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"Innovation Policy and Economic Actors:
State, Market and Enterprise"

Satoshi Mizobata, Olga Bobrova , Andrey Alekseev, Natalia Fomina,
Elena A. Tkachenko, Vadim Klimov, Vladislav Klimov, Vyacheslav Nabizadi,
Vladimir E. Rokhchin, Elena N. Vetrova, Anna Kovaleva, Hiroaki Hayashi

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PREFACE

Satoshi MIZOBATA
KIER, Kyoto University

Olga BOBROVA
Department of Economics and Management of Enterprises and Industrial Complexes,
St. Petersburg State University of Economics.

The idea of this brochure "Innovation Policy and Economic Actors: State, Market and Enterprise" came out during discussions in St.Petersburg and Kyoto about possibilities of cooperation between Kyoto Institute of Economic Research and St.Petersburg State University of Economics. Research visits of Russian scholars to Kyoto show a sincere interest in having reliable ties with Japanese economist interested in Russian economic development and management approach. We decided to collect the first bulk of papers from Russian and Japanese sides, publish them together as discussion papers of KIER and get the feedback from readers to make clear what attracts the interest when we speak about Russian economy to international audience. So now we hope to plan common research projects to be undertaken by St.Petersburg and Kyoto scholars and students under the topics presented in the papers below: innovations, entrepreneurship, state industrial policy in the both countries and others. Particularly, KIER has been appointed as a Joint-Usage and Joint Research Centre of Economics since 2010, and based on the joint research projects, St.Petersburg and Kyoto have enhanced their cooperation. For example, in December 2011, in the international conference of KIER on "Recent development in the Russian business economics" led by Professor Ichiro Iwasaki (Hitotsubashi University), Alexander Karlik and Olga Bobrova from St.Petersburg made their presentations. In March 2015, in the international conference of KIER on "Sustainability of Russian economy: between modernization and crisis" led by Hiroaki Hayashi (Ritsumeikan University), Olga Bobrova and Anna Kovaleva from St.Petersburg made their presentation and organized round table. Through the conferences and meetings, we have strongly focused behavior and policy of economic actors for innovation in Russia.

The authors have chosen very different themes to research the way how business is made in contemporary Russia. All are instructive for the research on the contemporary innovation policy and innovative society in Russia and a comparative analysis of the innovative society.

Satoshi Mizobata evaluates market quality and the role of innovation. He applies the 'market quality theory', in that market quality determines the content of innovation institutions and barriers they face, and analyses contemporary Russian innovation policy and innovation system, and posits that Russia needs to overcome considerable barriers in order for it to become a sound innovative society. He insists that Russia's innovation institutions have their specificities and instabilities, and owing to the weak market quality, misuse of institutions, and government failure, its innovation policy has become 'governmentalized' instead of following the path of marketization with high quality. Market quality and state/government quality are one and the same. The quality of its state/government is poor owing to its present form of governance and social mistrust. In order to overcome these barriers, he stresses on the need for social innovation as a key measure for enhancing the quality of the market/state.

Olga Bobrova tells about interrelations between industry and state in Russia for 2000-2015 period. She insists on the need of implementation of stakeholder approach to understand Russian business nowadays. On the examples of passing three economic crisis (1998, 2008-2011, 2014-) by Russian industry a comparison of effectiveness of anti-crisis measures of government from the point of view of enterprises is made. The expectations and strategies of engagement of the industrial enterprises with the state in contemporary conditions in the context of realization of industrial policy

of Russian Federation and tendency of import-substitution are considered.

Andrey Alexeev and Natalia Fomina touch an interesting topic on the significance of entrepreneurial intuition in the decision-making on the base of quantitative research. They contribute to the concept of intuition proposed by Daniel Kahneman. The authors believe that intuition acts as an operative category in entrepreneurship. The results of their statistical experiment prove viability of intuition when making investment decisions. Two independent mechanisms for investment decisions are being defined - the «rational» and the «intuitive». The research leads to conclusion that entrepreneurs' intuitive decisions carry out a relatively high level of efficiency.

Elena Tkachenko, Klimovs and Nabizadi in their paper proposed a view on project management which allows to integrate the mechanism of fuzzy logic with the tools of the assessment of real options. A modified model of cost estimation of real options is presented in the paper.

Professor Vladimir Rokhchin delivered his article in April 2015 but unfortunately he did not live long enough to see his paper published – he passed away in June 2015. We are proud to see his paper among ours, so contemporary research has a succession to the great ideas of St.Petersburg scholars as professor Rokhchin. He would be happy to know that cooperation between Kyoto Institute of Economic Research and St.Petersburg State University of Economics flourishes nowadays. By his paper a topic of territorial organization of the industry in Russia was opened in the present publication.

The theme of the State regulation of transnational production chains on the example of Russian Arctic region was continued by Elena Vetrova with her paper. She concludes about ineffectiveness of industrial policy of the Russian Federation as a whole, and of the Arctic region, in particular. Her basic idea is to support the State regulation of the production chains in order to increase the added value created by the Russian companies involved in the development of the Arctic. In addition, Elena emphasizes the necessity of harmonization of the purposes of state regulation of production chains with goals of the company by the criterion of increasing national economic efficiency.

Anna Kovaleva in her paper presents the analysis of innovation ecosystem in comparative perspective on example of Japan and Russia. Her qualitative model of innovation ecosystem to analyze success and failures of innovations will be interesting comparative studies specialists. The proposed model allows to examine innovations on three levels such as: macro-, meso- and micro-level. The results promise to be of value to significant areas of scientific practice and will also generate recommendations for the public and regulatory bodies.

Hiroaki Hayashi clarifies features of the way of work in Russia and prospect future changes in comparison with advanced countries based on economic system analysis. First, he shows variety of working hours of various advanced countries. Next, he explains the background of variety of the way of work based on two factors, possibility of upward mobility from non-elite to elite workers through hard work and public social security beyond job related one. Then, as special feature of the way of work of Russian workers, exit behaviour such as informal economic activities is widespread under the circumstances of stable employment and flexible wage. This is based on the gap between formal institutions to protect workers' right effectively and weak law enforcement. Finally, he shows some implications based on the comparison of the way of work between advanced countries and Russia.

Presenting the papers of Russian and Japanese authors to readers we hope that the studies in this brochure will give an impression of the contemporary economic research in St.Petersburg and Kyoto. Moreover we hope to enhance the potential of research collaboration.

10 December 2016

Innovation Policy and Market Quality in Russia[1]

Satoshi Mizobata
KIER, Kyoto University

Abstract
The paper analyses the contemporary Russian innovation policy and innovation system, and posits that Russia needs to overcome considerable barriers in order for it to become a sound innovative society. After its transformation, Russia changed its innovation policy from government-led to market-led. In the midst of weakened international competitiveness and economic decline, however, its policy has spontaneously changed to one of 'governmentalization', showing path-dependent evolution. Throughout the 2000s, the government introduced a succession of innovation modernization programs, but the results appear limited, and the macroeconomic indicators explain how the country continues to be mired by its traditional backwardness, as evidenced by its heavy dependence on energy exports, poor high technology exports, outdated equipment, and other such factors.

As a theoretical framework for understanding the innovative society, I apply the 'market quality theory', in that market quality determines the content of innovation institutions and barriers they face. Market quality can be measured by institutional arrangements (infrastructure, strength of the 'rule of game', and its enforcement), institutional complementarities, and transaction costs. The specificity of the Russian market indirectly characterizes its weakness in market quality, as seen in international rankings such as the Global Competitiveness Index, Corruption Index, and so on. Thus, Russia's innovation institutions have their specificities and instabilities, and owing to the weak market quality, misuse of institutions, and government failure, its innovation policy has become 'governmentalized' instead of following the path of marketization with high quality. Market quality and state/government quality are one and the same. The quality of its state/government is poor owing to its present form of governance and social mistrust. In order to overcome these barriers, I stress on the need for social innovation as a key measure for enhancing the quality of the market/state.

JEL classification: D40, E61, O31, O32, O38, O57, P16
Key words: innovation, market quality, policy, institution, path-dependent, Russia, government, infrastructure

1. Introduction
Throughout the 2000s, Russia steadfastly attempted to develop 'modernization' as the core of its economic policy and grappled with innovation-related measures. The Putin government has maintained this policy with the following targets: diversification of the economic structure biased toward resources, change to an innovation-based regime, increase in the country's competitiveness which has been declining under the transformation, and undertaking resource reallocation.

Despite its military power and the resources it owns, Russia has had to battle several economic barriers to achieve economic growth. The disease, curse, or negative inheritance of its fragile economic structure was exposed by the 2008 financial crisis, showing the economy's excessive vulnerability on a global scale. It also faces the issues posed by changing petroleum prices,

[1] The original paper was presented at ICCEES on 6th August 2015, which was based on the presentations under 'Innovation and Market Transition' at the International Seminar on Macroeconomics and Economic Systems on 9th June 2014. This research ('Innovation Policy in Russia: Can Russia Modernize?') was made possible under the aegis of The Japanese Society for Comparative Economic Studies (JECES) and Market Quality Project called 'Complex Dynamic Analysis on Economic Crisis and Social Infrastructure' (JSPS, Grant-in-Aid for Specially Promoted Research #23000001). I thank Attila Havas (Hungarian Academy of Sciences), Hironori Fushita (Japan Institute for International Affairs), Norio Horie (Toyama University), Victor Gorschkov (Kaichi International University), and Hiroshi Tanaka (Ritsumeikan University) for their helpful comments and useful suggestions.

extraordinarily low productivity, aged industrial equipment and infrastructure, weakening labour skills, and the overall backwardness in terms of its contemporary technological development. Therefore, for Russia, innovation means not only improving its scientific and industrial base but also reforming its fundamental industrial structure, market environment, life style of its citizens, and labour market. In other words, innovation can be regarded as a policy for improving the country's growth quality (Anisimov et al.,2014), and from the angle of global strategy, it may be considered as a shift of Russia's external strategy from transforming itself from a hard power to a soft one.

An ambitious policy is not easy to execute. In order to change the state-oriented research and development (R&D) policy into a market-based one, the policy, its players, and their behaviour and values must be transformed radically. However, Russia's traditional 'politicized economic model' (Oxenstierna, 2015, p.102) remains largely unchanged, and the country has retained its chronic constraints in its budgets, human resources, and infrastructure, among others, in its R&D policy.

The barriers against policy making and its execution appeared strong after the economic sanctions were imposed in 2014. The economic sanctions and anti-sanctions have led to the country's economic decline, stifling innovation by putting a stop to technology transfer. The depreciation of the Rouble also affected imports negatively. Under such a severe international political and economic environment, can Russia maintain and fulfil innovation policy? Can Russian improve its growth quality through innovation?

Even though many researchers have studied economic policies in transition on the macro and micro scales, few have shed light on innovation policy and its fulfilment with regard to the backwardness of technology in a socialist system. Marketization demands macroeconomic stability, liberalization, and a strong private sector. Although the gross domestic product (GDP) has improved from the pre-transition level, the growth base has remained backward and vulnerable to the vagaries of the global economy, and in order to improve the global business environment, a national innovation system has become indispensable. Thus, innovation has played a role in economic system reforms and has helped sustain economic growth. Graham and Dezhina (2008) examined how the global crisis changed policy. OECD (2014) has emphasized upon the backwardness of Russian innovation and insists that Russia needs skill and innovation for sustained growth. Novitsky (2009) analysed innovation strategy from a long-term perspective. It is clear that the Russian economic growth policy cannot be detached from its innovation policy.

This paper examines the direction and characteristics of innovation policy in Russia by tracing a series of policy changes. Then, I focus on market quality and state quality as factors constraining innovation. As innovation and the market quality theory share a close relationship, I measure the potential of innovation in Russia by the market quality theory.

2. Evolution of the innovation policy

The Russian innovation policy was born out of the legacy of the Soviet Union. Understanding the need for privatization and market initiative after 1992, and in order to stop the brain drain, Russia immediately set forth building an institutional foundation that included laws on property rights. The government created policies for creating a competitive environment and provided selective support. In the latter half of the 1990s, the government deregulated business by tax preferences, and venture funds were also actively established. However, 'the reform in post-Soviet Russia could not overcome the weakness of the Soviet economy' (Fonotov, 2013, p.35). During the existence of the Soviet Union, enterprises reserved scientific and technological funds for innovation. After the transformation in 1992, these funds were earmarked as technological development funds and non-budget science and technological funds under the control of the Ministry of Science and Technological Policy. The new funds were applied toward R&D support and played a key role in public–private partnership (PPP) programmes. However, legal instability weakened the effects of market-oriented measures (Fonotov, 2013, pp.36-39). As a result, fixed assets diminished sharply during the 1990s, and innovation

capacity declined,[2] and the negative legacies of the erstwhile Soviet Union, namely, state leadership, weak commercialization, poor implementation, and bias toward the defence sector, were preserved. In short, in spite of the radical transformation, the innovation policy was an extension of the Soviet legacy and debts, as well as its strengths and weaknesses. In particular, delayed application and commercialization (*Ekspert*, No. 28, 6th-12th July 2015) and the bias to the fundamental/traditional sciences and aged infrastructure were symbols of the Soviet Union's negative legacy (Graham and Dezhina, 2008; Novitsky, 2009).

For its survival, in the 2000s, the government activated govermentalization[3] and regulation to promote innovation. Markets and private firms were too fragile for leading innovation, and the market environment was not mature enough. For example, in 2006, the Russian Academy of Sciences, which was semi-autonomous, lost its autonomy and was govermentalized, becoming a *de-facto* state agency (Graham and Dezhina, 2008, pp.37-40). At the same time, the long-term development plan was adopted together with new laws. A new framework was derived for supporting small and medium enterprises and universities, and new innovation institutions were built to tackle future uncertainties.[4] State corporations also became actors for drawing commercialization under the state's control. Generally speaking, various kinds of funds related to science and technology were created using the state's laws, regulations, and federal budgets, and the role of enterprises' internal reserves was restricted (Fonotov, 2013, p.39).

'The Fundamental Policy of Science and Technology Development till 2010 and after 2010' (as per the Presidential Decree of 30th March 2002) and two decisions related to the decree (Pr-577 and Pr-578)[5] served as the cornerstones of the policy in the beginning of the 2000s. Innovation was regarded as the policy's core ideal, and the government concentrated its resources into high technology sectors. Government support became the main tool of the policy. Although the government intervened actively, market-oriented measures (commercialization) were never ignored completely. In 2004, the government adopted the 'Conception of Participation of the Russian Federation in the Management of Government R&D Organizations' and proposed diminishing its role. The governmentalization continued on the existing marketization policy (Graham and Dezhina, 2008, p.36).

The industrial policy focusing on the strategic sectors decided by the state initiative became the main element of the economic policy under President Putin's second term (2004-2007). The Presidential message of 2005 clearly announced the industrial policy and economic interventions for strategic sectors, and this industrial policy included the innovation policy. In 2006, the new version of the state law 'On Science and the State Science and Technology Policy' was signed by the President, and the innovation policy was regarded as a method for increasing competitiveness.[6] In 2006, the inter-department committee of the Ministry of Education and Sciences also adopted the

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[2] Fixed capital increased in the period after the dissolution of the Soviet Union (1986-1990). However, during 1991-1995, it diminished by 20.5% per year on average, and for five years, it stood at less than a third of its past value. Though fixed capital investment increased by 1990, it diminished after 1991 (Uvarov, 2013, p.33). In the early and mid-1990s, Russian science experienced a calamitous decline in funding and government support, and the brain drain worsened the situation. The crisis lasted till 2000-2001, when Putin became President (Graham and Dezhina, 2008, pp.31-32).

[3] See Graham and Dezhina (2008). 'The President`s Council for Science and High Technologies' was created in 2001. In 1997, expenditure on civilian science comprised 0.43% of the GDP, its share falling to 0.3-0.31% by 1999-2001 (Graham and Dezhina, 2008, p.35).

[4] Technology parks (namely, cooperation between research institutes and the industry, such as the Moscow Institute of Electronic Technology; such parks came into being after the collapse of the Soviet Union), innovation technology centres (the first centres were created in 1996 by the Russian government; although they were allotted significant financial resources, they were not established to the extent they should have been), special economic zones (two types of production or high-tech development existed, and these zones were classified by law), technology transfer offices for commercialization, venture companies, and other such institutions were established as new organizations (Graham and Dezhina, 2008, pp.74-80; Klochikhin, 2012, p.1627).

[5] Pr-577 included priority sectors such as information technology, space aircraft, new transportation technology, the environment, and others. Pr-578 suggested lists of important technologies.

[6] The government passed several amendments. The standards and procedure for permissions needed from municipalities pertaining to the Science City were inserted in April. In July 2015, the financial instruments for support, namely the budgeting of the 'science support funds', were included in the amendment.

'Development Strategy of Science and Innovation of the Russian Federation till 2015',[7] which considered the establishment of an effective innovation system within its mid-term plan. In 2007, the so-called 'Putin Plan' was announced as a comprehensive socio-economic policy, and the following targets were included in it: modernization of the society and economy, improvement of social and life standards, and creation of a competitive economy. In parallel, in 2007, the Ministry of Education and Sciences drafted the 'Comprehensive Programme on Science and Technology Development and Technological Modernization of the Economy in the Russian Federation till 2015', which pointed to the need for a state-led policy (Ministry of Education and Sciences RF, 2009).

In February 2008, President Putin emphasized the importance of drafting the 'Development Strategy of Russia till 2020', which also involved modernization. President Medvedev also adopted this Strategy, and the growing sense of the crisis resulting from the 2008 financial shock stimulated modernization. As a result, the 'Concept of Long-term Socio-economic Development till 2020' (N1662-r in 17th November of 2008) became the core of the economic policy.[8] This Concept envisaged a decrease in the share of the oil and gas sector in the total value added from 18.7% in 2007 to 12.7% in 2020, and the share of the innovation sector was expected to increase from 10.9% to 17% in the same period. In May of 2009, the Council for Modernization Committee was organized to promote and oversee breakthroughs in the innovation sectors of energy efficiency, atomic power, space technology with telecommunications, medical technology, and strategic information technology. The Presidential message of 12th November 2009 also referred to these five strategic innovation sectors.[9] President Medvedev's government thus drove modernization. The Science City, *Skolkovo*, and the selection of 'national champions' were his symbolic projects.[10]

Though the modernization policy was formally established in autumn of 2008, in response to the global financial crisis, it was put into effect in parallel with the anti-crisis policy. Both policies (modernization and anti-crisis) helped in increasing the country's growth potential and state's support. Both differ from the perspective of growth: modernization was viewed from a long-term perspective, and the anti-crisis policy was intended to lift the country out of the crisis in the short term. The 'Fundamental Principles of Anti-crisis by the Russian Federal Government in 2010' gave priority to anti-crisis measures. The first period of modernization (2008-2012) was essentially a recovery period. However, Russia swiftly returned to its intended path; in 2010, the government announced the country's recovery from the crisis, and in April 2011, it returned to its policy of modernization. However, after the heated controversy over modernization, 'Strategy 2020' was published in March 2012. It emphasized the need for growth based on innovation and the development of human capital.

At the very least, the innovation policy demands a wide range of measures to help Russia's economic development. Provided the policy can direct changes in the growth path, from the traditional resource-based notion to the knowledge-based one, innovation can potentially change the country's hard power into soft power.

3. The perspective of the innovation strategy

Innovation is the central concept of modernization. The Ministry of Economic Development of the Russian Federation drafted 'Innovation Russia 2020'[11] in January 2011, and the government adopted the new policy titled 'Innovative Development Strategy to 2020' (approved on 8th December 2011, No.2227-r, hereafter the 'Development Strategy') and the 'State Programme for Science and

[7] Please see the 'Fundamental Direction of the Russian Federation Policies in the Sphere of Innovation Development by 2010' (introduced in 2005).

[8] The Concept was drafted by the Ministry of Economy and Trade. It expressed Putin's plan and policies as part of those of the Medvedev government.

[9] *Ekspert,* No.44, 16th-22nd November 2009.

[10] The federal law on innovation centres or *Skolkovo* (passed on 28th September 2010) determined privileges.

[11] 'Innovation Russia 2020' consisted of 20 tasks in 8 fields, and included the following: adaptation to globalization, creation of infrastructure (via Russian technology development funds), effective science, regional development, and politics (adjustment function).

Technology Development' (20th December 2012). The latter programme can be regarded as specifying the tactics to be followed for fulfilling the Development Strategy and determined that 3% of the GDP must be directed to R&D till 2020 for the upkeep of the fundamental sciences and to finance selective fields. The following background conditions strongly affected this strategy's adoption: Russia needed to intensify its own competitiveness to achieve accelerated global technological progress; the global competition (brain drain) was severe; the country faced daunting challenges posed by global issues such as climate change, its aging society, poor hygiene, food security, and other reasons; and Russia had not fulfilled the mandates of the programmes drafted till 2010. In particular, the 2008 global financial crisis caused various difficulties in the implementation of previous policies, private investment in innovation diminished, and Russia was exposed to structural instability.

The Development Strategy was drafted in parallel with other important strategies such as energy and transportation, and it was linked with the state's science and technology development, education, information society, and other programmes. The strategic driving organizations were state-backed venture funds and technology funds supplied by the Development Bank, External Economic Bank, and *Rusnano*.

Russia's Development Strategy was characterized by quality and quantity. The following points were decided upon as quantity-relevant targets: an increase of the share of innovation enterprises from 9.4% in 2009 to 40-50% in 2020, expansion of Russia's share in the world high-tech products export market from 0.25% in 2008 to 2% in 2020, a sharp increase of the innovation products ratio in industrial production from 4.9% in 2010 to 25-35% in 2020, R&D expenditures increase from 1.3% in 2010 to 2.5-3% in 2020, and an increase of the number of patents filed by Russia. The important strategic tasks included the maturing of human potential in the innovation sphere, increasing innovation activity in business, organizing stable R&D departments, opening up the economy to the global market, and creating innovation clusters and technology platforms.

The Strategy devised three scenarios. The first touched upon import-oriented technology development by inertia, where the domestic innovation potential declined, and Russia intensified its dependence on foreign countries. In this scenario, domestic demand to innovation was low, and the state's support policy was preserved. As a result, Russia would lag behind not only developed countries but also emerging economies. The second scenario referred to catching up and local competition and was based on imported technology and its domestic production. This strategy referred to the East Asian model in Japan, Korea, Malaysia, Singapore, and others, and the role of the government in modernizing R&D was large. In this case, the most advanced technology was hard to import, leading the country to increase its import dependence and totally rely on imports. The third strategy referred to the leading model in the initial science and technology sectors and fundamental research. Russia was potentially competitive in space and aircraft technology, nano technology, complex materials, atomic power, hydrogen energy, and biomedical technology. The risk of Russia following the first scenario (by inertia) was high. This scenario was not comprehensive enough for the country's goals, and a combination of the second and third scenarios appeared to be the best option.

The Development Strategy was implemented in the following two periods. The first period (2011-2013) saw an increase of economic sensibility to innovation, and the government heightened the previously poor interest in innovation by facilitating measures such as budgets, PPPs, education investment, and support to innovation firms as well as small and medium enterprises (SMEs). The second period (2014-2020) witnessed an increase in private R&D investment and led to large-scale industrial restructuring. The innovation strategy was implemented comprehensively in various spheres such as credit guarantee, human capital, business innovation, science development, specialist education, government innovation, regional cluster formation, infrastructure, and the legal and financial sectors. However, it was difficult to implement the Strategy under the unstable economic condition, and the government was forced to delay its implementation.

In the third term of Putin's presidency and after 2012, even though the government had adhered to the Strategy (*RBK,* 23rd April 2015), the external environment further strengthened governmentalization and the domestic market's orientation. Specifically, Russia showed considerable

coercive power in the face of the Ukrainian issue. The economic sanctions from the West and Russia's own counter-sanctions caused numerous difficulties in imports and international financing, and enhanced the role of local governments. The external environment affected the economy and innovation negatively. Diminishing external economic relations brought about cancellations of military technology collaborations, military/civil technology purchases, and joint R&D, and also damaged the financial, fuel, and energy sectors (Afontsev, 2015, p.22).

