foreign countries – for example, in Kaliningrad, Gorno-Altaisk, Stavropol, Salekhard, or Vladivostok – as objects of foreign economic policy of the state. It should be mentioned that even a rich natural and labor potential, a large domestic market, a huge public sector aimed at strengthening Russia's power, at the expenses of internal sources and reserves, will not be able to ensure the modernization and development of the national economy if the universal law is objectively ignored : "The subject of internal and external economic relations of world civilization are not the states of the world, but people, enterprises, firms and transnational corporations".

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Россия – 21 век: Тенденции нелинейного развития государственного и корпоративного секторов инновационной экономики

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Аннотация

В статье рассматриваются вопросы инновационного развития российской и мировой экономики в XXI веке. Представлены различные взгляды известных географов, политиков, философов, экономистов и общественных деятелей из развитых стран мира на сущность инновационной экономики и проблемы инновационного развития, а также обоснована научная и (или) практическая значимость разработанных ими методов, методологий и парадигм. Раскрывается многозначность понятия «инновация как экономическая категория». Определены основные цели и задачи инноваций в развитии национальной экономики России и мировой экономики, в первую очередь с учетом концептуальной схемы взаимодействия современного государства и рынка инноваций. Сформулированы приоритетные направления нелинейного развития государственного и корпоративного секторов инновационной экономики Российской Федерации в начале XXI века. Особое внимание уделяется природноресурсному потенциалу, экономико-математическим методам и моделям, синергетике и мировому опыту, стимулирующим развитие национальных и мировых инновационных рынков.

Для цитирования в научных исследованиях

Сабанин С.А. (2018) Россия – 21 век: Тенденции нелинейного развития государственного и корпоративного секторов инновационной экономики // Экономика: вчера, сегодня, завтра. 2018. Том 8. № 8А. С. 121-131.

Ключевые слова

Промышленно развитые страны, стратегия инновационного развития, национальная экономика, модернизация промышленного производства, импорт и экспорт инвестиций, взаимодействие государства и бизнеса, директивные и экономические методы управления, глобальная изоляция государства и международные санкции.

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