The government regards the import substitution industrialization policy as part of its economic sanctions and industrial policies, both of which form the core of the country's governmentalized economic policy. The government also referred to some machine building sectors and foreign trade policy in its discussions with the Eurasian Economic Union.[12] Governmentalization and the strong hand of the state do not automatically guarantee policy efficiency. On the contrary, the risks pertaining to innovation are very high (Afontsev, 2015, p.34). Zamarev and Marshova (2015, pp.21-22) noted the ineffectiveness of import substitution. During 2009-2013, the share of imported equipment in total industrial investment was about 30%, and the majority of this share was attributed to the rubber and plastic, textile, timber processing, and transportation machinery sectors. Import restrictions and high import prices affected innovation negatively.[13] The lack of domestic goods for similar imports also did not stimulate import substitution. In December of 2014, the federal law on industrial policy was adopted to help transition the economy from one dependent on resource exports to an innovation-led economy, by organizing and promoting competitive high-technology industries. This law, however, did not contain concrete measures such as preferential financing, and thus, it did not envisage a comprehensive approach to industrial development (Rassadina, 2015, p.31).[14]

The country's worsening economic performance spurred Putin to stress on technology development as the state's priority. The National Technology Initiative was established, based on which the Ministry of Industry and Trade created the Agency of Strategic Initiatives. The Council for Economic Modernization and Innovative Development strengthened government regulations. The government adopted 'Priority Measures to Ensure Sustainable Economic Development and Social Stability in 2015' on 28th January 2015, which included actions to stimulate growth, such as assisting the development of strategic companies and SMEs as well as supporting specific industries and enterprises. The law titled 'Implementation of Russia's Innovative Development Strategy in 2015-2016' came into force on 12th March 2015. However, while the Development Strategy continued to function under the sanctions, the plans did not include concrete measures for financing and support, and the new version of the 2030 Strategy looked opaque.

4. State-led innovation policy

Russia's innovation policy is imbued with state-led character. Expenditure is financed by the government, innovation is promoted by building legal institutions and a policy framework, and the government places priority on industrial policy and infrastructure. The above processes characterize Russian innovation as being state-capitalist.[15] All the drivers have been instituted by the government (Uvarov, 2013, p.94). Large-scale state corporations and vertically integrated state-owned enterprises have played the leading role in innovation. However, this state-led process does not mean that the state's motivation to innovate has increased. Rather, the state has weaker motivation in this regard compared with foreign multinationals. The low interest in market-led R&D and insufficient high-tech management negate the efficiency of the state's regulations and interventions (Uvarov, 2013, p.74).

[12] The government established the Import Substitution Commission (for civilian as well as military industrial sectors) in August 2015. The government decided its tasks on 10th February 2016.

[13] The government regards dependence on foreign technologies in the following industries as critical: machine tools and equipment manufacturing, power engineering, and oil and gas equipment engineering (The Council for Economic Modernization and Innovative Development, 19th December 2014).

[14] The government established an industry development fund within the Russian Foundation for Technological Development in August 2014.

[15] See Mizobata (2015).

State-led interventions can be direct or indirect (Uvarove, 2013, pp.74-89). Direct interventions include innovation by state-owned enterprises (state corporations), protection of property rights, financing, conducting fundamental and applied research, instituting the education policy, deciding on the state's policy and contracts, and others. The government chooses the sectors that the state will support. In January 2016, these sectors included the automobile industry, transporting machinery, light industry, construction, and agriculture. Backed up by federal laws, the Federal Targeted Programmes became an effective control tool for innovation, and in 2011, the government invested 922 billion Roubles in 57 programmes involving advanced technology, the national technology base, the space programme, R&D on priority directions for science and technology development, development of education, etc., thereby stimulating private business.

Indirect interventions include the following measures: taxation and accelerated depreciation, creation of and support to innovative SMEs, preferential treatment for innovators, creating innovation infrastructure, and others. For example, concrete measures were devised with regard to tax preferences in June 2007, tax-related amendments (reduction and exemption of VAT, exemption from profit stemming from R&D, and tax simplification for free economic zones), a special depreciation system, investment preferences, SME development (a law was passed in June 2007), state support from the Ministry of Economic Development, the creation of the 'Fund for Promotion of Development of Small Businesses in the Scientific and Technological Sphere', and venture funds. The term 'infrastructure' included technological parks, business incubator zones, technology transfer centres, and cooperation between the industry and academia.

As far as the state's intervention is linked with industrial location, the policy is applicable on a regional scale. Particularly, specific cities, such as scientific cities (*Naukagrady*), have become drivers of innovation (Kuznetsova, 2015). Scientific cities came into existence by the federal law and presidential decree of 1999, and were designated by the following criteria: the ratio of the number of employees engaged in science to the total number of local employees exceeds 15%, and the ratio of the number scientific technological products to the total number of products exceeds 50%. Besides the officially designated cities, Russia has de facto science cities, and innovation support is provided on a regional scale. Most of the scientific cities were designated as such based on their agglomerations during the existence of the Soviet Union (1930-1980s) and the post-Soviet evolution. Atomic power, aircraft building, munitions, and electronics were designated as the main industries in these scientific cities (Akinfeeva and Abramov, 2015).

PPPs were also led by the state. Even though Russia lacked a balanced partnership between private business and the state, a PPP development centre was established in June 2008. PPPs were inefficient owing to insufficient support from the state, poor organization, and corruption. Further, the legal status of PPPs clearly contrasted with the global standard (Emel'yanov, 2013, pp.255-259).

State-led innovation is based on the National Innovation System (NIS), in which the government provides institutions, organizations, and policies in the fields of education and industry. Therefore, the NIS is determined by institutional and organizational factors such as enterprises and industrial organizations. Russia was a latecomer with regard to developing an NIS.[16] In the 2000s, there was much consideration and argument over the 'Concept of Long-term Socio-economic Development till 2020' (2008), which regarded effective NIS formation as indispensable for improved international competitiveness (Ministry of Education and Science, 2009). The NIS in Russia requires the creation of research institutions and infrastructure by the government. It has a mandate over the education, R&D, service, entrepreneurship, and innovation infrastructure sectors (information, organization, and finance), as well as scientific cities and their organizations, and governmentalized enterprises (Akinfeeva and Abramov, 2015, p.136).

The state-led innovation and modernization in the 2000s was rooted in Russia's need to transform the NIS. 'The backwardness of Russian innovation was based on a variety of problems. First, the domestic business lacked the needed drive for innovation and the required institutions, and most of them were used to appropriating capital in a non-competitive environment aimed at rent-seeking.

[16] The Russian NIS is based on the U.S.' experience (Ministry of Education and Science in Russia, 2011).

Competition in the Russian markets was linked with administrative resources rather than innovative products. Therefore, the NIS was fragmented, and there existed institutional gaps in education, science, and business. As a result, innovation education" did not become a top priority, and education was instead characterized by negative trends' (Emel'yanov, 2013, p.6). In short, the lack of competition and poor institutional framework govermentalized the NIS, ensuring its inefficiency. On the contrary, 'Innovation Russia 2020' provides an impetus to not only state-led policy but also competitiveness through novel human capital development, PPPs, and other such initiatives. As the Russian NIS was based on a strong belief in the state, the traditional domestic-oriented network (Fonotov, 2015), and hypertrophied state intervention, the evolution of Russian innovation policy and its implementation can be regarded as being path-dependent (Klochikhin, 2012).

5. The reality of innovation in Russia

This section observes the real evolution of innovation in Russia.[17] We may regard the year 2009 as a turning point for Russian innovation. It is no exaggeration to say that the global financial crisis hastened innovation. Innovation-related investment increased, and not only new products but also new innovation indicators, such as ecology innovation, were accepted (Gokhbrg, 2011; Ivanov et al., 2012, p.25). The number of companies having their own R&D departments also increased.[18] Specifically, R&D expenditure grew during the 2000s (Figure 1), with the R&D expenditure of industrial enterprises increasing by 3.3 times during 2005-2011. As a whole, even after making allowance for the inflation rate, R&D expenditure has risen considerably since the end of the 1990s. However, this increase may be an overestimate as the share of the GDP has been remarkably stable at just 1%, which is only half of the OECD average and smaller than that of the other emerging countries. Moreover, the contribution of businesses to R&D expenditure was extraordinarily low (0.3% of the GDP), and such expenditure was completely dependent on the state (in terms of the budget and non-budget expenditure). However, its share is increasing. Thus, the R&D financing flow is governmentalized (Figures 2).

An analysis of the distribution of innovation expenditure by the industrial sector indicates that manufacturing accounted for about 80% of the same in 2013, followed by coke and oil products (25.9%), transportation equipment (13.1%), and chemical, metallurgy, and electronic equipment. Although the industrial contribution (including that by state-owned enterprises) is relatively high,[19] most of the funds are directed toward the purchase of machinery and equipment, and expenditure solely dedicated to R&D is restricted to about 20%.

An increase in R&D expenditure, however, is not directly connected with enhancing Russia's innovation ability. The term 'service trade balance' refers to international value transfer concerning innovation. Russia recorded a remarkable expansion in excess imports (Figure 3). Ironically, gains from oil and gas are used for financing technology transfer as well as importing machinery and equipment. Notably, some activities, such as machinery design, leasing, and servicing, continue to be dependent on foreign sources.

The number of innovation enterprises is considerably small (Figure 4). Therefore, there are large innovation gaps between the public and private sectors. 'Russia's innovation policy remains unusually focused on direct support of publicly owned organisations, which perform almost 75% of all R&D' (OECD, 2014, p.120). More than two-thirds of overall R&D expenditure was financed by the government in 2009, and the private sector contributed only 26.6% (Figure 2; Gokhbrg, 2011, p.31). This public–private structure is exactly the opposite of the situation in many other OECD countries.

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[17] The data in this section are sourced from Fonotove (2013, 2015), Gokhbrg (2011), Ivanov et al., (2012), OECD (2014), and Rosstat.

[18] While the *Skolkovo* innovation hub can be regarded as a restricted R&D centre, it has developed as a greenfield project.

[19] The contribution of businesses to the overall innovation expenditure was 79% in 2005 and 63% in 2013 (Rosstat, http://www.gks.ru, accessed 31st October 2015).

The number of staff engaged in R&D declined. In practice, during 2000-2012, the number of research staff decreased by 18%, confirming the remarkable brain drain. Brain drain also distorts the age structure of the researchers. Figure 5 shows a sharp reduction in the number of middle-aged staff engaged in R&D. It appears that people with potential to conduct good research left the country for greener pastures. In addition, many enterprises use outdated equipment. Thus, Russia's innovation level cannot be regarded as globally competitive.

However, we observe a positive trend in innovation after 2009. Figure 6 indicates innovation products by industry, and we note that transportation machines and oil products lead Russia's innovation, albeit these sectors experience foreign-led innovation. Investment also shows an encouraging innovation trend. Investments in the oil refining, chemicals, machinery, automobile, electric power equipment, and defence sectors showed a sharp increase and outperformed the machine building sector. Among them, although the automobile sector has been traditionally dependent on the foreign markets (as a source), an increase in the localization of accessories production can be observed. Russia's high-tech sectors can be divided into the information technology (IT), aerospace, special machinery, electronics, atomic power, pharmaceuticals, and air transportation sectors (Frolov et al., 2015; Koshovets and Ganichev, 2015). In 2013, Russia's domestic companies produced 65% of pharmaceutical titles noted in the list of strategically important medicines. Biomedical technology has also made substantial progress (The Council for Economic Modernization and Innovative Development of Russia, 16th May 2014).

During 2001-2012, the production from high-tech sectors grew 2.72 times compared with total industrial production (1.58 times). Particularly, after 2005, high-tech sectors reported accelerated growth, with the aerospace and special machinery sectors contributing to a major portion of this growth, which was based on export expansion. The demand for high-technology products, however, is based on the budget (such as defence order and the Federal Targeted Programme (54 % in 2011)), and this share tends to increase. Notably, the state has had its share of problems such as opaque prices and corruption. On the contrary, progress at the civilian end has remained stagnant; aging equipment does not help increase demand. Thus, high technology is also governmentalized, and an uncompetitive market does not stimulate innovation.

According to the monitoring survey on the innovation activity of the Russian manufacturing and service sectors by the Higher School of Economics in 2009-2012 (Kuznetsova and Rud, 2013),[20] few enterprises regard innovation products and new products as priority and as offering a competitive advantage, respectively, because they target the domestic, particularly local, market. They do not aim to sell in the international market, and hence, the competition is not as strong.

The following factors influence innovation negatively: a fragile national innovation system, inefficient and insufficient R&D expenditure, and low resource inputs into research fields. Like the in-transition economies, Russia recorded a relatively low ratio of R&D expenditure to total innovation expenditure, with most of it flowing into the renewal of fixed capital. In short, investments occurred from a short-term view. As they lack their own development capacity, investment does not aim at innovation (such as the development of new products), and instead, strengthens import dependence. As a result, the country harms its own endogenous development capacity.[21]

With regard to the views of Russian companies on innovation, organizational innovation and marketing innovation are perceived to be weaker than technological innovation.[22] As for organizational innovation, even though more than 60% of enterprises implement reforms in terms of

[20] In addition, I use information from the questionnaire surveys provided to top managers in 2005 and 2009 by the High School of Economics (Gonchar, 2014, pp.195-221).

[21] In the low-technology sectors, enterprises are accustomed to utilizing the existing technology, and they do not aim for innovation (Kuznetsova and Rud, 2013, p.94).

[22] Organizational innovation requires new business procedures, organization of shops, improvement in external relations, and reductions in management and transaction costs. Marketing innovation means changing the marketing, design and packing, and sales methods, and creating a new value strategy. Three and a half percent of Russian enterprises introduced new organizations, and 2.5% of enterprises implemented marketing innovation. Both cases record smaller numbers than that of total innovation (Kuznetsova and Rud, 2013, p.98).

employee improvement and quality management, enterprises are conservative with regard to new reforms such as strategic alliances, changes in governance, establishing R&D departments, and flexible labour hours. As for marketing innovation, traditionally, Russian enterprises have disregarded marketing and skill formation; thus, specialists have become indispensable. Though enterprises have been known to undertake organization and total innovation as well as improve management performance, the levels differ by industry. Innovation is strong in the equipment, IT, metallurgy, electronics communication, and automobile industries, and weak in the light construction and chemical industries (Kuznetsova and Rud, 2013, pp.91-101).

About 59% of industrial and 34.3% of service enterprises in Russia are known to copy existing products and technology. A few organizations have interest in organizational reform and new products. However, this ratio is small (26.5% and 15.7% of industrial and service enterprises, respectively). Moreover, few enterprises have a long-term innovation strategy. In any case, the innovation strategy should be redesigned every five years, but many reconsider it within one year or six months. In short, the Russian enterprises have a short-term outlook on business growth.

Despite experiencing economic growth in the 2000s, Russia has shown confused trends. On the one hand, Russia has improved innovation activity in terms of scale and quality. However, the results of its innovation policy should not be overestimated. The innovation process remains underdeveloped in scale and quality compared with the other OECD countries. The macroeconomic data and microeconomic surveys clarify Russia's backwardness and path-dependent evolution, which is still in transition. In reality, innovation in Russia is based on a strong bias to the state and govermentalization.

6. Market quality and market players as innovation determinants

6.1. Innovation and market quality

The most reliable indicator for a comparative analysis of innovation is the Global Innovation Index investigated by the World Intellectual Property Organization (WIPO) and INSEAD, a business school based in Europe. In global terms, Russia ranks in the middle of the scale. Despite the global financial crisis and economic sanctions, Russia has made significant progress. In 2015, it was ranked 48, up 14 positions from the 62nd place in 2013 (Figure 7). WIPO and INSEAD calculate the Global Innovation Rankings using sub-indexes (seven pillars). This analysis clarifies the characteristics of Russian innovation in terms of comparative advantages and disadvantages. The striking advantages are human capital, research, and domestic knowledge creation. As the inheritance of a socialist system, education may well support the fundamental base for innovation. On the contrary, Russia ranks rather poorly in terms of institutions, infrastructure, market sophistication, and creative outputs. In particular, political stability, rule of law, ecological sustainability, credit, and intangible assets have been identified as considerable weaknesses (Figure 8). In short, market quality/market institutions become a decisive determinant, weakening Russia's attempts at innovation.

Generally speaking, innovation is indispensable for global growth as it leads economic dynamism, thus creating a positive chain reaction. In the capitalist economy, the innovation process is characterized by decentralized initiatives, gigantic rewards, competition, extensive experimenting, and reserve capital (Kornai, 2014, pp.15-18). Also, innovation is based on collaborative and sound innovative entrepreneurship and financial support (Schumpeter, 1947 [1989]). Sound markets are indispensable in converting technological progress into innovation. In short, high quality markets are a must for innovation.

Market quality[23] refers to market efficiency as well as fairness in pricing, resource distribution, and transaction, and can be regarded as following an endogenous market theory. Quality level may be defined by the institutions that change markets and infrastructure. Market infrastructure denotes 'the entire network of social arrangements in which a market functions' (Yano, 2010, p.174) and is determined by dual institutional factors. The primary infrastructure consists of rules and laws that

[23] See Yano (2008, 2009, 2010, 2014).

govern markets, while competition under fair rules determines market quality. The secondary infrastructure functions to improve the applicable rules and laws and provides a set of conditions for enforcing them. However, much depends on the awareness of the rules, the sophistication level of market participants, cultures and subcultures, organizational arrangements, corporate governance, and customs and traditions (Yano, 2009, pp.11-13; Yano, 2010, pp.175-176). A high-quality market results from the proper coordination of market infrastructure. Infrastructure is indispensable for markets, and poor market infrastructure or faulty coordination deteriorates market quality and causes economic crises. As innovation – particularly financial innovation – causes inefficient asymmetric information and adjustment failures pertaining to market infrastructure and good governance, infrastructure must be able to reorganize itself using the progress brought about by the IT revolution. In this context, the 2008 global financial crisis can be regarded as a result of poor coordination with market infrastructure and worsening market quality (Yano, 2009, 2010).[24] With regard to the latter, the market quality level may be determined not only in terms of the quality of market infrastructure but also by social changes such as poor coordination of infrastructure and asymmetrical information.

How can we judge market quality? What standards apply? Based on Yano (2009, 2010), we may list the following as important determinants of market quality: two strata of market infrastructure, legal institutions, information and economic players, and coordination style. Here, we measure market quality with regard to the following four requirements: the extent of marketization allowed by rules, laws, and institutions; the degree of law and institution enforcement; the specificity of economic players' behaviour and market coordination; and institutional complementarities.

First, Russia upgraded its corporate laws in the 2000s. The corporate law reform favours the liberal market because the laws protect minority shareholders. The Anglo-Saxon model became a governance model. However, state intervention has continued in Russia, and competition is restricted in a monopolistic market. The global standard on Rule of Law, the World Justice Project Index, also suggests that the country suffers from poor market quality.

Second, Russia's legal institutions are weakly protected, and there have been many cases violating formal rules and institutions. In particular, the judiciary is not as independent as it should be (OECD, 2014, p.58). The following indicators illustrate enforcement levels indirectly.

Corruption expresses the abnormal operation of market institutions. Russia ranks quite low in the Corruption Perception Index published by Transparency International, and the Global Corruption Barometer also indicates the extent of bribery. The Bribe Payer Index ranks Russia at a low level. As corruption indicates the need for 'additional costs' so that enterprises may survive, the transaction costs in the country are bound to be hypertrophied.

The World Bank's report titled *Doing Business* provides a different figure. Even though Russia does not rank as highly as the developed countries, there has been some improvement.[25] It was ranked at around 120 till 2013, and in 2016, its rank improved to 51. Notably, Russia has improved its ranking in terms of credit and electrification, but the core market institutional requirements (such as dealing with construction permits, protecting minority investors, and trading across borders) continue to be ranked low.

The World Economic Forum publishes its findings, which provide clues to judge market quality. Though it assesses the country's economic growth and market reform positively, Russia's overall evaluation becomes negative owing to political risks, failure to create export industries, and opaque import substitute strategy.[26] The *Global Competitiveness Report 2015-2016* ranks Russia in the 45th place. Though Russia bettered its rank, its evaluation in terms of institutions, goods market efficiency, and financial market efficiency has deteriorated. The above-mentioned indirect indicators clearly

[24] Yano (2010, pp.178-179) stressed that the coordination failure between the Japanese and U.S. monetary policies in 2004 fuelled a large increase in the demand for credit default swaps (CDSs), resulting in a bubble in the market for CDSs and derivatives.

[25] See http://www.doingbusiness.org/data/exploreeconomies, accessed 27th October 2015.

[26] Anders Borg, *The crack in the BRICS*, 9th July 2015, https://agenda.weforum.org/2015/07/the-crack-in-the-brics, accessed 20th July 2015.

express the fragility of market quality in emancipating transition economies. The indicators certify hypertrophied transaction costs and strong state intervention.

Low institutional enforcement results from low state quality. Market quality closely links with state quality. Taylor (2011) insisted that state capacity means power which guarantees implementation of decisions and state quality, corresponding to good governance and high service levels, wherein public servants strive for fairness and work in the public's interest. Under the oppressive Putin regime, however, both state quality and state capacity have not improved. The *Worldwide Governance Indicators* (WGI, World Bank data) investigate six dimensions of governance such as voice and accountability, political stability and absence of violence/terrorism, government effectiveness, regulatory quality, rule of law, and control of corruption. Russia's rankings in government effectiveness, rule of law, corruption, and political stability deteriorated, and there is no evidence of improvement. What causes deterioration of state quality and capacity? Taylor (2011) attributes this to organizational factors such as bureaucrats dependent on the inherited administration, civil monitoring with little interest, and organizations disinterested in public interest. So long as the Putin regime remains motivated by rent extracting, bureaucrats may well retain strong interests in the retention of such a government.

Third, state-owned or governmentalized companies have become one of the main market players, and their behaviour cannot be dissociated from government influence and rent seeking. Russia's main industries are managed by state-owned companies, such as *Gazprom* and *Rosneft*, and state financing. 'When motivation to improve the institutional environment is strongly restricted, the government enhances its behaviour of direct intervention to force economic development' (Radygin et al., 2015, p.68). As a result, there exists a specific rule between the business and the government. Capture by the state and business can be regarded as a typical response in such cases. Yakovlev (2011) regarded this relationship as an 'exchange system', which reduces risks and uncertainty in the Russian market (Yakovlev, 2015, p.64). The same relationship can be observed in the state's order. Yakovlev et al. (2010) demonstrated that although the new state order law and a fully competitive market came into force as anti-corruption measures after 2006, the law was effective for standard goods only and counterproductive for specific goods. The order was dependent on the political power of the concerned administration. Under enterprises' govermentalized behaviour (namely, reduction of transaction costs), market-oriented rules carry the risk of failure.

Fourth, international financial flow can harm domestic financing (Mizobata, 2014). The parallel existence of domestic and external financing (offshore financial flows) creates difficulties in market coordination, because many enterprises evade tax using the offshore route. When the government injects money to the enterprises' foreign debts, some debts provide direct support to domestic companies/banks. As far as this financial flow is deeply organized in the economy, market coordination is strongly restricted.

In addition, the above conditions – opaque market institutions and rules, lack of enforcement, and informal negotiated behaviour in the economy, intervention from state-dependent players and the state, malfunctioning financing, and multi-nationalization – are interlinked and mutually organize institutional complementarities. Even though transaction costs rise remarkably, economic players try to reduce costs by state intervention and state–business relations. Such relationships encourage the survival of the low-quality market. Deteriorated market quality and state intervention play a decisive role in govermentalized innovation. Enterprises respond not to market-oriented innovation but to innovations with the state's initiative and backed by the state's budget.

6.2. Market players and market quality

Markets can be characterized by demand and supply, and the above relationships express the behaviour of the supply side. The biggest feature of the Russian market is that the supply side has a driving force, and the state stands at the core of both demand and supply. On the one hand, the state (its organizations and investment) becomes a central innovator. On the other hand, state order becomes a catalyst for innovation. We can refer to the isolated innovation area of *Skolkovo* and

regional clusters promoted by the local governments as examples. In Russia, innovation is thus promoted by the state and the supply side.

Even though state investment and state supply become the main sources of innovation, the motivation is not merely state-dependent. Similar to the other developed countries, Russia's compulsory motivation for state order has little effect on innovation, and overwhelmingly vertical motivation (requests from consumers and traders) and horizontal motivation (competition)[27] have strongly stimulated innovation (Ivanov et al., 2012, pp.26-27). Moreover, huge domestic consumption and the expansion of the upper- and middle-income classes has had strong impacts on the Russian market. Based on its income, assets, social position, and self-identification, the middle-income class comprises more than 50% of the population, and it includes various groups: businessmen, state bureaucrats, managers of the state's firms, military executives, specialists, skilled young workers, managers of large- and middle-sized firms, the scientific elite, and others.[28] In addition, large cities such as Moscow and St. Petersburg show population inflow, resulting in the large 'lock-in effects of the city economy' (Ohizumi, 2011). The increase in consumption propensity and human capital formation strengthen the stimulation to innovate. A recent empirical survey (Ivanov et al., 2012) remarks that when enterprises assess innovation fairly and reflect it in their jobs, labour management, and wages, they effectively implement innovation. The demand side also becomes a strong player in innovation.

However, we cannot overestimate the above changes. The Russian middle class is highly reliant on public servants, and their market orientation is not strong (Mizobata ed., 2013). The pressure from the demand side is also weak. As the country is dependent on carbon-intensive energy sources, energy efficiency is low, and demands for energy-saving and consumption reduction are weak (OECD, 2014, pp.22-23). To improve conditions for the state- and supply-based innovation players, businesses, non-governmental organisations, a demand-oriented policy may be considered to create a competitive environment and enhance market quality.

7. Conclusion

The Russian market has stabilized after 25 years of transition, and the innovation-oriented policy has been taken seriously after the modernization campaign. Even though various kinds of policies have been drafted in quick succession, the national innovation system appears to be based on Russia's specificity and has evolved path-dependently. The government has maintained a leading position, with the traditional industrial policy taking priority over specified industries. The government's hypertrophied role has been indispensable to Russian innovation, leading it to evolve in a path-dependent manner. Moreover, detachment from the division of labour (as per international norms) clearly characterizes Russia's isolated evolution, and its joining the World Trade Organization (WTO) alone cannot fundamentally change the national innovation system.

Policy enforcement is restricted. The OECD (2014) has remarked upon lack of policy as being akin to a failing policy. In practice, the results are confusing. On the one hand, the Ministry of Economy stresses on the need for positive results. The formation of regional clusters and incubators, university and academic reforms, creation of R&D jobs under the state-led policy, and innovation investment under foreign capital have helped set a positive example of the automobile industry. However, some data and empirical surveys indicate issues due to the govermentalized structure and players, poor institutions and market environment, investment fragility, and fewer R&D players. Specifically, the traditional high level of education is not linked with innovation.

This paper characterized the constraints impeding innovation in Russia from the viewpoint of market quality. Mutual linkages of factors such as unstable institutions, lack of enforcement, bias toward informal institutions and negotiation behaviour, state-led players and govermentalization, and

[27] Horizontal innovation can be observed in sectors in which competition with foreign producers is severe.

[28] According to the 2008 survey by Sberbank, people with a monthly income of 300-400 U.S. Dollars are regarded as middle class. The Institute of Sociology of the Academy of Sciences classifies about 20% of Russian residents (28 million) as middle class (Sillaste, 2015).

poor financing have contributed to a malfunctioning market and have deteriorated market quality. State intervention and state–business relations have the potential to compensate for high transaction costs under poor market quality. The government-led innovation can be regarded as a spontaneous response to the economic players in the market. The low market quality, leading position of the state, and poor innovation levels are mutually linked. The state should act as a consumer as well as a supplier of innovation.

Though the process is based on a hypertrophied government, innovation in the global market, the infiltration of competition in the domestic market, and the strong push from consumers are inevitable. It stands to reason that Russia's innovation strategy should look to soft power because innovation needs institutional reform and intensified enforcement as well as the reorganization of the division of labour in line with international norms. The developed countries' capitalist economies provide important lessons, namely, the need for interaction to enable innovation as well as high market quality.

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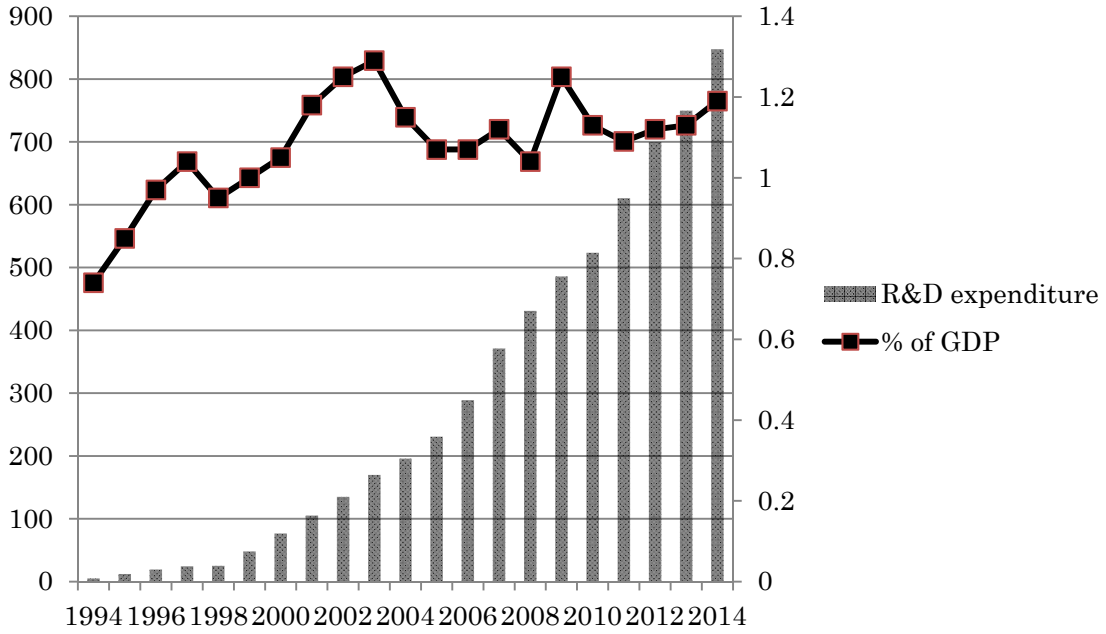
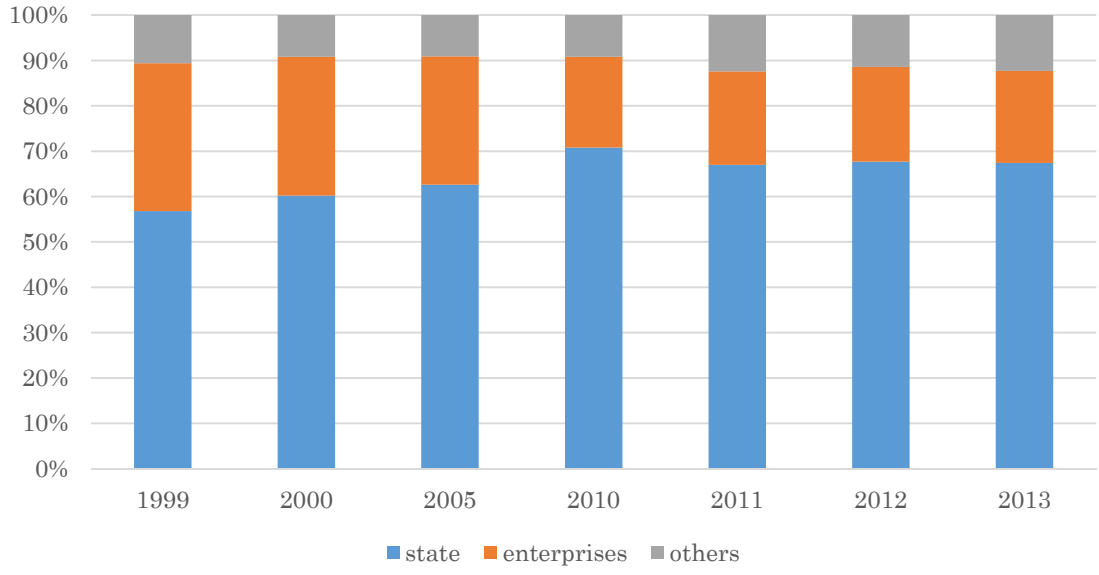
Figure 1 R&D expenditure trend



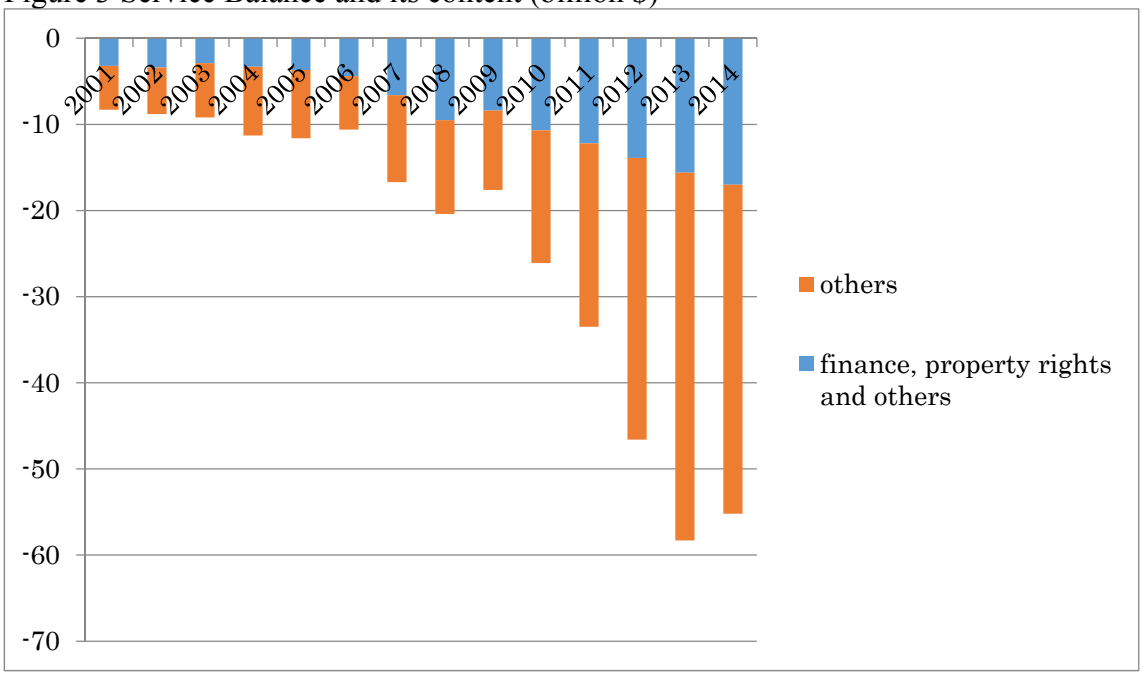
Note: expenditure by the left axis in billion Ruble, and $ in GDP by the right axis.
Source: Rosstat, http://www.gks.ru, 31 October 2015 accessed.

Figure 2 R&D expenditure by source (%)



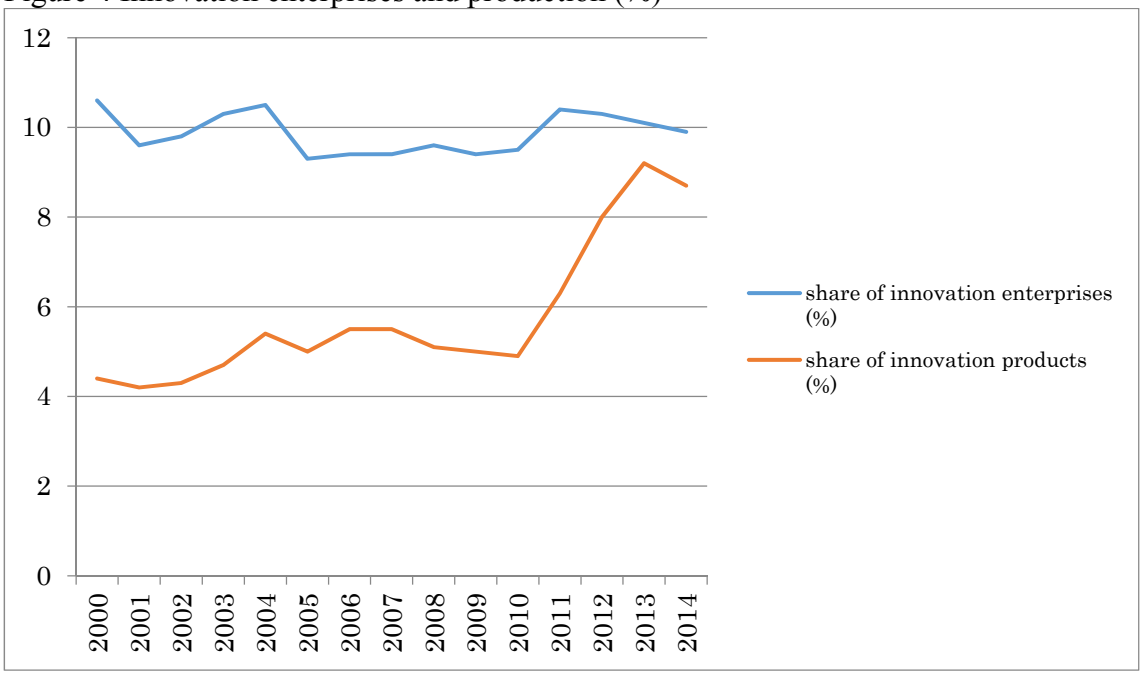
Note: state = budget + non-budget, enterprises = enterprises + foreign capital
Source: Rosstat, http://www.gks.ru, 31 October 2015 accessed.

Figure 3 Service Balance and its content (billion $)



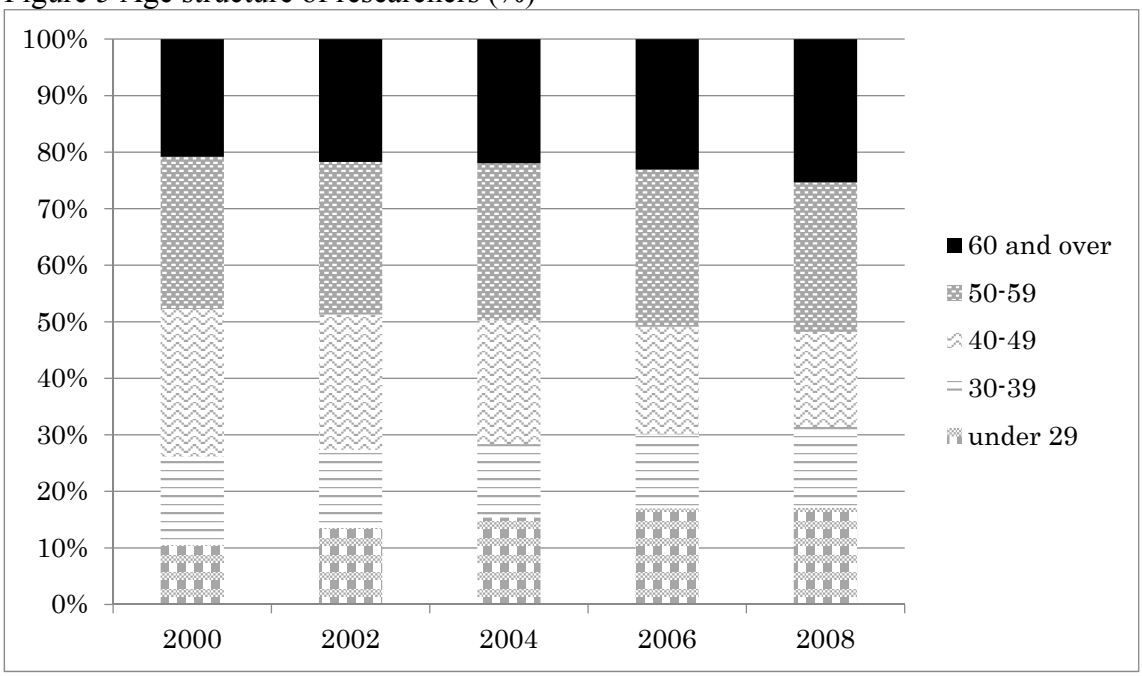
Source: CBR, http;//wwww,cbr.ru 20 July 2015 accessed.

Figure 4 Innovation enterprises and production (%)



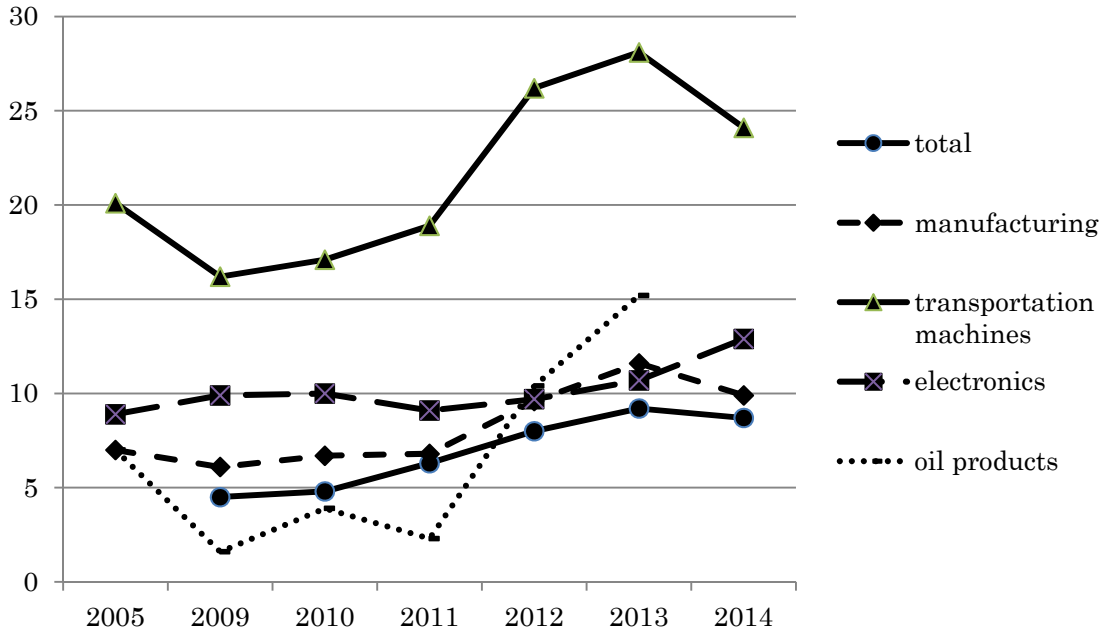
Source: Federal state statistics office, Statistics of innovation in Russia, http//www.gks.ru 31 October 2015 accessed.

Figure 5 Age structure of researchers (%)



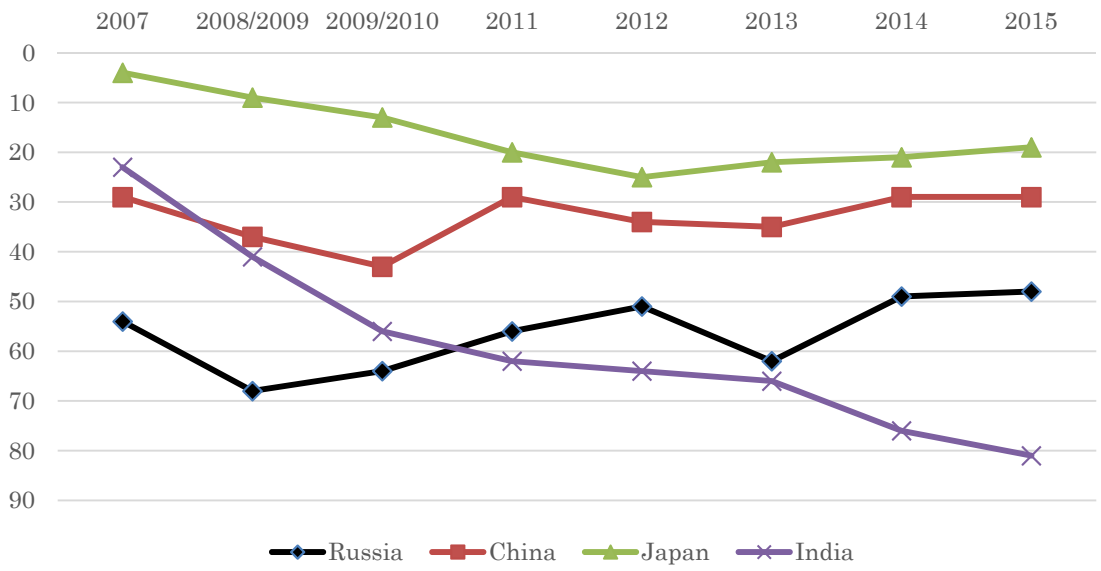
Source: Gokhbrg, 2011, p.59.

Figure 6 share of innovation products (labour) (%)



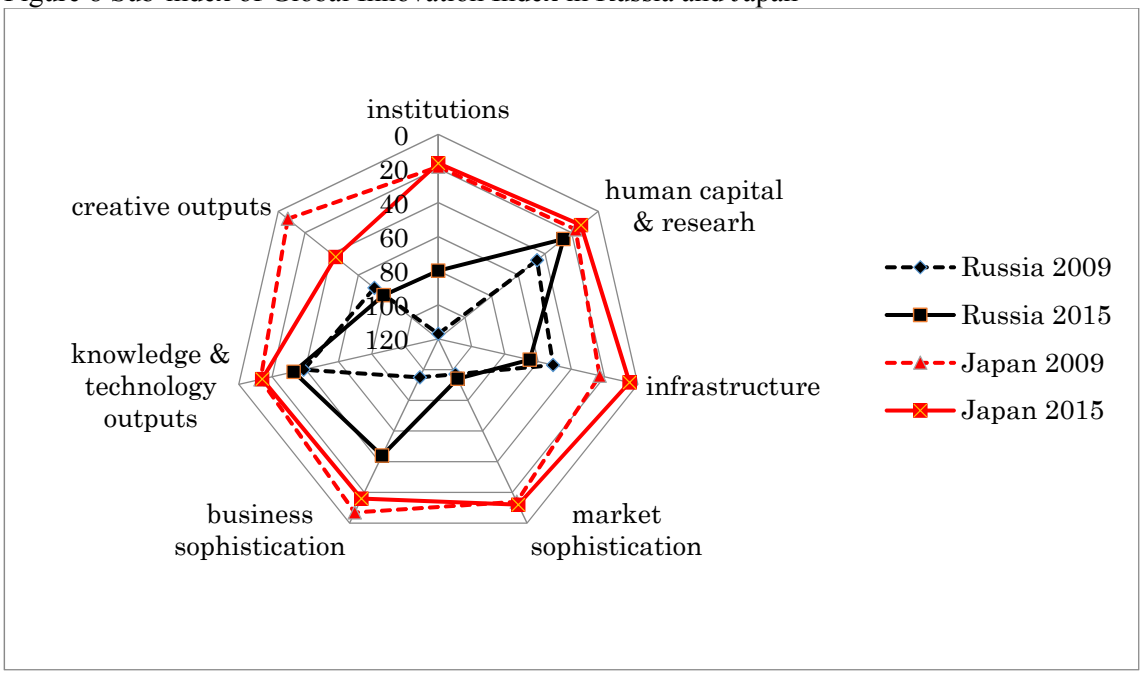
Source: Rosstat, http://www.gks.ru, 31 October 2015 accessed.

Figure 7 Global Innovation Index ranking



Source: WIPO, INSEAD, *Global Innovation Index*.

Figure 8 Sub-index of Global Innovation Index in Russia and Japan



Note: Sub-index has five pillars, and innovation output sub-index has two pillars such as knowledge & technology outputs and creative outputs.
Source: WIPO, INSEAD, *Global Innovation Index* 2009/2010 and 2015.

The State as a Stakeholder of Industrial Enterprise in Russia

Olga Bobrova[29]
Department of Economy and Management of Enterprises,
St. Petersburg State University of Economics

Abstract: In this paper you'll find an overview of interrelations between industry and state in Russia for 2000-2015 period. A need of implementation of stakeholder approach to the analysis of business engagement with the state is rationalized in the context of raising a sustainability of Russian economy. On the examples of passing three economic crisis (1998, 2008-2011, 2014-) by Russian industry we compare effectiveness of anti-crisis measures of government from the point of view of different scale enterprises. The expectations and strategies of engagement of the industrial enterprises with the state in contemporary conditions in the context of realization of industrial policy of Russian Federation and tendency of import-substitution are considered. A special attention is paid to small and medium manufacturing business based on the data collected during the survey of entrepreneurs in Northwest Russia in 2014. In this paper also the author makes an effort to find a possibility of implementation of Japanese experience in harmonization of the state's and industrial enterprises' concerns on the Russian soil.

Goal of the research: to characterize the state with its basic economic activities in 1998-2014 as a stakeholder of industrial enterprise in Russia, so the managers on enterprises can see the expectations toward business from the government side and make the relationships with state mutual and sustainable.

Methodology: literature overview, comparative analysis of influence of economic crisis on industrial enterprises, analysis of statistical data on government expenditure and Russian GDP between 2002 and 2014, stakeholder approach to manufacturing in Russia.

Key words: stakeholder, stakeholder-management, industrial policy, SME in Russia, economic crisis, GDP, government expenditure, import substitution, economy of enterprise, the state and business relations, sustainability, comparative economy.

JEL classification numbers: M14, M21, H12, H50, L26, L52, L53, L60, Q01, P31, P35, P51.

Introduction

Historically the state has played a significant role in establishment and development of industry in Russia. The government investments since 17th century through to the present days were among the main drivers of industrialization while private and foreign investments were also supported by the state during several periods of Russian economic development. The Russian state always had huge enterprises as national property and also placed governmental orders to private business and influenced it by institutional instruments. After the economic crisis of 1998 the real economic sector enjoyed significant growth, but then with one by one coming crises of 2008-2011 and 2014 many industrial enterprises suffered from dropping of the basic indexes (including profitability and investments volumes) and found themselves in a very unsustainable position. In this paper we'll see how the interrelations between industry and state in Russia were developing in 2002-2015 period, offer a new approach to analyse these relationships, demonstrate that this approach is more useful than others to evaluate effectiveness of engagement with the state from the point of view of enterprises

[29] PhD, Associate Professor at St. Petersburg State University of Economics, Department of Economics and Management of Enterprises. 191023, Sadovaya Street 21, St.Petersburg, Russia. E-mail: olbobrova@hotmail.com
In June – November 2015 an overseas visiting researcher at the Economic Research Institute for Northeast Asia (ERINA), Niigata, Japan.

and challenge the opportunities of implementation of foreign experience of government engaging in manufacturing activities – in particular, the Japanese one.

Here in Japan while working on this paper I also was engaged in a research of the Japanese stakeholder-management. It was very useful to see how Japanese companies engage with their stakeholders including the state. But turning my research focus on Russian enterprises for several times I ascertained myself that for me, who is a stranger in Japan, it seems easier to understand Japanese business behaviour than to explain interrelations between my native Russian enterprises and the government. One reason may be in the lack of literature on this topic and non-significant interest of foreign scholars to this side of the Russian economy. Another reason may be in different attitude to uncertainty in Russia and Japan. While Japanese avoid uncertainty[30], Russians feel more comfortable in uncertain conditions and you never know – what my compatriots will do next. It makes life in Russia very interesting and attractive even taking into account all current problems but very difficult to study and forecast. I just hope that the present paper will shed some light on the sophisticated object of research – a new attitude of Russian companies toward the state which is documented recently and the perception of the state as a stakeholder.

Literature overview

Russian enterprises from Soviet times have very sophisticated relationships with the state. "In Soviet times in certain sense these relationships were much more complicated than in market economy"[31]. After collapse of central planning system Russian enterprises felt sort of economic freedom but that was to a great extent chaos and no support from the government.

A review of state-business relations in 1990s is given in foreign and Russian literature – see, for example Ph.Hanson & E.Teague[32] and A.Yakovlev[33].

Professor S. Mizobata explains that in present times government intervenes in the process of foreign expansion of Russian business: "as far as Russian companies are inclined towards natural resource and infrastructure sectors, therefore state policy related to natural resources and energy sectors and foreign economic policy … become the motivation and method of transnationalization"[34]. All of the above give a lot of reasons for Russian enterprises to be tightly connected to the state and try to benefit from this situation. But in crises times those who are dependent on the government to a high extent may bear additional economic and political risks.

Professor A. Yakovlev, Director of Institute for Industrial and Market Studies of NRU Higher School of Economics (NRU HSE), Moscow, doubts that after the world economic crises on 2008-2011 a new deal was established between the state and big business in Russia[35]. Basically the state did not change its approach to business at that time – may be just started to pay more attention not only to big business, but to medium-sized private companies. But Yakovlev observes positive changes in the government attitude, and in general he is quite optimistic. Regarding the next crisis period which started in 2014, Professor S. Rosefielde proves that external shock is not a big deal for Russia[36]. Though we all know that oil prices are really what Russian economy depends on. And also several

[30] *Hofstede, G.* (2001) Culture's consequences: Comparing values, behaviors, institutions, and organizations across nations (2nd ed.). Thousand Oaks, CA: Sage Publications.
[31] *Кувалин Д.Б.* (2009) Экономическая политика и поведение предприятий: механизмы взаимного влияния. М.: МаксПресс, 2009. С. 15.
[32] *Hanson Ph., Teague E.* (2005) Big Business and the State in Russia // Europe-Asia Studies, Vol.57, № 5 July 2005. pp.657-680.
[33] *Yakovlev A.* (2006) The evolution of business-state interaction in Russia: from state capture to business capture // Europe-Asia Studies, Vol.58, Issue 7. 2006. pp.1033-1056.
[34] *Mizobata S.* (2014) Emerging Multinationals in Russia // Kyoto Institute of Economic Research Discussion Paper №899. August 2014. P. 29.
[35] *Yakovlev A.* (2013) Is there a 'new deal' in state-business relations in Russia //BOFIT Online 2013 №7.
[36] *Rosefielde S.* Kremlin Strikes Back: Russia and the West After Crimea's Annexation, Cambridge: Cambridge University Press, forthcoming 2016, chapter 7 (Putin's Economy).

basic internal economic and social problems are limiting Russian growth. They are in the process of realizing and solving, to my opinion.

The eastern neighbour of Russia Japan is interested in sustainable economic situation in Russia and seeks to diversify international economic ties. Japanese corporate governance system is network based and focused on a group of stakeholders rather than on financial markets as market-based system[37] and in our opinion Russian type of corporate governance fits more to the network type. Therefore, the Japanese experience for Russia shall be useful.

Worldwide the meaning of industrial policy is rising – in the European Union, in Japan and the USA governments have implemented encouraging measures for companies investing in manufacturing in the home countries instead of outsourcing production services from emerging markets (especially China)[38]. Some scholars propose new approach to improve the state regulation of transnational economic chains many of which have their roots in Russia[39]. The industrial policy of Russian Federation was discussed for more than 10 years and finally introduced by federal law at the very end of 2014[40]. But enterprises still don't understand why should they take risks of modernisation and what will be a reaction of the state to their initiative activities. Entrepreneurs often consider the state not as partner but as an enemy or blocking factor, obstacle in business[41]. Such misunderstanding between government and the enterprises in Russia may be overcome by implementing a stakeholder approach which implicates considering the state as one of the numerous stakeholders of a firm with own interests in business.

Strategic management implies that a firm basically exists for stakeholders who represent the society. "The idea of stakeholders, or stakeholder management, or a stakeholder approach to strategic management, suggests that managers must formulate and implement processes which satisfy all and only those groups who have a stake in the business. The central task in this process is to manage and integrate the relationships and interests of shareholders, employees, customers, suppliers, communities and other groups in a way that ensures the long-term success of the firm. A stakeholder approach emphasizes active management of the business environment, relationships and the promotion of shared interests"[42] – explain R.E. Freeman and J. McVea. From management point of view the state is not just an institute for a company anymore, but a stakeholder first of all.

Stakeholder approach moves a focus of research from the priority of the state interests to the enterprise side. In my opinion, if we take a look on the state from the business side we can understand - what really needs to be done in relations between the government and business. Below we propose to business to plan own policies to increase taxes, to engage in state-led mega-projects and other mutually beneficial activities. Treatment of the state as a stakeholder leads to discovery of the interests of the state and following them in line with other stakeholders. This approach is more practical for business than the institutional one, in my opinion.

If we try to enrich the institutional approach to a firm we may attempt to move from viewing the actors surrounding the firm as institutes to a broader concept of stakeholder-management. A company exists in the network of stakeholders and such traditional institute as government interacting

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[37] *Graaf F.J., Herkströter C.A.J.* (2007) How corporate social performance is institutionalised within the governance structure: the Dutch corporate governance model. Journal of Business Ethics, 74(2), 177-189

[38] *Кондратьев В.Б.* (2014) «Свежее дыхание промышленной политики». Электронный ресурс: (http://www.perspektivy.info/print.php?ID=284872 , 4 September 2015)

[39] *Ветрова Е.Н., Рохчин В.Е., Лапочкина Л.В.* (2015) Концептуальный подход к решению проблем государственного регулирования транснациональных технологических цепочек с российским участием в Европейской части российской Арктики // Комплексные научные исследования и сотрудничество в Арктике: взаимодействие вузов с академическими и отраслевыми научными организациями: материалы Всероссийской конференции с международным участием / сост. С.В. Рябченко; Сев. (Арктич.) федер. ун-т им. М.В. Ломоносова. — Архангельск: ИД САФУ, 2015. – С. 60-64.

[40] Russian Federal Law dated 31.12.2014 г. №488-FZ «О промышленной политике в Российской Федерации»

[41] *Верховская О.Р., Дорохина М.В., Сергеева А.В.* Национальный отчёт. Глобальный мониторинг предпринимательства. Россия 2013. СПб: Высшая Школа Менеджмента, 2014.

[42] *Freeman R. Edward*, *McVea John.* (2001) A Stakeholder Approach to Strategic Management // Working Paper № 01-02. 16.03.2001. Accessed on October 14rd, 2015. http://papers.ssrn.com/paper.taf?abstract_id=263511

with the firm can be recognised as a stakeholder, because in stakeholder-management it is stressed that every stakeholder has clear interests toward the company. The definition of institutes does not stress the stake (or at least, an interest) in developing business, while stakeholders derive from their stakes in the firms. Moreover, stakeholders are more concrete than institutions: "Stakeholders have names and faces and children. They are not mere placeholders for social roles"[43]. Therefore we attempt here to explore the stakeholders concept to the relationships between business and the state.

A unique experience of Japan in the sphere of harmonization of interests of manufacturing companies and the state is especially interesting after the great disaster in Tohoku area in March 2011. After 2011 the government and business have learned to cooperate in preventing and restoring the economy after natural disasters. A comparative analysis of dealing with nuclear disasters in three countries – USA, USSR and Japan – is given by M. Aoki and G. Rothwell[44].

Regarding Japanese approach to stakeholder management we started to research this topic from the sphere of local community engagement[45]. The state in Japan is represented not only by ministries and government agencies, but also has a strong word in business associations - Keidanren and Keizai Doyukai.

From the theory we know that a Japanese model of a firm, at least in its understanding by Professor M. Aoki, contrasts with an institutional so called Agency model of the firm which became a mainstream of theory of organization since the middle of XXth century "Clear differences are evident when they (the characteristics of the agency model – O.B.) are compared with the three duality principles for J-model (a Japanese firm model by M.Aoki – O.B.)"[46]

"Business can be understood as a set of relationships among groups which have a stake in the activities that make up the business"[47]. Therefore, in order to evaluate interactions between business and government in Russia we have to identify the list of interests and shared values which both sides pursue.

Moreover there is a need to find an instrument to measure effectiveness of interactions between the state and Russian enterprises. In order to measure the effectiveness we have to evaluate the flows which are exchanging between two actors in the economy – the state and manufacturing companies. In this paper we start evaluating with the monetary flows – the material contribution of manufacturing industry into Russian GDP from one hand and financial support of the industry from the state from the other hand.

So we may conclude this part by saying that in Russia by now there is no evaluation method to measure effectiveness of interactions between the state and industrial enterprises yet but we are on the way to discover it, I hope. Under the present circumstances the stakeholder approach may help.

Discussion and research findings

1. Three economic crises in Russia

The present research was started with analysis of economic crises which Russian enterprises suffered from during last 17 years. There were basically 3 crises in Russian economy during that period: local financial crises and default of 1998, world economic crises of 2008-2011 and the last crisis which has started last year in 2014.

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[43] *Freeman R. Edward.* (2007) Managing for Stakeholders // Darden Business Publishing. University of Virginia. 2007. Accessed on July 3rd, 2015. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1186402

[44] *Aoki M., Rothwell G.* (2012) A Comparative Institutional Analysis of the Fukushima Nuclear Disaster: Lessons and Policy Implications // Energy Policy. June 2012.

[45] *Mizobata S., Bobrova O., Fukukawa K.* (2014) CSR development and local community in Japan // Fukukawa K. (editor). Chapter in: Corporate Social Responsibility and Local Community in Asia. Bradford: Routledge. pp. 86-97.

[46] *Aoki M.* (1994) Toward an Economic Model of the Japanese Firm. Chapter in: Business Enterprise in Japan: Views of Leading Japanese Economists. Edited by Imai K. and Komiya R. Cambridge, Massachusetts, London: The MIT Press – 1994. P. 69.

[47] *Freeman R. Edward* (2007) Managing for Stakeholders // Darden Business Publishing. University of Virginia. Accessed on July 3rd, 2015. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1186402

The last crisis is the most difficult to analyse because Russian economy is still in the middle of it, but to see the experience of overcoming the last crises is very useful anyway. N. Zubarevich gives an analysis of economic difficulties which started last year from regional perspective[48].

Let's try to pursue an effort of comparative analysis of perception of government policy in times of three last economic crisis in Russia. All of them are in memory of the present business generation and they all happened to Russia already in market conditions after transition from centralized administrative system of national economy to more or less competitive institutional frame.

[48] *Зубаревич Н.* (2015) Региональная проекция нового российского кризиса // Вопросы экономики. №4 – 2015.

Table 1 - Comparison of government policy perception in times of three economic crises in Russia

Approximate years of the crises	Key points of anti-crisis actions of Russian government	Basic facts of perception of anti-crisis actions by industry	Main results of overcoming crisis
1998	Standard debt-based crisis at the end of the first wave of transformation from planned economy to market one. Rouble devaluation, banks sanitation. Rare support of industrial enterprises with social significance (in mono-towns, for example). Decreasing of the profit tax and VAT; tax-free for all reinvested enterprises' profit; liberalization of amortization policy; surrender requirements of export revenues for Roubles[49].	Disillusion with the state. Surviving in new conditions. Devaluation of the Rouble gave an option to enterprises to decrease costs in dollars and made their products compatitive on inner and international markets[50]. After the government has covered its own debts to organizations in Russia the trust to that stakeholder has risen.	The government funds from disappeared state loans markets were invested into real sector of the economy and it started to grow slowly[51]. Average energy costs of domestic production in 1999-2000 have decreased as the state postponed the growth of prices of energy products produced by natural monopolies and this situation together with other positive factors has contributed to improving investment climate in Russia.
2008-2011	Reserve funds using to cover budget deficit. Significant support of large enterprises. Decreasing direct taxes[52], so the share of indirect tax (such as VAT) revenue increased in GDP – see a comparative graph on Figure 1.	Mild effect on industry due to using of stabilisation (reserve) funds by government	Quick and intensive reaction of the industry to the world economic crisis using the experience of 1990s. Restoration of the economic growth and investment activity of enterprises.

[49] *Рязанов В.Т.* (2015) Импортозамещение в России: возможности и перспективы. Часть 1. // Бизнес-информ. Информационный бюллетень СПб торгово-промышленной палаты. Апрель-июнь 2015 №2 (49). С. 18-19.
[50] *Кувалин Д.Б.* (2009) Экономическая политика и поведение предприятий: механизмы взаимного влияния. М.: МаксПресс, 2009. С. 208.
[51] *Кувалин Д.Б.* (2009) Экономическая политика и поведение предприятий: механизмы взаимного влияния. М.: МаксПресс, 2009. С. 209.
[52] *Сафрыгин К.Н.* (2015) Оценка эффективности мер по преодолению кризисов в российской экономике // Вестник Челябинского государственного университета. 2015. № 8 (363). Экономика. Вып. 48. С. 175–182. С. 178.

2014-…	Cut-offs of inefficient government expenditure [53] . Limit of the state and municipal purchase of imported machinery and medical goods [54] to support import substitution. State Industrial Policy Law[55]. Business development measures. New rules of enterprises support - credits of the state banks only for guaranties of compatible manufacturing in world prices (including energy) in order to overcome industrial backwardness[56].	- Queries from some enterprises to government to help with heavy debts in dollars and euro - Enthusiasm because of Industrial policy implementation - Expectations connected with infrastructural mega-projects - Efforts of import substitution - Tough critics of Central Bank and Ministry of Economic Development anti-crisis measures	to be seen in 2016 and later

[53] *Сафрыгин К.Н.* (2015) Оценка эффективности мер по преодолению кризисов в российской экономике // Вестник Челябинского государственного университета. 2015. № 8 (363). Экономика. Вып. 48. С. 175–182. С. 179.

[54] Russian Government Act dated 14.07.2014 №656 «Об установлении запрета на допуск отдельных видов товаров машиностроения, происходящих из иностранных государств, для целей осуществления закупок для обеспечения государственных и муниципальных нужд». Russian Government Act dated 05.02.2015 N 102 «Об установлении ограничения допуска отдельных видов медицинских изделий, происходящих из иностранных государств, для целей осуществления закупок для обеспечения государственных и муниципальных нужд»

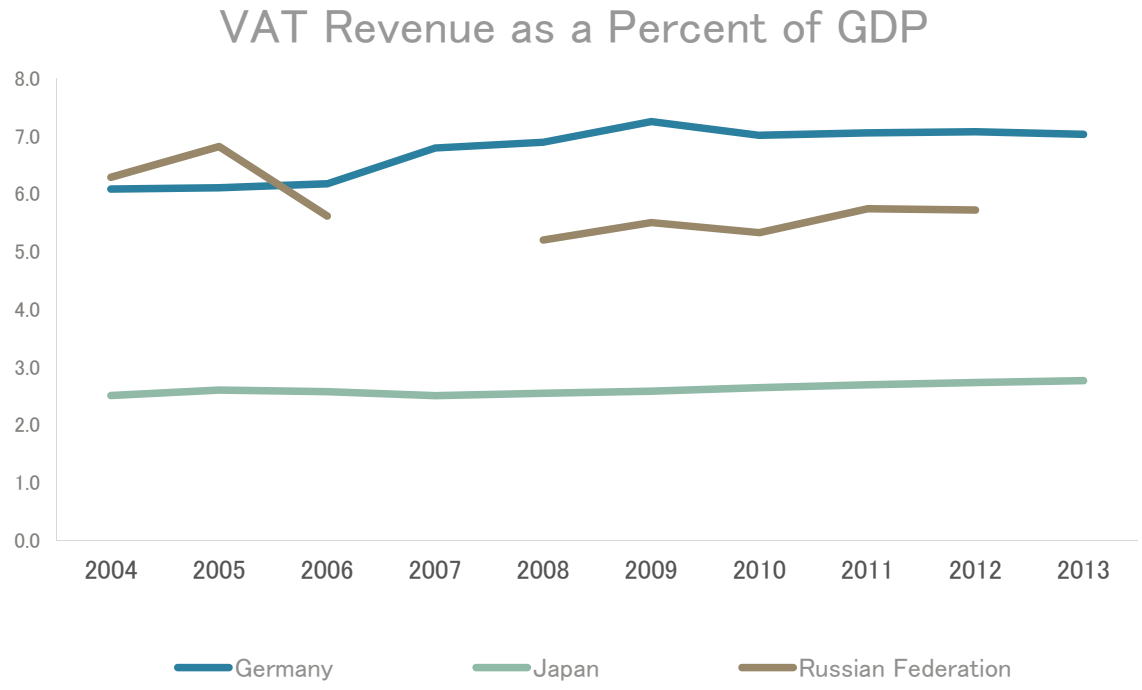
[55] Russian Federal Law dated 31.12.2014 г. №488-FZ «О промышленной политике в Российской Федерации»

[56] *Улюкаев А., Мау В.* (2015) От экономического кризиса к экономическому росту, или как не дать кризису превратиться в стагнацию // Вопросы экономики. №4 – 2015. С.5-19.

Analysing the conditions of restoring growth which has started in the 21st century D.Kuvalin writes that "in other words, a starting jerk of Russian economy in 1999-2000 in significant part was paid by the population"[57], as the factual monetary income of Russian people has significantly dropped after the crisis. But starting from 2000 the income again started to grow along with high oil prices on world markets. The behaviour of enterprises in crisis conditions is defined by experience of managers – starting from Soviet experience of dealing with the state in different forms and including the recent skills of adopting to negative influence of past crisis on world and domestic markets.

On Figure 1 we can see a different significance of VAT in economy of Russia, Germany and Japan and a change in VAT revenue in crises 2008-2011 years. USA do not impose VAT on federal level at all. For 2007 IMF just does not have proper information for Russia – that's why a section between 2006 and 2008 is empty.

Figure 1 - Share of VAT revenue in GDP in Germany, Russia and Japan in 2004-2013 (%). Share of corporate income tax revenue in GDP in Germany, USA, Russia and Japan in 2004-2013 (%)

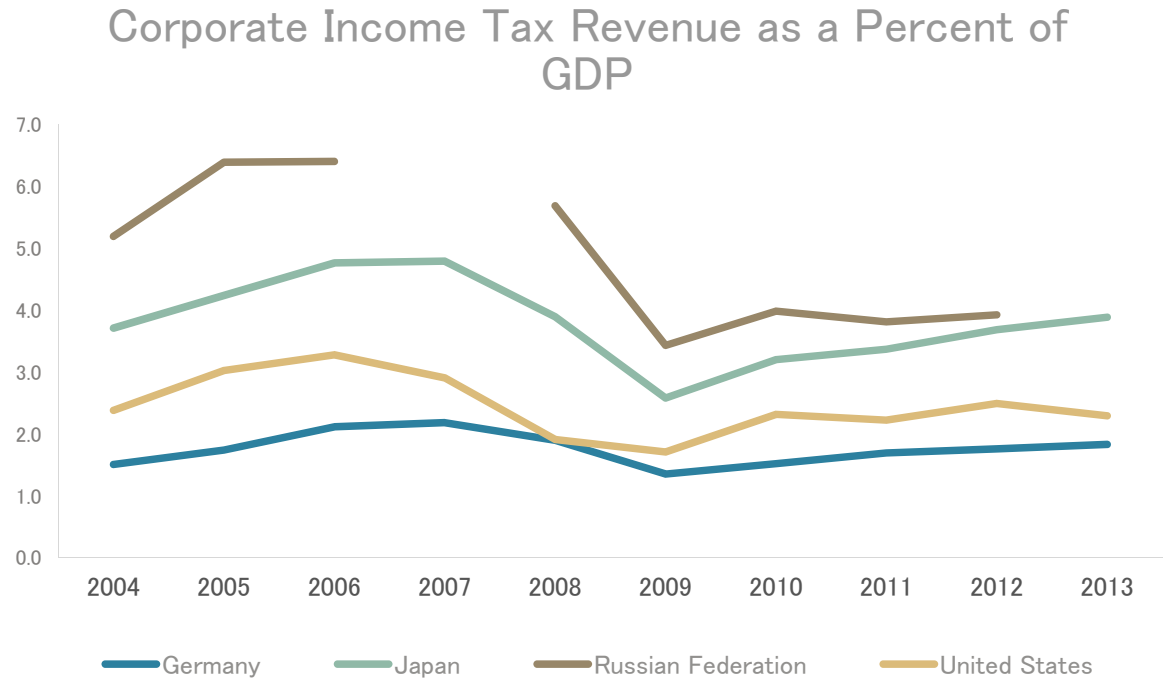


Source: World Revenue Longitudinal Data by International Monetary Fund (http://data.imf.org, 28 September 2015).

At the same time a share of direct taxes (for example, corporate income tax – profit tax) in Russia as in the most countries in world crises has decreased (see Figure 2).

[57]*Кувалин Д.Б.* (2009) Экономическая политика и поведение предприятий: механизмы взаимного влияния. М.: МаксПресс, 2009. С. 210.

Figure 2 - Share of corporate income tax revenue in GDP in Germany, USA, Russia and Japan in 2004-2013 (%)



Source: World Revenue Longitudinal Data by International Monetary Fund (http://data.imf.org, 28 September 2015).

The conclusion can be made that a crisis may be overpassed by different tools of government and industry itself. Usually the industry perception of government measures is critical and unfriendly. But in 2014 with overall rise of patriotism in Russia businesspeople pay more attention to the government actions and even sometime feel enthusiasm in connection with the industrial policy introduction, for example. Basically each enterprise chooses its own way of exit from the crisis situation.

Last year export from Russia has dropped by 5,1% and import – by 9,8%[58]. The biggest loss was noted in trade with Ukraine – 29,6%, European Union (9,7%) and Japan – 7,3%. At the same time the potential of investments into Russia from Asia is still significant – Japan and China are among leading world creditors[59]. Although it's clear that Asian capital sources are not easy solutions but in case of continuity of the sanctions, Russian companies will not have other ways for medium term.

The indices of entrepreneurial confidence of manufacturing organizations (excluding small enterprises) in 2014-2015 are presented on Figure 3.

Russian Federal Statistics Service explains: "Entrepreneurial confidence index is a qualitative indicator which permits on the basis of manager's responses to make a forecast of production output, stock and demand for products (order book) and thus to characterize economic activity of organizations engaged in "quarrying and mining", "manufacturing", "electricity, gas and water supply" (except small businesses)... The index is an arithmetic mean of "balance" of

[58] CURRENT STATISTICAL SURVEY for 2014. №1 (92) 2015, Moscow: Federal State Statistics Service (in English). (http://www.gks.ru, 19 September 2015). P.11.
[59] *Афонцев С.А.* (2015) Выход из кризиса в условиях санкций: миссия невыполнима? // Вопросы экономики. №4 – 2015. С.20-36.

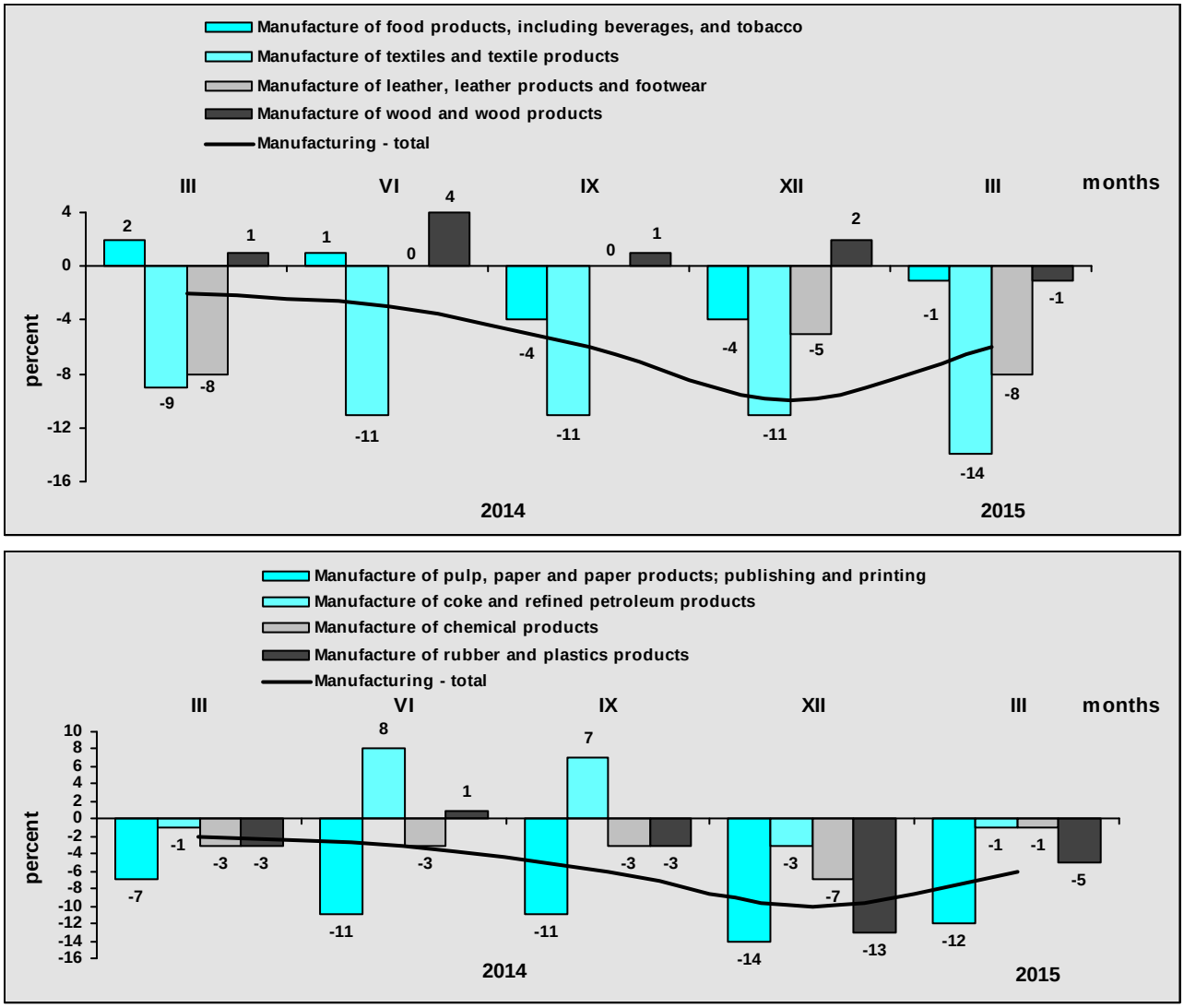
responses on the expecting production output, the actual demand (order book) and the current stock of finished produce (the latter with opposite sing).

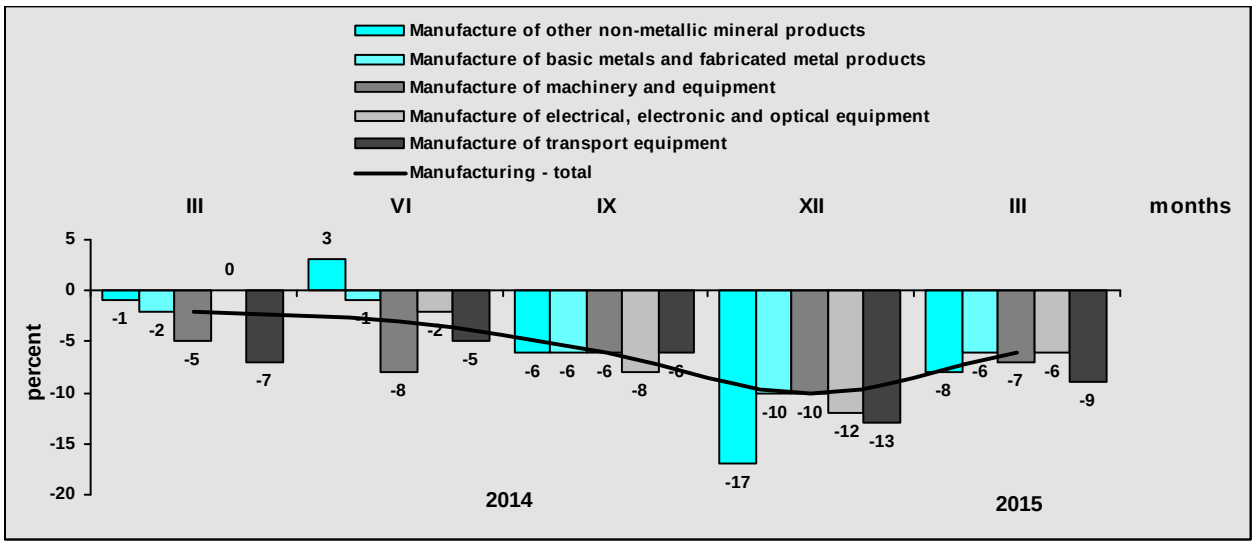
The "balance" of the expecting production output is identified as the difference between shares of respondents noted "increase" and "decrease" evaluating the perspectives of production output…

More than 3.4 thousand organizations (excluding small businesses) of "Mining and quarrying", "Manufacturing", "Electricity, gas and water supply" kinds of activities are covered by the monthly observation of business activity".

Only rare industries are demonstrating some positive perspectives of their business development. In general industrialists express a lot of worries about future of their enterprises. Such situation is typical for the moment of economic crises which Russia suffers from since 2014.

Figure 3 - Indices of entrepreneurial confidence in Russia in 2013-2014





Source: Federal State Statistics Service (http://www.gks.ru, 13 October 2015).

In 2015 the index keeps the lowest position for the longest period during all times of observation – since 1995. It means that managers of industrial enterprises in Russia demonstrate pessimistic forecasts toward the future and do not see the solution to the current problems.

As anti-crisis measures of the government which concern Russian enterprises A. Ulyukaev and V.Mau[60] mention the following:

① Rising effectiveness of natural monopolies which would lead to cost saving for enterprises;

② New rules of the enterprises support including governmental promotion of big and medium investment projects with serious multiplicative effect for the economy providing solution to infrastructural and social problems;

③ Three-years "controlling holidays"[61] for enterprises who did not break any rules during last three years – for small business this measure is already introduced[62] and comes in force from January 1, 2016;

④ Simplifying accounting requirements for small business.

Recent steps for support of small business made by government include stimulating demand through new enlarged quotas for state companies' purchase from SME – starting from 2015 Russian public corporations with sales over 10 billion Rub. must make at least 9% of their purchase from SME. Also a twice rise of the sales limit was introduced as a criterion for small and medium business starting from July 2015. Now a Russian company can be considered as SME (with all rights to get government support for such kind of business) if it's annual sales do not exceed 120 million Rub. for micro-business and 800 million Rub. for small business and 2 billion Rub. for medium business[63].

A new more positive mood in relations of business toward the government was firstly noticed by the author during the survey which we made on the North West of Russia in 2014. 28% of our respondents represented manufacturing industry and 33% - trading. Despite the traditional complaints about the poor level of performance of the government towards business development

[60] *Улюкаев А., Мау В.* (2015) От экономического кризиса к экономическому росту, или как не дать кризису превратиться в стагнацию // Вопросы экономики. №4 – 2015. P.15.

[61] "Controlling holidays" is a period without special controlling procedures for business from the side of authorities.

[62] Russian Federal Law dated 13 July 2015 № 246-FZ «О внесении изменений в Федеральный закон «О защите прав юридических лиц и индивидуальных предпринимателей при осуществлении государственного контроля (надзора)» и муниципального контроля»

[63] Russian Government Act dated 13 July 2015 № 702, came in force on July 25, 2015.

one entrepreneur has declared that "our state is wise and patient!"[64] He meant that government now finds civilized and understandable ways to explain to legal business even not of a large size in Russia the state expectations (for example, an acceptable level of tax payments) and business reacts positively and ready to cooperate. The professional dialog is ongoing between business and the state.

2. Role of manufacturing in Russian GDP

In the beginning of 2015 industrial enterprises accepted with a great hope the newly introduced industrial policy. The Law[65] gives official determinations for:

- Measures of stimulation of manufacturing;
- Industrial parks;
- Industrial clusters;
- Engineering centres.

Russian Industrial Policy includes a foundation of the state information system of industry and formation the state funds of industry development. Nothing alike has existed in Russia before. Also Government now can launch special investment contracts together with private business. The goals of the industrial policy stated on the Law are the following:

- ✧ to develop hi-tech, competitive industry providing the transition of Russian economy from export of raw materials type to innovative type of growth;
- ✧ to ensure defence of the country and safety of the state;
- ✧ employment of the population and increase of a standard of living of citizens of the Russian Federation.

So from the Law the enterprises can see the state's position in economic development. The state would like to modernize Russian economy and ready to support several industries - especially production of the means of production. And from the side of business in the crises situation import-substitution is the most inspiring thing. So in this case there is no contradiction between the plans of government and enterprises' strategy. The most significant problem is low demand for the new products inside Russia in 2015.

Let's examine the role of industry in GDP formation in Russia during the period 2002-2014. From the table 2 you can see that the share of manufacturing in GDP fluctuated between 12 and 16% which is quite significant.

[64] *Боброва О.С., Ковалева А.С.* (2015) Как делать? Российские предприниматели о бизнесе (по результатам опроса 2014 года): ресурсы, трудности и советы начинающим (HOW TO PROCEED? RUSSIAN ENTREPRENEURS TALK ABOUT BUSINESS (ON THE BASE OF THE RESULTS OF A SURVEY IN 2014) RESOURCES, DIFFICULTIES AND ADVICES TO NEWCOMERS // Российское предпринимательство. Том 16 № 17 за сентябрь 2015.

[65] Russian Federal Law dated 31.12.2014 г. №488-FZ «О промышленной политике в Российской Федерации»

Table 2 - Structure of the produced Gross Domestic Product of Russian Federation (billion Roubles, %)

Codes		**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014** [1)]
	Gross Domestic Product in market prices	10,830.5	13,208.2	17,027.2	21,609.8	26,917.2	33,247.5	41,276.8	38,807.2	46,308.5	55,967.2	62,176.5	66,190.1	71,406.4
	including:													
	Gross value added in basic prices	9,581.3	11,619.8	14,858.8	18,517.7	22,977.3	28,484.5	35,182.7	33,831.3	40,040.1	47,718.9	52,982.9	56,896.1	61,089.4
	including:													
Section A	Agriculture, hunting and forestry	573.8	667.4	773.4	864.2	981.3	1,194.8	1,486.6	1,504.4	1,451.5	1,986.3	1,979.6	2,178.3	2,424.5
Section B	Fishery, fish breeding	29.0	59.4	61.7	55.5	58.1	61.6	62.7	80.6	97.0	98.6	103.1	112.2	124.1
Section C	Mining and quarrying	638.4	769.8	1,411.6	2,064.3	2,509.4	2,865.5	3,284.6	2,885.4	3,842.8	5,110.7	5,826.1	5,893.9	6,306.0
Section D	Manufacturing	1,645.5	1,897.7	2,590.9	3,388.5	4,116.0	5,025.2	6,163.9	5,005.3	5,934.7	7,433.5	7,877.7	8,588.9	9,536.2
	A share of manufacturing in GDP, %	*15.2*	*14.4*	*15.2*	*15.7*	*15.3*	*15.1*	*14.9*	*12.9*	*12.8*	*13.3*	*12.7*	*13.0*	*13.4*
Section E	Electricity, gas and water supply	349.5	414.1	548.3	608.4	727.0	855.9	1,034.0	1,388.7	1,527.1	1,797.7	1,824.2	1,975.6	2,075.4
Section F	Construction	513.5	703.0	847.1	989.9	1,202.0	1,633.9	2,225.3	2,101.5	2,587.8	3,517.5	4,061.7	3,994.3	3,964.5
Section G	Wholesale and retail trade; repair of motor vehicles, motorcycles and	2,192.6	2,572.2	3,012.2	3,610.5	4,673.6	5,745.0	7,137.7	6,060.5	8,021.0	9,115.2	9,693.3	9,887.5	10,575.2

	personal and household goods													
Section H	Hotels and restaurants	88.0	93.9	139.9	167.8	206.7	286.3	358.0	343.7	403.3	466.9	533.3	595.6	636.8
Section I	Transport and communications	978.7	1,244.2	1,642.4	1,897.0	2,247.6	2,750.9	3,258.3	3,249.6	3,662.5	4,114.7	4,699.7	5,098.9	5,333.0
Section J	Financial intermediation	280.3	388.0	474.1	701.2	977.2	1,253.8	1,537.8	1,707.2	1,773.5	1,956.1	2,397.5	2,847.3	3,243.8
Section K	Real estate, renting and business activities	1,019.8	1,246.7	1,408.0	1,828.8	2,287.6	3,102.8	3,959.4	4,220.6	4,901.5	5,509.4	6,240.4	6,860.0	7,459.9
Section L	Public administration and defence; compulsory social security	488.7	651.3	802.5	959.1	1,189.2	1,466.4	1,884.4	2,203.2	2,423.5	2,673.1	3,364.6	3,794.4	3,984.3
Section M	Education	280.0	317.9	400.1	493.2	619.3	769.9	970.7	1,134.2	1,226.0	1,387.8	1,550.3	1,774.1	1,823.0
Section N	Health and social work	321.5	375.9	472.6	564.7	765.5	950.5	1,197.8	1,360.3	1,487.3	1,758.6	1,936.8	2,301.0	2,529.0
Section O	Other community, social and personal service activities	182.0	218.2	273.8	324.7	417.1	522.1	621.5	586.0	700.6	792.6	894.3	994.0	1,073.8
Section P	Household s activity									0.0	0.0	0.1	0.1	0.1
	Taxes on products	1,415.2	1,775.1	2,352.1	3,248.2	4,090.1	4,977.6	6,323.8	5,202.1	6,462.6	8,463.3	9,411.8	9,510.9	10,550.8

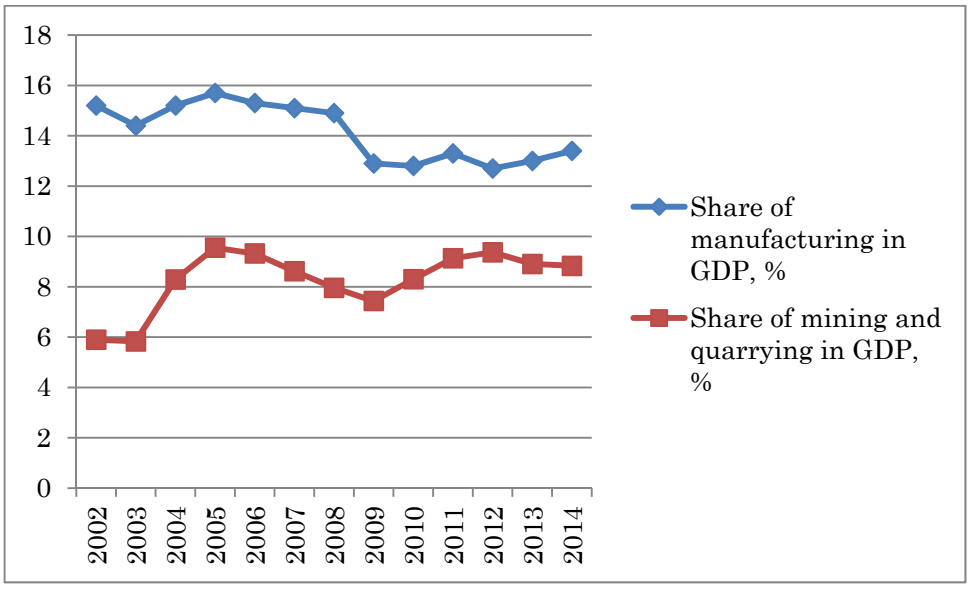
	Subsidies on products	165.9	186.6	183.7	156.1	150.2	214.5	229.7	226.2	194.1	215.0	218.2	216.9	233.8
	Net taxes on products	1,249.2	1,588.5	2,168.4	3,092.1	3,939.9	4,763.0	6,094.2	4,975.9	6,268.5	8,248.3	9,193.6	9,294.0	10,317.0

1) The data for 2014 is presented including Crimea Federal District.

Source: Federal State Statistics Service (http://www.gks.ru, 19 September 2015), a share of manufacturing in GDP (%) is calculated by the author.

From Figure 4 we can see the contribution which manufacturing industry makes to GDP in comparision with mining and quarrying. After 2005 both lines stated to decrease and after the world economic crises of 2008-2011 the manufacturing share did not really returned to the level of 16% where it was earlier. Although the manufacturing contribution in Russian GDP was always higher than the share of extracting. Only in the government revenues taxes which come from export of natural resources are the most significant. In general, the meaning of manufacturing for Russia in terms of GDP and social contribution is definitely higher than extraction of natural resources and in the next decades it will be even more important in view of the forecast of depletion of oil and gas.

Figure 4 - Shares of manufacturing and mining in GDP of Russian Federation in 2002-2014



Source: author's calculations out of Table 2.

It's clear that the contribution of manufacturing industries to the Russian economy is not limited to it's GDP share. In the further research we'll try to consider the sums of taxes which were paid from real sector of the economy to the consolidated Russian budget as a significant material flow from business to the state. But for now it's enough to see that the manufacturing enterprises are more significant than mining and quarrying for Russian economy in terms of GDP.

3. Industry support from Russian government

Partly the contribution of the industry into GDP can be considered as a result of governmental support of the economy. Let's now examine the other side of the relationships between the state and enterprises in Russia: what was done by the government to support industrial sphere starting from 2002? In the Table 3 you can see share of government expenditure in GDP and also two kinds of the expenditure which government make every year – expenditure on economic affairs and expenditure on education. The shares of expenditure of two kinds (economic affairs and education) in total government expenditure are calculated by the author.

Table 3 - Expenditure by function of Russian government (billion Roubles, %)

	2002	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Total expenditures of Russian government on all levels	4681.4	5073	5786.5	6863.8	8530	13429.6	17855.2	18540	19537.1	23519.5	26000	28237.2
Share of government expenditure in GDP, %	43.4	38.2	33.8	31.6	31.7	40.9	42.6	46.9	41.8	41.8	41.4	42.3
Expenditure on economic affairs	587.4	678.8	750.6	760.2	576.5	No data	1660.9	1838.2	1812.9	2322.7	2350.9	2665.7
Share of expenditure on economic affairs in total government expenditure, %	*12.55*	*13.38*	*12.97*	*11.08*	*6.76*	No data	*9.30*	*9.91*	*9.28*	*9.88*	*9.04*	*9.44*
Expenditure on education	408.5	481.7	588.2	770.2	1036.4	No data	1663	1858.9	1909.18	2265.2	2471.2	2824.3
Share of expenditure on education in total government expenditure, %	*8.73*	*9.50*	*10.17*	*11.22*	*12.15*	No data	*9.31*	*10.03*	*9.77*	*9.63*	*9.50*	*10.00*

Source: International Monetary Fund e-library (http://data.imf.org/)

In general, we may see that the role of government in Russian economy in terms of expenditure from GDP is not stable and fluctuate in 21st century between 31.6% and 46.9% of GDP. The peak of government involvement in the economy was noticed in the crises 2009 year when the government supported several enterprises and industries to get well after the crises. After that peak even the absolute sum of government economic expenditure has dropped for the only time during the period observed. So, in 2014-2016 we may expect again a rise of the state involvement due to the crises situation in Russia.

From the table 3 we can see that starting from 2005, excluding 2011 (and maybe 2007 for which only general sum of the government expenditure is available on IMF e-library), the expenses for the education in Russia even exceed the expenses on economic affairs. So the efforts by the government to support industry are rising in crises times in Russia in our opinion, but not enough in other periods. If we compare Chinese government efforts to modernise their economy with Russian ones we may notice in 2012 that Chinese government has spent 8.2% of GDP on economic affairs and Russian 4% look not very impressive – this level is closer to a Japanese one (4.4% in 2013). Not only the size but also effectiveness of the government expenses on economic affairs is questionable, although in 2008-2011 the world crises came across Russian economy not like a hurricane but as a regular storm. The next crises of 2014-2016 will not be such an easy one for the industry to come over.

The modernization is essential for the socio-economic development of Russia in conditions of changes of global oil & gas markets and under the economic sanctions of many countries against Russia and the Russian contra-sanctions – the moratorium for import of a range of products.

In crises times Russian government supports public and private corporations due to their social importance. From the Figure 5 you can see the sums in Roubles spent in forms of subsidies for the enterprises and also before 2005 – general government expenditure for several industries including manufacturing. Starting from 2005 general government expenditure on mining, manufacturing and construction in Russia became equal to zero and obviously took another form – subsidies, for example.

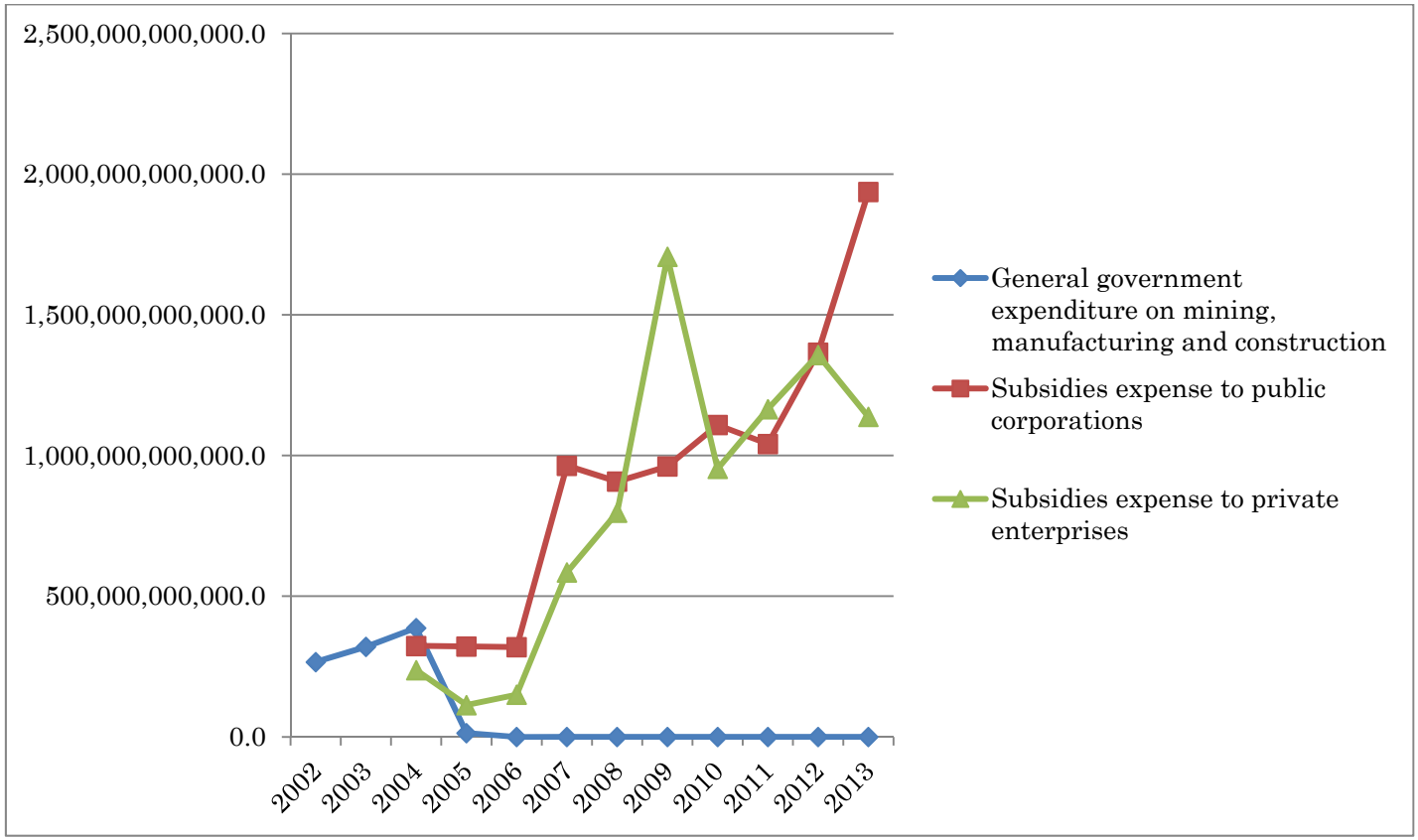
From IMF manual we know that government expenditure on mining, manufacturing and construction includes among others:

- "Administration of manufacturing affairs and services; development, expansion, or improvement of manufacturing; supervision and regulation of the establishment and operation of manufacturing plants; liaison with manufacturers' associations and other organizations interested in manufacturing affairs and services;
- Production and dissemination of general information, technical documentation, and statistics on manufacturing activities and manufactured products;
- Grants, loans, or subsidies to support manufacturing enterprises"[66].

Here we just draw the attention of readers to the fact that since 2005 the attitude of the state support for the industry in Russia has changed. Another research is needed to explain why it happened and what consequences may be derived from this situation.

[66] Government Finance Statistic Manual 2014. – Washington, D.C.: International Monetary Fund, 2014. ISBN: 978-1-49834-376-3 (paper) P.154.

Figure 5 - Russian government expenditure on manufacturing support and subsidies by the government provided to public corporations and private enterprises in Roubles



Source: International Monetary Fund e-library (http://data.imf.org/) On December 31, 2013 the official Russian Central Bank rate of exchange was: 100 JPY ＝31.0568 Roubles.

4. International comparison

An international comparative analysis shows that Russian government devotes to economic affairs less than Japan or China in overall government expenditure. The state support of manufacturing is only a part of general economic affairs of the state and unfortunately in Russia is still not enough in total government expenditure. In the condition of economic crises the state is expected to do more for the manufacturing industry. As we have seen on Figure 5, after 2005 the government expenditure on manufacturing became equal to zero which probably means that from that time the state support of manufacturing took another form – for instance, subsidies to enterprises. This part of government expenditure needs additional research in our opinion.

Here we compare a share of consolidated budget which is spent for economic affairs in different countries including Russia:

Table 4 - Structure of government expenditure in several countries including Russia and Japan, % of GDP

	Russian Federation	**UK**	**Germany**	**South Korea**	**China (mainland)**	**Japan**
year	2013	2013	2013	2010	2012	2013
Expenditure on general public services	9.5	5.7	6.4	3.7	2.8	4.5
Expenditure on defence	2.5	2.3	1.1	2.4	1.3	0.9
Expenditure on public order & safety	3.0	2.2	1.6	0.9	1.3	1.3
Expenditure on economic affairs	**4.0**	**3.1**	**3.4**	**5.4**	**8.2**	**4.4**
Expenditure on environment protection	0.1	0.8	0.6	0.4	0.6	1.2
Expenditure on housing & community amenities	1.4	0.7	0.4	1.6	1.9	0.8
Expenditure on health	3.4	7.6	7.2	0.4	0.9	7.5
Expenditure on recreation, culture, & religion	1.2	0.8	0.8	0.7	0.5	0.4
Expenditure on education	4.2	5.5	4.4	3.7	4.2	3.6
Expenditure on social protection	13.0	16.9	19.4	5.4	7.2	18.1

Source: International Monetary Fund e-library (http://data.imf.org/)

The years selected for comparison depend on availability of the data in IMF e-library – I tried to take the freshest data available.

South Korean and Chinese government spend very significant shares of GDP for economic affairs. Russia spends on its economy more than UK or Germany (in terms of GDP share), but less than Asian countries. In the next crises years – 2014, 2015 and 2016 – I think, we will see further growth of Russian GDP share spent on economic affairs as the government

involvement in the economy will only grow. The state will invest funds in industry to support business in the crises and we will see the results. Also the assimilation of the Crimea economy after the reunion with this region will require a lot of government efforts in different spheres including the support of the enterprises. And interesting thing is that out of the selected countries Russia has the highest level of expenditure on recreation, culture, & religion. The cultural heritage which Russia keeps needs significant financial endorsement. And education also consumes significant state funding.

The expectations of Russian enterprises towards the government now include requests for support of real sector and demand for more freedom for small business[67].

From the side of the state the main expectation is that business will decrease the outflow of capitals from Russia and will not drop the taxes payments. In case of military industry the state is interested in qualitative performance of defence orders. Under the conditions of economic sanctions that became an especially challenging task. Responsible business behaviour towards employment especially in small and mono-towns is also what the state as a stakeholder considers being vital. These are the main interests which the state as a stakeholder promotes in the dialog with business including manufacturing enterprises.

5. Stakeholder approach to state-business relations

Russian specificity of multi-stakeholder approach can be characterised by the following points:

- "The key stakeholders for Russian companies are still the government, employees and the local community; involving new stakeholders in the interaction is proceeding slowly"[68].
- Dialogue between the business community and the government is on-going; sometimes corporate social programs are forced by local authorities, especially in so called company-towns.
- The conflicts between companies and the government are possible due to misunderstanding of the expectations of the both sides.
- The problem is to engage wider circles of stakeholders into productive discussion with business and to increase effectiveness of stakeholder-management.

Implying the stakeholder approach to state-business relations may be useful from two points of view: firstly, it allows to improve the performance of the enterprises in terms of better relations with the state which lead to decreasing uncertainty of economic environment and a better chance to be involved in the state-lead mega-projects[69]; and secondly, stakeholder attitude to the state will contribute to sustainability of every enterprise involved and Russian economy as a whole.

Those entrepreneurs who understand importance of gradual increasing of the tax payments find support of different kind from the state. The level of education of entrepreneurs plays a key role in this understanding. No claim of the governmental corruption was noticed during our survey of SME entrepreneurs in 2014. This finding is confirmed by earlier studies

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[67] *Боброва О.С., Ковалева А.С.* (2015) Как делать? Российские предприниматели о бизнесе (по результатам опроса 2014 года): ресурсы, трудности и советы начинающим (HOW TO PROCEED? RUSSIAN ENTREPRENEURS TALK ABOUT BUSINESS (ON THE BASE OF THE RESULTS OF A SURVEY IN 2014) RESOURCES, DIFFICULTIES AND ADVICES TO NEWCOMERS // Российское предпринимательство. Том 16 № 17 за сентябрь 2015.

[68] *Blagov Yu., Savchenko A.* (2008) Report on Social Investments in Russia 2008. Moscow: Russian Association of Managers.

[69] *Боброва О.С., Цыбуков С.И., Бобров И.А.* Основы бизнеса: учебник и практикум для академического бакалавриата (Business Essentials: textbook and practicum for academic bachelors) — М. : Издательство Юрайт, 2016. Серия : Бакалавр. Академический курс. ISBN 978-5-9916-6144-7

in April-May 2014 when 36% of enterprises' managers said that during last 2-3 year they did not feel any corruption pressure from civil servants[70]. Therefore if an entrepreneur knows and follows the laws, pays taxes out of business processes which are arranged in a way to make profit in the present conditions of the tax burden, no conflicts with the state in Russia usually happen.

During our survey among Russian SME we have revealed that only 7% of the answers of the entrepreneurs to the question about CSR mentioned the state as a stakeholder of the business[71]. Naturally Russian entrepreneurs care more about their customers and employees, than about the state, although this trend is not exactly the same as in Western Europe: "Internal stakeholders and the local community usually receive more attention from SMEs" writes Linh Chi Vo[72]. In every country if we speak about small business, "due to the particular nature of SMEs, employees are important stakeholders"[73]. But small companies are also looking outside of their own firm – as our survey has shown, at least they care about the customers, as external stakeholder, but also Russian entrepreneurs take into account the needs of Russian society at large. European SMEs are more engaged with local community than Russian business yet. Although in our research we noticed local community as a more popular stakeholder than the state. In countries where civil society is not strong enough due to objective reasons, government becomes the strongest representative of the society at large. Therefore in Russia there is still a process of recognizing of importance of civil society and constructing a dialog between the state and other representatives of the society – such a NGOs (including religious organizations), local communities' activists, etc.

As an Austrian Economic school states, in general the state elsewhere is initially established by force[74], so naturally business with its adherence to freedom has many reasons to contradict with the state requirements. In Russia the situation is elaborated by a social trauma of socialism epoch when the state has imposed a certain view on business that it could only exist in public companies and had strictly controlled form. The private business was legally forbidden until 1989.

D. Kuvalin explains that if in 1990s the contacts between enterprises and governmental structures were minimized, in 2000-2007 the state control has strengthened and managers had to apply to the state on numerous occasions. Business legislation became more and more sophisticated and inspections from tax service and other authorities turned to be everyday experience of business. Under that circumstances enterprises had to become more civilised and transparent to the state[75]. The managers understood that if tax payments are not rising from year to year more tax inspections will come and more problems they will bring. Therefore they tried to understand the expectations to their business and act accordingly.

At the same time we should not forget that massive business ethics violations which

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[70] *Кувалин Д.Б., Моисеев А.К.* (2014) Российские предприятия весной 2014г.: деятельность в условиях замедления экономического роста. Electronic publication: http://www.ecfor.ru/index.php?pid=epub Accessed on October 14, 2014.

[71] *Боброва О.С., Ковалева А.С.* (2015) Как делать? Российские предприниматели о бизнесе (по результатам опроса 2014 года): счастье, ответственность и инновационная деятельность (HOW TO PROCEED? RUSSIAN ENTREPRENEURS TALK ABOUT BUSINESS (ON THE BASE OF THE RESULTS OF A SURVEY IN 2014) happiness, responsibility and innovation activity // Российское предпринимательство. Том 16 № 16 за сентябрь 2015. pp. 2599-2618.

[72] *Linh Chi Vo.* (2011) Corporate social responsibility and SMEs: a literature review and agenda for future research // Problems and Perspectives in Management, Volume 9, Issue 4, 2011, pp. 89-97., p. 91.

[73] *Linh Chi Vo.* (2011) Corporate social responsibility and SMEs: a literature review and agenda for future research // Problems and Perspectives in Management, Volume 9, Issue 4, 2011, pp. 89-97., p. 95.

[74] *Holcombe R. G.* (2004) Government: Unnecessary but Inevitable // The Independent Review, Vol. 8, No. 3, 2004. pp. 325-342.

[75] *Кувалин Д.Б.* (2009) Экономическая политика и поведение предприятий: механизмы взаимного влияния. М.: МаксПресс, 2009. С.220.

were observed in 1990s could not disappear immediately. Managers were spoiled by weak control from the state and it was a real challenge for them to change attitude to the law after 2000 – "they get used to a twisted economic logic"[76].

But in 2000s the level of antagonism between enterprises and the state has decreased and managers realised that they have to increase tax payments. "As a consequence, many enterprises voluntarily enough reduced the scale of activities connected to financial crime and tried to employ only legal forms of tax optimization"[77].

In my opinion, the state in Russia has played all leading roles in public life for such a long time that people got used to invoke authorities in all problems. Enterprises demand support and criticise the government, they would like to be independent but they have mingled feelings toward the state. We in Russia just need more time to revitalize relations between the state and business – and industrial enterprises, in particular.

In Russia mega-projects led by public state owned corporations can be considered as a way of support of private business of different size and may be successful to overcome the stagnation in the economy.

6. Russian SME's attitude toward the state

Stakeholder approach finds its fruitful application in analysing CSR of small and medium business: "literature on SMEs depicts stakeholder theory as a viable explanatory theory for SME CSR activity"[78]. In Russian big business the state is traditionally among the key stakeholders: see social reports and social codes of RZhD, Rosneft, Lukoil, Gazprom, Sberbank, etc. As was revealed in our survey, SME in Russia are socially responsible without reporting their social activities to society[79]. In our opinion engagement with the stakeholders is effective when based not only on the interests of them and those of a firm but on the values of both sides. Screening of values and cooperation for the shared value promotion is important part of the stakeholder management.

In the survey of SME in 6 Russian regions we had a question about interactions with the state. It was an opened question and the responses were categorised into 12 groups as you can see in table 5.

Table 5 – Responses of Russian entrepreneurs to a question "Please describe in short your interactions with the state (apart from paying taxes) in 2014, % of the total number of responses collected

№	Responses category	% out of the total
1	No relations	15
2	Participation in public tenders	13
3	Cooperation is needed due to the nature of business	12

[76] *Кувалин Д.Б.* (2009) Экономическая политика и поведение предприятий: механизмы взаимного влияния. М.: МаксПресс, 2009. С. 236.
[77] *Кувалин Д.Б.* (2009) Экономическая политика и поведение предприятий: механизмы взаимного влияния. М.: МаксПресс, 2009. С. 240.
[78] *Linh Chi Vo.* (2011) Corporate social responsibility and SMEs: a literature review and agenda for future research // Problems and Perspectives in Management, Volume 9, Issue 4, 2011, pp. 89-97., p. 91.
[79] *Боброва О.С., Ковалева А.С.* (2015) Как делать? Российские предприниматели о бизнесе (по результатам опроса 2014 года): счастье, ответственность и инновационная деятельность (HOW TO PROCEED? RUSSIAN ENTREPRENEURS TALK ABOUT BUSINESS (ON THE BASE OF THE RESULTS OF A SURVEY IN 2014) happiness, responsibility and innovation activity // Российское предпринимательство. Том 16 № 16 за сентябрь 2015. pp. 2599-2618.

4	Negative evaluation of the government role	12
5	Government financial support	8
6	Positive evaluation of the government role	8
7	Participation in the public organizations	8
8	Fulfilling public enterprises' orders	4
9	The state-business partnership	4
10	Credits	4
11	Constant control from the government side	4
12	Participating in the events organized by government	2

Cooperation with the state is able to contribute to sustainability of development not only of big business but also small companies – they can get public orders to sell their goods and services to the state, they can also engage in state-business partnerships, get financial support from the state, get lots of useful information from authorities, etc.

7. Japanese experience for Russia

After the Second World War Japan came through a restoration period when the government ruled the economy in a tough way with a strong influence from USA. Several groups of companies who led the economy before the War as *dzaibatsu* were reformatted and after the War seven *keiretsu* (partly routed in *dzaibatsu*) - Mitsubishi, Mitsui, Sumitomo, Sanwa, Fuyo, Dai-Ichi and Kangyo – became drivers of the economy. Foreign investments were attracted, and small business traditions were never suffering from a break of succession.

Business associations Nippon Keidanren and Keizai Doyukai provided discussion opportunities for the business community and had (and have until now) the tools to influence governmental decisions. Active involvement of the country in international trade has open new markets for Japanese goods.

Development of the high-tech manufacturing industry using advantage of minimum military expanses allowed Japan to rise dramatically the productivity of the economy, but also put the country into the close dependence to the world markets – of energy resources and of investment goods and financial instruments.

Although the modernization in Russia and in Japan were going on the similar path before 1950s[80], now the economic systems of both countries are challenged by different problems. All the more so, the neighbouring location of the two in the most dynamically developing region in the world – Asia – provides preconditions to learn from each other.

Japanese companies of different size consider the state as not the most important stakeholder. The majority of the businesses just pay taxes and leave the question of their distribution on the government responsibility. Trust is widely shared between all economic actors and maybe it is the most precious thing which Russian business and government can learn from Japan.

The main conclusions:

1) Governmental support which Russian industry was getting between 2002 and 2013 seems not to be effective and enough after 2005. A contribution of manufacturing into Russian GDP is more significant than mining and extracting but almost not rising after the world economic crisis of 2008-2011.

[80] The Modernization of Japan and Russia. A Comparative Study / C. E. Black, M. B. Jansen, H. S. Levine [at al.]. New York ; London : The Free Press, 1975.

2) Year 2005 seems to be critical in changing the government attitude to the industry.
3) Stakeholder approach to state-business relations is perspective for manufacturing industry.
4) The effectiveness of the stakeholder approach may be seen from two sides: better performance of the enterprise and sustainability of Russian economy as a whole.
5) Japanese experience in state-business relations is useful for Russia.

As it is told in my university, «the economy always wins! » And for enterprises, regions and states this victory may turn to be win-win situation. For instance, D. Kuvalin after longitude studies of enterprise' behaviour in Russia puts it this way: "The experience of the USSR and Russia has demonstrated that economy eventually always appear to be stronger than economic policy"[81]. That does not mean that all problems can be solved with money – the one who prefers monetary solution will always be able to find another agent who will pay more and even for that agent the one will not be a trustful partner. The economy finally is something that is agreed between people regarding the way life in society under the influence of the science, education, historical experience, mentality and external and internal circumstances. The economy is multifaceted – it is not just an instrument of rising prosperity of people and not ideology-driven tool of compulsion to a certain way of life. The economy in my opinion is a display of the unique ability of human being society for united creativity and arrangement of the common home – an enterprise, a region, a country.

In the state-industry relations in Russia finally the fruitless fight will stop and the economy will win as always. It's time for business to be weaned from the state. Government needs prospering enterprises and business needs the strong state and society. Through the constant dialog between entrepreneurs from one side and the state structures from the other side those stakeholders of each other will learn to listen and act together because the mutual understanding is economically efficient. The role of academia I see in clarification the interests of the both sides in this dialog, objectivation of the models of interaction, attracting international experience and rising resources – human and organisational first of all – to promote the recovery of the business-state relations in Russia.

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[81] *Кувалин Д.Б.* Экономическая политика и поведение предприятий: механизмы взаимного влияния. М.: МаксПресс, 2009. С. 266.

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Russian Government Act dated 05 February 2015 N 102 «Об установлении ограничения допуска отдельных видов медицинских изделий, происходящих из иностранных государств, для целей осуществления закупок для обеспечения государственных и муниципальных нужд»
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Empirical Studies Expanding D. Kahneman views on Intuition (Russian Entrepreneurial Experience)

Andrey Alekseev, Natalia Fomina[82]
St. Petersburg State University of Economics, Russian Federation

Abstract

In this article, the authors propose economic projection of the views of Daniel Kahneman on intuition. The authors believe intuition to act as an operative category in entrepreneurship. The results of given statistical experiment prove viability of the phenomenon of intuition when making investment decisions. Two independent mechanisms for investment decisions are being defined - the «rational» and the «intuitive» ones. The research leads to conclusion that entrepreneurs' intuitive decisions possess a relatively high level of efficiency.

Keywords: management; entrepreneur; investment; intuition; decision-making under uncertainty; risks.

JEL classification numbers: M13, M20, G23

Introduction

"The only real valuable thing is intuition."
Albert Einstein

The idea of this article was prompted by an interesting phenomenon under our observation. In practical work, we often see a situation where entrepreneurs (investors) make decisions that are contrary to the formal business plans. They reject the projects prepared by managers on the basis on academically verified analysis of the market, of the potential of the enterprise, of the business environment. Investors set up decisions contrary to "objective" market trends, decisions based only on intuition, and ... they turn out to be right. We see this as an objective business tool and call it **intuition of an entrepreneur**. We would like to discuss in this publication some **quantitative experimental** observations confirming the instrumental consistency of intuition.

Intuition in economics

The question of intuition in economics has been remaining a «soft» one. On the one hand, intuition is not denied as an objective reality; on the other hand, it is not projected into an operative category by any theoretical discipline of management. There are no academic rules on how to apply it. Most economists debate about intuition in the manner of "the decision-making under uncertainty", then go to the theory of risks and run into math. It is difficult to agree with this position: decision-making under uncertainty and the use of intuition are two different questions. Intuition of an entrepreneur is an independent question that does not fit into the traditional methodological framework of economic science.

The concept of intuition in the most general terms was taken in a vision of philosopher Valentin Asmus (1965): intuition is "a direct judgement of the truth, that is a judgement of the objective links between things not based on proof." Question about the nature of intuition is

[82] Andrey Alekseev, PhD, Dr. Sci. (Econ.), Professor at St. Petersburg State University of Economics. E-mail: idc@unecon.ru Natalia Fomina, PhD, Dr. Sci. (Econ.), Associate Professor at St. Petersburg State University of Economics. E-mail: natalia.fomina@mail.ru

currently in the focus of research by psychologists, neuroscientists, mystics. Accepting the fact of the phenomenon, academics have different views on its genesis. For instance, psychologist Gary Klein (2009) sees its manifestation through "unconscious identity", and a group of Canadian psychologists (Bowers K. S., Regher G., Balthazard C. Parker K. (1990)) who studied the nature of the discoveries believe that intuition is "the quintessence of experience." A reputable scholar Alasdair MacIntyre (1984) considers intuition against the background of systematic unpredictability in human affairs through the likely map of the subject's behavior, and the achievement of positive results is identifiable to fortune. And, of course, explanation of academician Vladimir Vernadsky (1945) in the framework of the phenomenon of "noosphere" also quite logically lies in the field of hypotheses about the nature of intuition. Some researchers omit the question the nature of intuition, taking it as the operating category, and immediately go on to describe the mechanisms of decision-making based on it: social psychologists Ap Dijksterhuis (2006), Gerd Gigerenzer (1987), neuroscientist and neuroscientist Gerhard Roth (1997), John Lehrer (2009), psychologist John Kehoe (2008), philosopher Henri Bergson (2008), management expert Henry Mintzberg (1989), expert on business management practices Robert Waterman (1989). In an economic context, there is also an authoritative view of business consultant and writer Kjell A. Nordström (2002) on implementing knowledge. In general, there is an objective impression, that despite the lack of proper comprehension of the nature and boundaries of intuition as a category, the scientists insist on its existence and advocate for its use. As Waterman states, intuition is not as mystical as it seems. It allows us to play years of experience without conscious deliberation. Trust your sixth sense. Use your intuition without embarrassment[83].

At the same time, it can be found that the problem of decision-making is discussed as a balance of rational and irrational by most of the sociologists, psychologists, neurophysiologists, whereas the practical results of the studies resume to cognitive science. Even Kahneman, who was awarded in 2002 Nobel Memorial Prize in Economics for his work in prospect theory, is a professor of psychology at Princeton University. He casts doubt on the postulate of rational behavior of economic entities and claims on individual decisions, which are unbalanced in risk and value in their nature. However, this estimate is quite consistent against the background of institutional views dominating in economic science. But even the initial reading of his works (in particular, "Attention and effort", 1973) reveals experiments[84], which can be interpreted as "doubt" in the fundamental economic categories of "value", "utility", "rationality". The arguments on the role of intuition in management and economics in the debate are these taken from psychological and sociological tests. However, having reviewed a number of publications and studies, we have not been able to detect **the economic experiments** aimed at the consistency of the interpretation of the application of intuition in business decisions. It is in this direction that we propose to develop academic positions of modern science - the formation of quantitative statistical experiments that can prove the consistency of intuition as a category of operating businesses.

Subject of intuition

A starting point of the debate about intuition in economic behavior should be identification of its subject. Unfortunately, most scientists do not focus on this issue, and the psychologist and sociologists probably do not assume any principal differences between economic subjects. Hence calls for the use of intuition are unaddressed.

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[83] Waterman, Robert. (1989) *The Renewal Factor: How the Best Get and Keep the Competitive Edge*. Transworld Publishers Ltd, Bantam Books.

[84] Including well-known description of the experiment about the moral acceptability of the death choice prospects of different population groups of people from a dangerous virus.

We believe to be academically correct and principal to distinguish between two groups of economic actors at the micro level (enterprise, organization):

• **managers** (employees);

• **entrepreneurs** (investors, business owners).

Most scientists either do not make difference between these subjects (their positions and functions are being mixed), or directly address intuition to the competence of managers. We argue that intuition as operational tool belongs to **entrepreneurs** only. Let us explain this position.

Managers are employees, motivated with salary. The object of their close attention is the amount of their payment. If this payment is maintained even though financial performance of the investment project is negative, the manager is still in the comfort zone. For example, the results of the study "Intuition in decision-making," conducted by company Reflexivity.ru[85], led to the conclusion that managers of investment assets of banks and traders in the stock market reject intuition as a tool for decision-making. The survey results and the conclusions drawn by Reflexivity.ru are objective, they are consistent with our position and do not deny intuition as a tool. The sample survey was made on managers who were not entitled to documentary unjustified risk. Such managers do not depend on results of investments, they do need a professionally executed process of asset allocation, approved by the owner. If their actions, which are correct in terms of the job description and tutorials, lead to a negative result, they are still "right." This position is invulnerable from the viewpoint of the role and functions of a professional manager. The manager does not bear the risks and therefore has no right to intuitive solutions. A similar opinion was expressed by Samvel Avetisyan (2002)[86], director of marketing for Tinkoff company. We can conclude from the interview that the primary point is the intuitive insight of the businessman Oleg Tinkoff, and then managers are supposed to provide rationale for that.

For the manifestation of intuition, one needs to be vitally concerned in the result, to experience deep emotional feelings for equity, to be willing to risk with own funds, and this is not inherent to an employee by definition. In this regard, entrepreneur is opposed to manager. The entrepreneur, as the owner of the capital, the investor, bears the risks of ownership that provides emotional interest and experience, depth of immersion in the situation. Indeed, it is an **emotional concern** in the effectiveness of placing own funds that gives the impetus for the manifestation of intuition. A manager can be taught in terms of formal educational process and then integrated into the process chain of the organization. Whereas being an entrepreneur is an art, a talent, a natural propensity to take risks. It was described in the early 20th century by Joseph Schumpeter (1910), who outlined the entrepreneur as a person with unique, given him by nature, personality traits. This viewpoint has not been contested for a century: in the economic theory, "entrepreneurship" (implying the identity, or personality) is formulated as a "factor of production", "enterprise resource". For instance, Chester Barnard (1968) sees the economic inefficiency of "formal" organizations, deprived of "intuitive entrepreneur." However, there are other interpretations in the literature, where entrepreneur is treated as an "active agent of influence" on the market, and not an "intuitive party" who adapts to the trend. That is, the entrepreneur does not predicts the fluctuations of the external environment only, rather affects it consciously by investment decisions. But we are inclined to take this position only in a situation where investment volumes in possession of a businessman are large enough to change the economic structure of an industry. In all other cases, we consider the behavior of entrepreneurs (investors) as "fit" to the created market, aiming to adjust to the prospective trend.

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[85] Source http://www.reflexivity.ru

[86] Interview with Samvel Avetysyan «*Luboi predprinimatel – tvoretz*» (Any entrepreneur is a creator). Magazine Boss, №10, 2002.

And intuition in this case can be determined as the instrument of long-term vision, as a sense of trends in the industry and the market.

Thus, we believe it correct to explain manifestation of intuition in economics by activities of entrepreneurs, the owners only, and objectivity of consistency of intuitive decisions can be proved by effectiveness of investment decision in relation to own equity.

There is currently no actual need to prove the thesis of the instrumental value of intuition - the fact of awarding Kahneman the Nobel Prize is a sign of its academic consistency. We would like to see the **role of intuition in business**, when it is expressed in the microeconomic results, that is, in specific projects. Demonstration of intuition in the economic context will allow to substantiate the thesis:

> The entrepreneur has the right to make intuitive investment decision even against the logical corollary of the rational analysis of market information, despite managers' opinions based on formal marketing and economic research of the organization.

Experiments

In this context, we conducted a statistical experiment aimed at evaluating the effectiveness of investment decisions of entrepreneurs at various level of transparency of the market prospects. We have selected **207 investment decisions of entrepreneurs**, each of them we could personally observe and quantitatively formalize in the period of 1993-2012. The average level of investment decisions was 2.92 million USD at an average project duration of 2.7 years. Each investment project was viewed through two economic evaluations.

1. The effectiveness of investment decision ("E" expressed in portions in Fig. 1) was considered as a degree of deviation of the net discounted value from the estimated value of the project in the period the asset allocation.
    a. The value of E = 1.0 (in total value) means that the net discounted income equals the planned one, a value above 1,0 in the positive zone means exceeded expectations for return of the project
    b. 0 - the value of income is below 100% of the planned one.
    c. -1.0 means less than planned by 200%.
2. The level of information availabity of investment decision («I» expressed in portions in Fig. 1) was considered as an expert estimation of information availability in the project.
    a. The value over 1.0 was taken for a situation promising full transparency of the market situation to the investor, such as a preliminary agreement or a signed contract with a potential buyer.
    b. The value 0.75 characterizes "entering the old market with the old product" while maintaining or expanding production volume.
    c. The value 0.5 – entering the old market with a new, modernized (innovative) product. Accordingly, 0.25 means entering the new market with a new (innovative) product.
    d. And, the value of less than 0.2 indicates the uncertain, non-transparent position of the product and the market.

Thus, each investment decision of entrepreneurs can be considered in the plane of cost-effectiveness in an appropriate level of information transparency of the market prospects of the project. The rational interpretation of the distribution of the statistical indicators of the experiment is expected as a linear: the higher the level of awareness of (I) is, the higher the level of efficiency of investment decisions (E) is expected.

And this is exactly the obvious type of formulation that is present in all textbooks on business and investment planning, the same being the basis for principles of due diligence.

Contrasting rationality to intuition, we would have to observe the following picture of the statistical distribution: concentration of projects with low information availability (I <0.5) in the zone of negative performance evaluations (E <1) and those with high information availability in the positive zone. But if we accept the existence of intuition as a category of operating economics, we must see that there are effective (E≥1) investment projects with low (I<0.5) information availability.

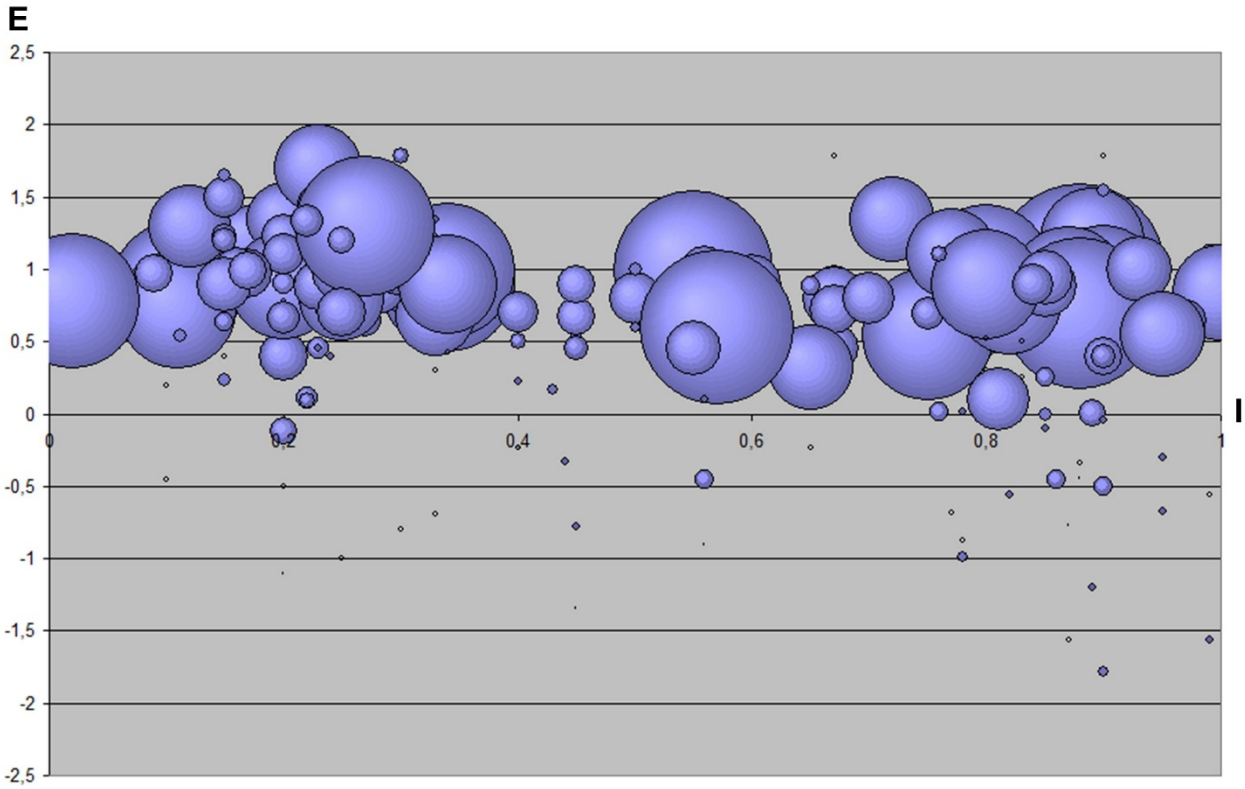

Fig. 1 - Distribution of investment effects (E, portions) at different levels of information availability (I, portions) and the amount of the investment project (W, relative volume) - the size of the point.

The statistical distribution of the investment effects (E) of the 207 projects surveyed in the experiment, all of them under different levels of information availability (I), is shown in Fig. 1. This distribution does not meet the doctrine of rationality: it is enough just to cast a glance to see equal presence of effective projects in the area of high and low information availability projects. Clearly visible are projects, the effectiveness of which was achieved **by intuition of the entrepreneur**, and there are no other explanations for solvency of investment decision at such a low level of understanding of the prospects and such high risks of entering the new markets with innovative products.

To enter the zone of more rigorous statistical estimates within the research data set we conducted analysis using *k*-means clustering method, Fig. 2. Clusters are calculated taking into account the weight of each project, which was taken as absolute (given by 2013) investment volume value (W, Fig. 1). The obtained result is completely objective vision of two clusters and their coordinates (Fig. 2):

• Coordinates of the core of the first cluster: I1 = 0.801; E1 = 0,775.

• Coordinates of the core of the second cluster: I2 = 0.258; E2 = 0.978.

We can clearly can see two clusters – one with low (1) and another with high (2) information availability of investment decision. Moreover, a cluster with low information availability decisions (which we have every reason to call "intuitive") lies in the relatively high

level of efficiency of investments (0.978), unlike the cluster of high information availability (0.775), the "rational" one. That is, the average value of the net discounted income of projects in an intuitive cluster is 0,98 of the planned, and a rational cluster has value of 0,78.

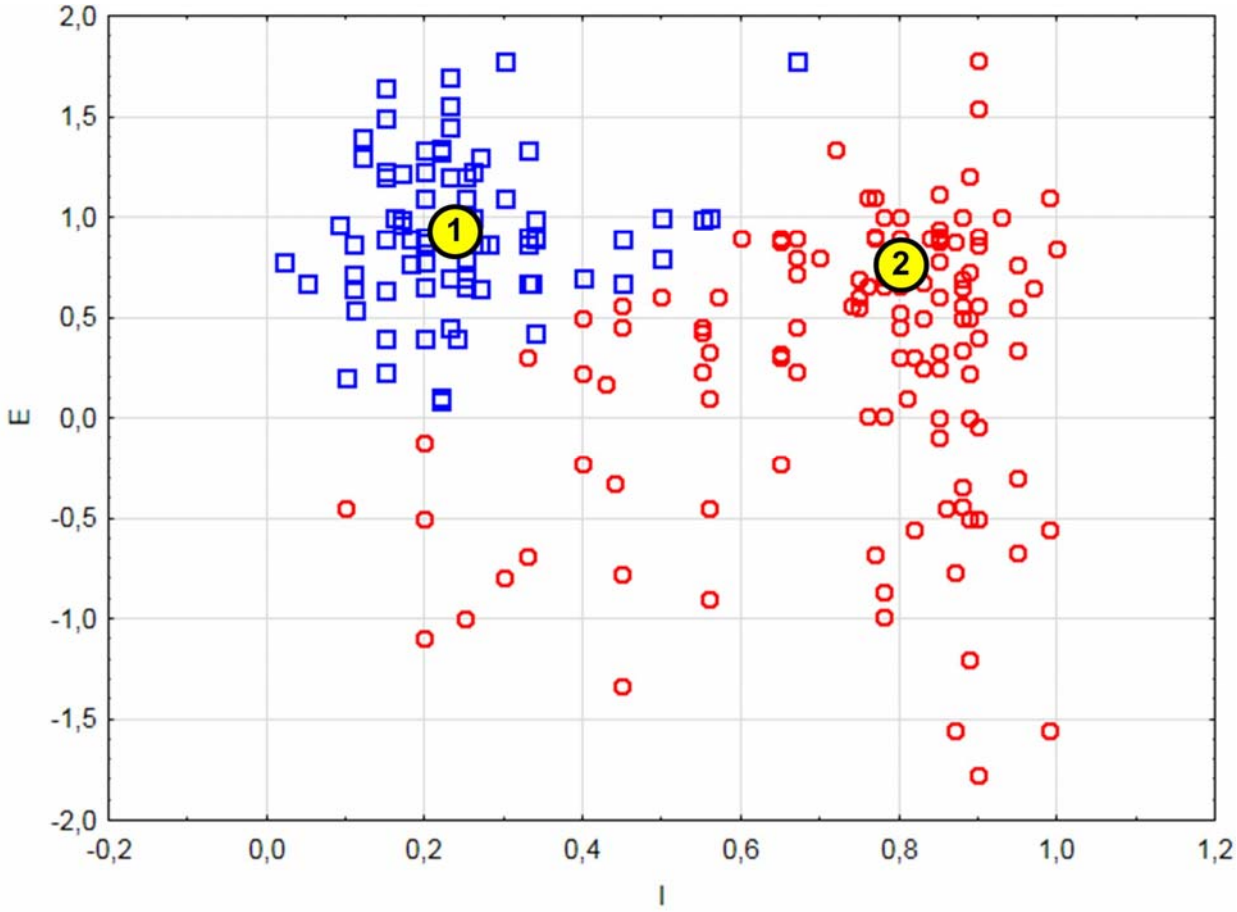

Fig. 2 - Clusters of the "intuitive" (1) and "rational" (2) decisions by entrepreneurs according to monitoring of the investment effects (E) at various levels of information availability outlook (I).

Conclusion

Using the analysis of the cluster distributions, we can come to the following general conclusions:

1. Variability of investment outcomes for "rational" decisions (Cluster 2) is very high (from -1.75 to 1.75). Field of Cluster 2 is much wider than that of the first one, an "intuitive." This speaks about very wide variability, uncertainty, risk that accompany the rational approach to investment decision-making at the level of managers.
2. The core of the Cluster 2 (E = 0.77) is lower as to the scale efficacy compared with the cluster of intuitive decisions (E = 0.97). That means, we can make a conclusion about relatively large prognostic potential of intuitive decisions of an entrepreneur compared to a rational approach based on information availability to the estimated project.
3. Decisions of the lowest economic impact are located in the zone of the half-way, ambiguous information (I = 0.35-0.65). That is, a partial awareness of the entrepreneur is more likely a "noise" that knocks his prognostic focus.

The vision of two clusters fits quite well position of Kahneman (2000) on two decision-making mechanisms. “Psychologists distinguish between a "System 1" and a "System 2," which control

our actions. System 1 represents what we may call intuition. It tirelessly provides us with quick impressions, intentions and feelings. System 2, on the other hand, represents reason, self-control and intelligence." Presented statistical experiment allows to supplement and develop the vision of Kahneman into direction of instrumental nature of **entrepreneur's intuition**. The experimental results add another word in the feasibility study of intuition as an economic category. The present study allows the authors to formulate a categorical definition from economic position:

Intuition of an entrepreneur is evaluation of prospects of investing capital built on the subconscious feelings and estimates of its owner.

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Problem of efficiency assessment of projects in the conditions of the knowledge-based economy

Elena A. Tkachenko, Vadim Klimov, Vladislav Klimov, Vyacheslav Nabizadi[87]

St. Petersburg State University of Economics, Russian Federation

Abstract

The authors consider approaches to evaluate innovation projects efficiency in the conditions of the modern knowledge economy. A modified model of cost estimation of real options using fuzzy set tool is presented in the paper. Also an example of two-period polynomial tree for investment decisions is included. The fuzzy sets instrument enables to implement the efficient ways of the description of roughly defined systems, which cannot be analyzed with standard quantitative mathematical methods. So the quality of investment decisions must rise.

Keywords: project efficiency assessment; innovation; real options; knowledge economy; fuzzy sets; investment risks.

JEL classification numbers: O22, G31

1. Introduction

Modern economy is characterized with growth of value of innovative factors of development. Innovative projects are connected with a higher risk level. It shows the necessity to develop new methodological approaches to an efficiency assessment.

The main methodology of the efficiency assessment of projects uses both the investment and the financial analysis, based on the principle of discounting of cash flows. This methodology does not possess administrative flexibility, does not estimate the factors connected with the uncertainty of results and often does not show the efficiency of the project. The novelty of the offered research is defined with the integration of the mechanism of fuzzy logic into the tools of the assessment of real options. Expected result is the increasing of efficiency of project management, based on providing high degree of administrative flexibility; fast response to changes in the external and internal factors, that can provide optimization of investment expenses for innovative programs. The key problem is the correlation of expenses and results of innovative projects realization.

2. The knowledge economy challenges

[87] Elena Tkachenko, Dr. Sci. (Econ.), Professor at St. Petersburg State University of Economics. E-mail: eletkachenko@yandex.ru ; Vadim Klimov, Candidate of Economic Sci., Researcher at Centre of Scientific Research, St. Petersburg State University of Economics; Vladislav Klimov, Candidate of Economic Sci., Researcher at Centre of Scientific Research, St. Petersburg State University of Economics; Vyacheslav Nabizadi, postgraduate student at St. Petersburg State University of Economics

The knowledge economy imposes high requirements to enterprises. The competitiveness of the enterprises in conditions of the knowledge economy directly depends on the successful modernization. Nowadays there are many researches, devoted to the problems of modernization, therefore a vast variety of representation of the given term has appeared.

In the tradition of sociopolitical sciences, modernization is a process of social changes due to which traditional societies (their way of life is based on the including of all innovations into the tradition and the preservation of this tradition) are transformed into "modern" ones (their way of life is based on the accepting of innovations and constant reconsideration of tradition from the standpoint of innovations).

Modernization of economy is a process of changes of the institutional kind, characterized with either the imitation or the copying of a positive experience of developed countries, or designing its own program of modernization, considering the internal conditions.

With positions of applied economy, modernization (from Greek moderne - the newest) is an improvement, updating of an object, bringing into conformity with new requirements and standards, specifications, parameters of quality (Raizberf B.A & all, 2006).

Modernization is a bringing of the resource potential of the industrial enterprise into conformity with current or future expectations in conditions of the innovative economy, revealed as a result of interaction of the objective and subject factors not contradicting the institutional environment and decreasing transformational expenses on the providing of temporarily monopoly of the current or future periods. Having analyzed these approaches, we will consider the modernization with reference to the industrial enterprise on the system and the subsystem level.

In our research the system modernization of the industrial enterprise means a process of continuous complex development of the managing subject, using all accessible progressive approaches to the management of organizational and industrial system, in order to provide the strategic competitiveness of the enterprise.

Correspondingly, the modernization of industrial system means a process of constant improvements, providing the creation and the saving of the competitive advantages of industrial genesis.

The technological modernization means a process of the cyclic innovative transformation of the enterprise industrial base, providing a high quality of processes, production and services.

All in all, the management of the enterprise modernization should include the management of organizational development and the management of the industrial base development (Figure 1).

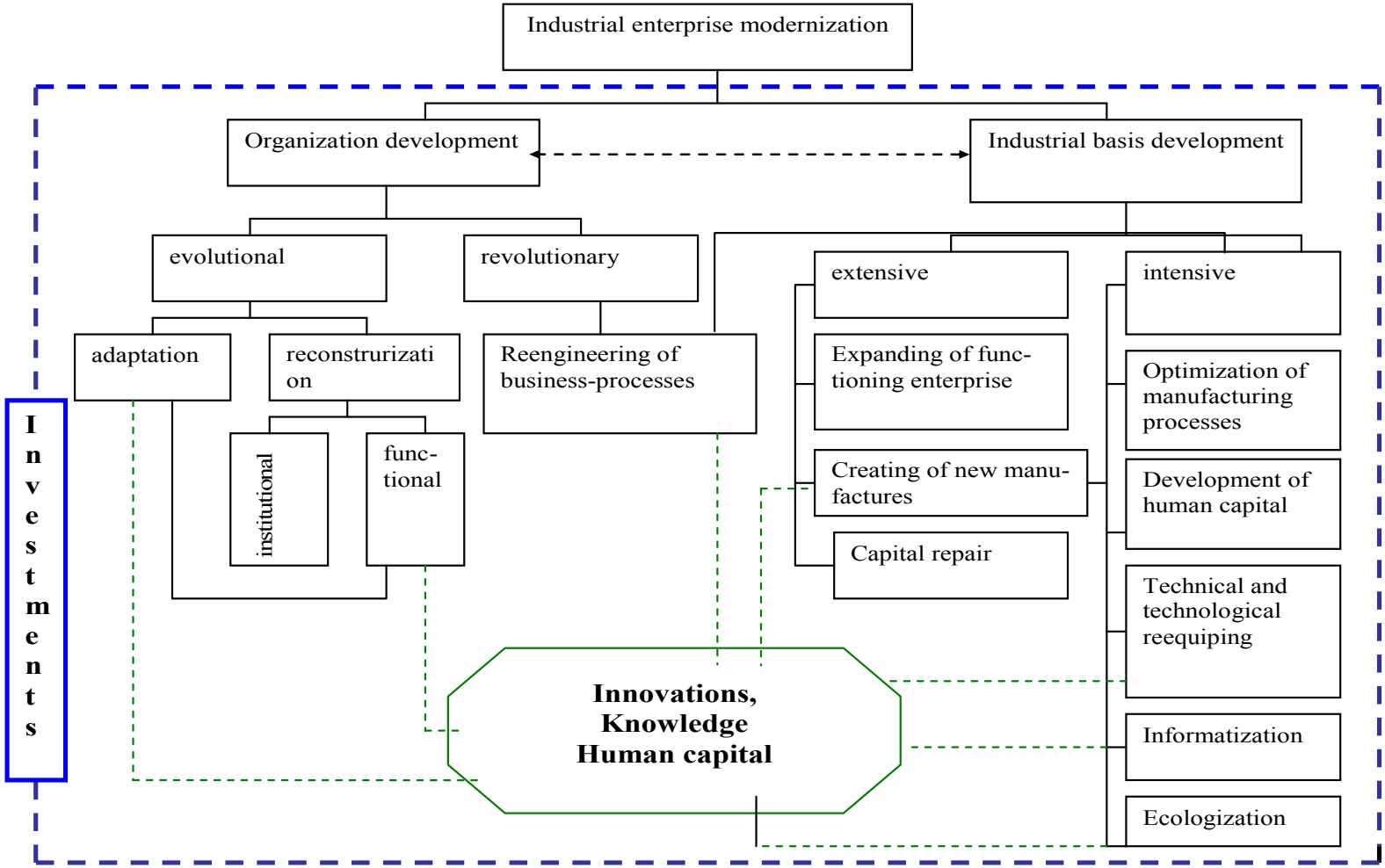


Figure 1. Directions and forms of the industrial enterprise modernization.

In modern conditions, the defining factor for the functioning and the development of the economic system is efficiency. Innovative transformations, effective for one enterprise, can be inefficient for another one due to certain objective and subjective factors. It can be difficult to estimate quantitatively many of these factors, and in some cases it is impossible, however they influence on the final efficiency of innovative activity.

As a result, the enterprises should constantly have in mind real conditions of economic changes, or form special mechanisms, providing and increasing their innovative activity efficiency, which allows to predict the future changes and to develop adequate ways of reaction.

Qualitative shifts, defining the modern economic situation, are based on the innovative orientation of strategy and tactics of production development. Changes of production factors are defined with their increase of economic, innovative and organizational components.

3. The Project cycle in point of view of the time nonlinearity

The problem of the efficient management of the enterprise modernization projects is connected with understanding of project cycle. Actually, project (modernization) cycle is a length of the wave of the enterprise development cycle. According to the concept of nonlinearity of time current in economic systems, the S-curve, describing a set of cycles of the enterprise development of the enterprise, is non-uniform, depending on the speed of modernization processes. In the case of the project management, the manager has at his disposal only one cycle with which the highest efficiency should be provided. It is the main difference between the project management and the regular one.

Wave is a change of an environment or a field, moving in a space with a certain speed. Every wave has a length, which is a distance between two peaks of the wave.

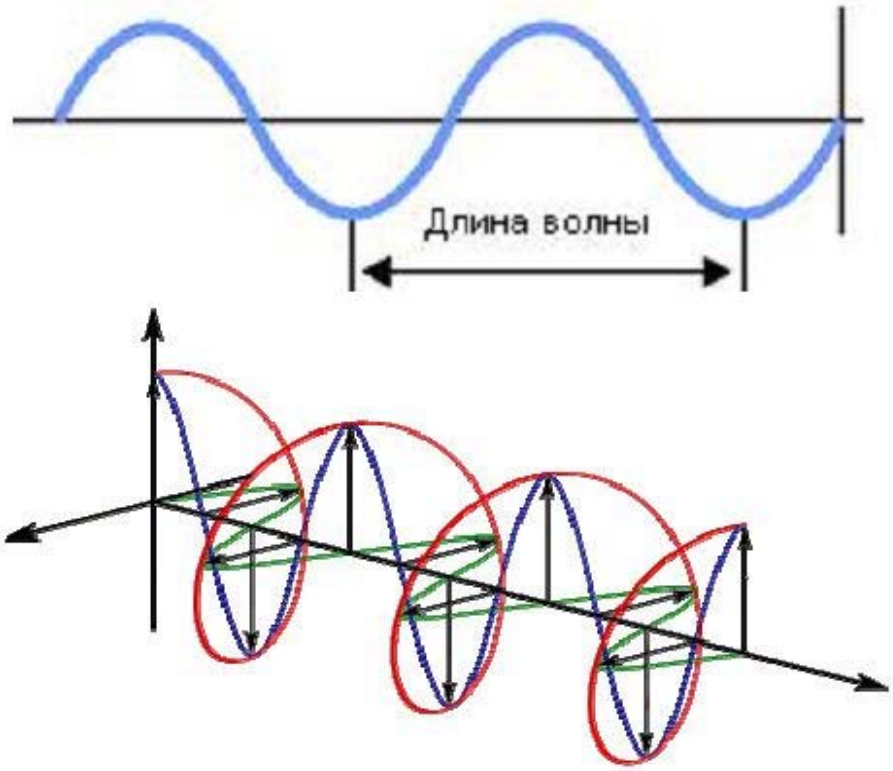


Figure 2. The cycle of the enterprise development in multi-dimensional space time-efficiency (the author of the picture is N.N. Alexandrov)[88]

In the Figures 3a and 3b there are a projection of a project live cycle and an enterprise cycle on a phase plane:

[88] http://forum.masterforex-v.org/index.php?showtopic=18516&st=165

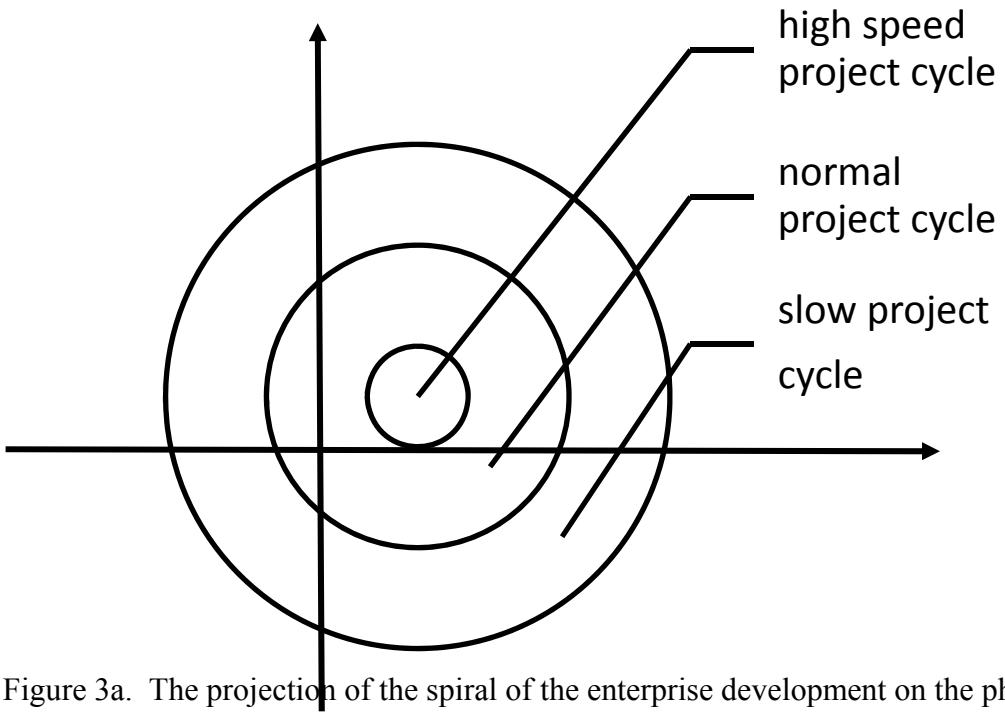
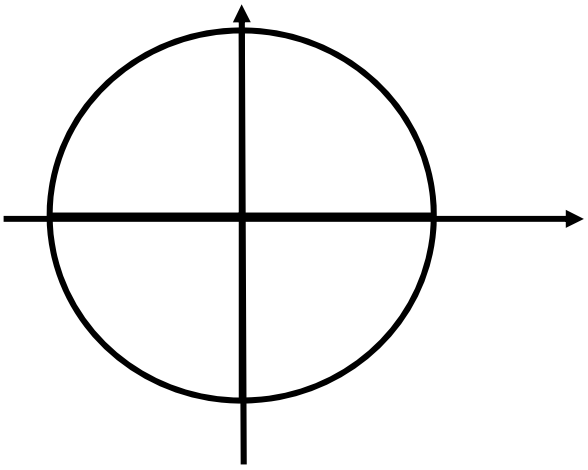


Figure 3a. The projection of the spiral of the enterprise development on the phase plane.



Picture 3b. The projection of the project life cycle on the phase plane

4. Modern approaches to assessment of the project efficiency

During many years one of the most popular methods to describe investment attractiveness of projects have been the classical dynamic methods based on discounting of cash flows (Levy H., Marshall (1978), S Williams J.B.(1990), Damodaran A (1996)). Integrated approach of projects and uncertainty of environment conditions show that over mentioned methods are not always effective, therefore in the field of the investment analysis a new direction started developing, called the methods of the estimation of real options, i.e. methods allowing to consider administrative flexibility and to estimate its influence on the total cost of an investment project.

Real (administrative) options are options, whose basic assets are real assets of a firm. Stewart Myers (1977) was the first to use the term «a real option» in his book «Determinants of Corporate Borrowing» , where the features of real options are considered. A plenty of researches are devoted to real options, among them are E.Schwarz and M. Brennan(1985), L.Trigeorgis (1985), A.Dixit and R.Pindyck(1994), A.Damodaran (1996), T.Coupland & all(1993).

At present, there are many methods and models of estimation of real options cost, and most of them is based on either the finite-difference method and partial differential equations, or lattice methods, or simulation modeling method. The binomial model is one of fundamental and the most widespread discrete methods of cost estimation of real options and is an example of lattice methods. It was developed by John Cox, Stephen Ross and Mark Rubinstein (1995). Relative simplicity of the mathematical methods used and high accuracy of received results made it one of de facto standards in the field of cost estimation of real options. The binomial model is based on the construction of a binomial tree for the set quantity of time periods between the date of cost estimation of an option and date of its expiration. Each unit of the tree represents possible cost of the basic asset at a certain moment. In this model each period of time can have only two alternative changes of the asset cost: to increase or decrease.

The administrative management often finds itself in situations, when initial conditions of a goal are indistinctly defined. Such situations show that a person making decisions (PMS) is badly informed.

The used information can be subjective, and its representation in language of people, as a rule, contains a huge number of uncertain terms like "much", "not enough", "approximately" which have no analogues in the language of mathematics. Therefore the description of this information with terms of traditional mathematics extremely simplifies the mathematical model. As a result, it was necessary to create a new mathematical vocabulary in order to use mathematical methods for the researching and the analyzing of the system, which are gradually becoming more complicated. This vocabulary must allow to describe uncertain things, which a person operates, describing one's desires, purposes and the like concerning the system.

The founder of the theory of fussy sets is American mathematician Lotfi Asker Zadeh (1965). Since then there were 3 main periods of the development of researches in the field of fuzzy sets, where principles of fuzzy sets and their practical use was described (L. Zadeh (1965,1970) , D.Dubois & H.Prade (1996) , R.Bellman(1970); the practical implications and the efficiency of fuzzy logics were proved (Buckley(1992,1993) , B.Kosko(1992) , P. Cheeseman (1986); at last, an active distribution of the fuzzy logics in various branches and popularization of the basic algorithms (E.Kofler, E.Mamdani(1977, 1981), T.Sugeno (1974, 1985,1992), Ingle, M., Atique, M., Dahad S.O. (2011), Zhang, X. (2012), Zhu, Y., Lei, H. (2012) Iluza, M., Shtubb, A. (2015))

5. A modified model of cost estimation of real options

We are going to offer a modified model of cost estimation of real options, based on the binomial model, - polynomial model of cost estimation of options with the cost of the basic asset, estimated with methods of fuzzy logics. Its main differences from original one are the following:

- The use of the fuzzy sets theory to define the possible cost of the basic asset in every knot of the model;

- The forecasting of the changing quantity of possible variants of the change of the basic asset cost in the next period (unlike the binomial model with its 2 variants).

A final number of cost of an asset can be considered as an accurate set – respectively, it is possible to transform it in fuzzy set and to receive a linguistic term. From built-in model of fuzzy logic generation of accurate value of cost of an asset for each knot of the period will be required. From the point of view of the mechanism the fuzzy set systems is no other than creation of composition for a set of logical conclusions and a further defuzzification through finding of the center of gravity of a figure. Here we would like to pay attention that in connection with requirements of polynomial model and the offer to analyze a linguistic variable and its term set, we will estimate not the general center of a figure, and the center of each cluster corresponding to accurate value of output parameter. Moreover, we will define not only actually value of the center (its coordinate on abscissa axis), but also we will count probability of its coming (coordinate on ordinate axes). Such approach is represented in figure 4 where reduction stages to the clearness of value of output parameter, including finding of coordinates of the centers of gravity of each cluster which will correspond to values of cost of an asset and probability of an outcome.

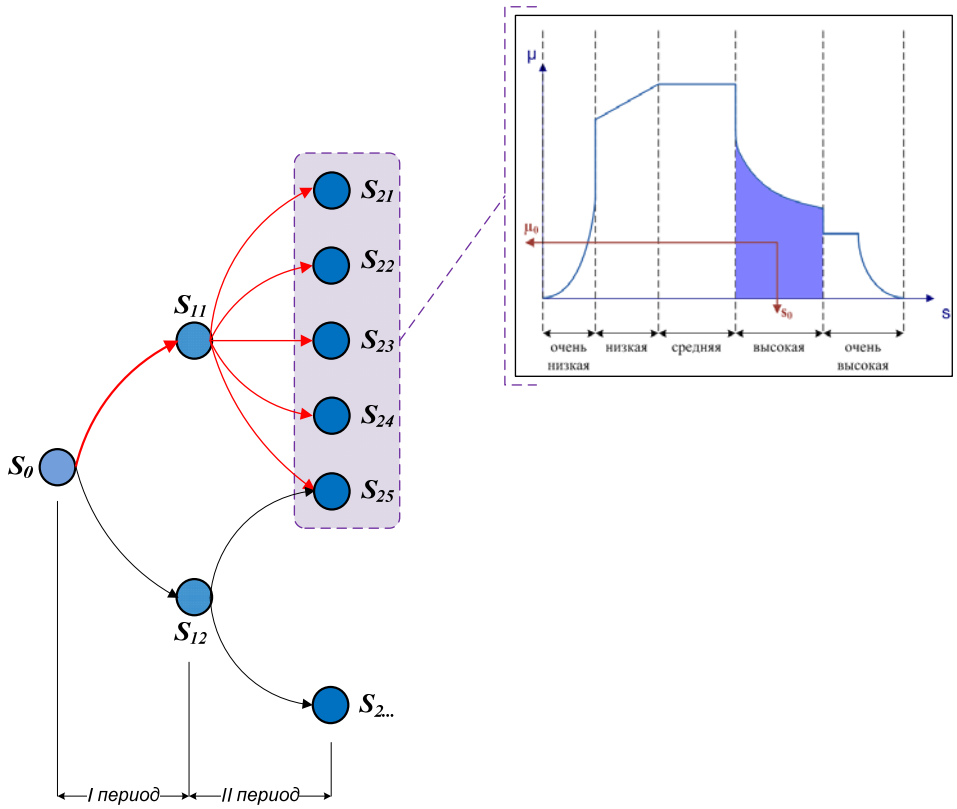


Figure 4. Example of a two-period polynomial tree

Source: developed by Klimov V. & Klimov Vl.

Conclusion

The methods, based on the fuzzy sets theory, enable to use approximate, but rather efficient ways of the description of badly defined systems, which cannot be analyzed with standard quantitative mathematical methods. Moreover, all the theoretical justification of this approach is exact enough and cannot be a source of uncertainty.

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The State Regulation of Development of Russian Northwest Regions Based on Exploration of Arctic Hydrocarbon Resources: Methodological Aspects

Vladimir E. Rokhchin[89]

ABSTRACT

The author performed a critical analysis of the effectiveness of state regulation of existing in Russian Federation state policy in relation to development of mineral resources in the Arctic. Based on the conducted research author's conceptual proposals are submitted about state regulation of industrial development of the North-West in the context of the development of hydrocarbon reserves of the Arctic zone. The main emphasis are focused on management aspects, under which variants of creation of a system for management and control of hydrocarbon production and processing are formed, and the methodological approaches to the development of objectives and principles of the coordination at various levels are developed.

Keywords: state regulation, hydrocarbon reserves, industrial policy, technological chains, management system, the goals of state industrial policy, the regions, the Arctic.

JEL Classification Numbers: R12, R28, R38, L52, L71, O38

Introduction

During the recent years, an idea of the Russian Arctic as a national larder of mineral resources was formed, and among them for obvious reasons the leading place take hydrocarbons. It is in the Russian Arctic regions raw transnational production chainsoriginate, and they cover, essentially, the whole technological cycle of production and use of hydrocarbons, and Russian participation from the position, formed within the value added, is slightly. In this regard, it is logical to ask, what is the reason for this situation, what is the modern paradigm of the state development of the Russian Arctic and the use of hydrocarbons, whether it conforms to the new geopolitical and Russian national farm conditions, how effective isit.

Experience of a number of foreign oil and gas powers indicates that over the past 20-30 years, approaches to integration of problems of development of hydrocarbon resources in a wide range of issues of economic development of the Arctic and adjacent regions havebeen developed and successfully implemented in the world [1]. However, considering the Russian Arctic as a national storehouse of resources, it is necessary, in our view, to raise questions about the development of the economy not only the Arctic coast, but in the country as a whole, based not on the sale of hydrocarbons abroad, but in the deep recycling of it mainly in Russian regions.

The situation now presents that, when Russia's largest mining corporation, acting as ties of transnational developmentproduction chains, is generally successful, until recent times, was filled with the revenue of the state budget. In turn, the federal center accepted this position as apparently quite satisfied, despite significant national economic damage arising from the loss of strategic non-renewable hydrocarbon resources, owned by all the citizens of Russia, are connected with the loss of the budgets of all levels from the foregoneadded value and etc.[2,3].

Essentially, under the "flag"of the important task of filling the state budget the inefficient use of the national heritage takes place. It is therefore necessary to strengthen state regulation of the organization and development of developmentof technological chains, to prioritize not the interests

[89] *Doctor of Economics, Professor, St. Petersburg State University of Economics*, Department of Economics and Management of Enterprises, 191023, Sadovaya Street, 21, St. Petersburg, Russia. Passed away on June 23, 2015.

of individual corporations, but national interests, because the contents of mineral resources (including oil and gas) according to the applicable legislation belong to the entire population of the country.

The development of development of technological chains with Russian participation as an object of state regulation

Let us now consider some fundamental issues of development of technological chains with Russian participation as objects of state regulation. General terms and conditions of the national economy are discussed in a number of studies [4,5]. With regard to the subject matter of this work among such requirements, we should note the social orientation of the development of chains, what stems from constitutionally secured position that Russia embarked on the construction of the welfare state, as well as providing effective national economic development position. In the latter case we are talking about the use of a methodology for assessing economic efficiency of development of technological chains with Russian participation, involving a comparison of all received within the process chain of effects, and, of course, indirect, to determine their cost.

Moreover, considered raw technological chains and their individual links can be examined as poles of economic development of the regions-places of their deployment, promoting the launch of a real process of restructuring their economies, to participate in the formation of the support of frame of the spatial organization of the economy.

The effects derived from the adoption and use of Arctic hydrocarbons may consist not only in the strengthening of the state budget by selling them abroad, but mainly in the form of indirect benefits, consisting, for example, in the launching a process of real economic restructuring of Russian regions, implementing deep recycling of selected mineral resources [6].

Therefore, an important requirement for the development of development of technological chains with Russian participation, is to harmonize the processes of modernization of existing and construction of new enterprises for deep recycling of primary mineral resources to the development of industrial and social infrastructure, solving the problems of providing employment, improving its labor skills provision where necessary, effective help in some cases in moving the workforce around the country, etc.

The practical implementation of such requirements for the development of development of technological chains with Russian participation implies compliance of several conditions of a fundamental nature. These include: strengthening of the role of the state in the economic regulation of the considered technological chains, a departure from the ongoing economic bloc today, the Russian government “liberal” approach to economic development; strategic use of instruments of state regulation of development of technological chains with Russian participation [7], including economic efficiency audit of their organization and development [8], the creation of highly skilled and motivated on the support of the country’s political leadership reforms in the area of economic development management.

Choice of the structure of the state regulation of development of technological chains with Russian participation in North-West Russia

For the reasoned choice of structure of state regulation of development of technological chains with Russian participation, performing presentation about economic interest, first of all, the economic dimension of the space in which such function chain should be determined. As a rule, their activities are carried outwithin a few regions of the Russianregion-subjects. Therefore, activity is based on currently accepted administrative-territorial structure of Russia, it can be assumed that the economic area, in which the formation and development of technological chains under consideration is within of a macro region of the district of Russia.

Then state regulation of the development of considered technological chains can be implemented by the structure created at the level of the Russian Federal District. Considering that such raw chains originate in the Arctic zone of Russian Federation, it seems appropriate that the

structure of state regulation of its development are situated in one of the Arctic regions. In the case of more large-scale projects related to the organization and the development of development of technological chains with Russian participation, we should talk about economic space of the counrty; for example, the Ministry of Economic Development can act as a subject of government regulation.

Consider for definiteness options of location of the research center to ensure state regulation of the considered technological chains with Russian participation in the North-West of Russia [5]. Of course, the city of Arkhangelsk is appearing as a first candidature, because of the establishment of the Northern (Arctic) Federal University there, which in principle could take over the function of the Coordination of Economic Research and project work on the Arctic topics within the North-West Federal District.

However, lack of scientists of higher qualification – Doctors of Economics, specializing in the actual Arctic issues; lack of Arkhangelsk research institutes of economic profile, directly involved in the economic aspects of the development and using Arctic mineral resources will not allow, in our opinion, the Northern (Arctic) Federal University foreseeable futurefully provide comprehensive intellectual support for the activities of proposed to the organization in Northwestern Federal District structure, whose functions will include development and implementation of major projects on the development and use of the Arctic mineral resources

Another candidate for the placement of the center for studying state regulation of the development of thetechnological chains is the largest city in the Russian Arctic - Murmansk. On the base of the Murmansk State Technical University Northwest research center of maritime policy therewas created and has been successfully operating for several years. The presence of a large detachment of doctors of economics helped organize and provide effective work of the only one in the European North of Russia specialized Dissertation Council on the issue of regional economic development, which brings together scientists of Murmansk, St. Petersburg, Arkhangelsk, Petrozavodsk and other cities of the North-West of Russia. The university has close ties with the Kola Science Centre, and several Moscow and St. Petersburg research institutes (Institute of Oil and Gas Problems of RAS, Institute of Regional Economy of RAS, CAS Ministry of Economic Development and the Russian Academy of Sciences, State Economic University, as well as the Maritime Board under the government of the Russian Federation, etc.

This allows the University to carry out comprehensive studies, in particular, on the issue of economic development in the Arctic, and conduct annual All-Russian scientific-practical conference as a result. Therefore, placement of the Arctic Centre of state regulation of the development of technological chains in Murmansk today seems quite justified.

Let us now consider,which basis is advisable for creationof the structure of state regulation of the development of technological chains with Russian participation, working on raw materials in the Arctic North of European Russia. Obviously, in the general case that administration subjects RF regions are not suitable for this role, because:

firstly, the solving of the problems of the organization and regulation of development of the raw chains with Russian participation is carried out in the economic space, significantly going beyond of individual subjects of the Russian Federation;

Second, the activities of transnational technological chains with Russian participation, running through the territory of a number of subjects of Russian Federation, almost not regulated by regional administrations, and their economic interests often consist in competing with other regions of the federal budget transfers, but not at improving the functioning of such chains with the national economic position [6].

In turn, the federal districts of the Russian Federation as a major macro-regions of the country could regulate the activities of transnational chains with Russian participation, and in accordance with current legislation, they are really have to ensure the development of inter-regional integration processes within the county level [7, 8]. However, it should be borne in mind that at present the majority of Russian federal districts are not subject of economic regulation, and have no real opportunities to address the problems of increasing of the economic efficiency of transnational technological chains with Russian participation.

However, in the recent yearsa number of federal districts of the country set up the structure of state regulation of economic development - the relevant ministries (Crimea, Far East, North Caucasian Federal Districts). However, the relevant legal documents emphasizes that such structures are created only in the troubled federal districts.

As for the federal level of economic regulation, there is also no special structures whose function are consist of solving the problems of the development of the chains. Therefore, it is appropriate to create in the federal districts the departments of Economic Development of the Russian Federation headed by the leaders at the level of deputy federal minister. The structural division of the Department on the North-West of Russia, whose functions would include the development and implementation of state (regional) economic policy in the regulation of raw Arctic technological chains with Russian participation, can be established in Murmansk, and a number of specialized units of the Murmansk State Technical University could implement the functions of its working body.

Methodological aspects of the development of regional (within the Russian federal district) economic policy in the sphere of development of the technological chains with Russian participation

Due to the present time the methodological aspects of regional (district) economic policy in the sphere of development of the technologicalchains with Russian participationare not practically designed, we will try to give in priority to produce clarification of its nature and the subject.

Most researchers consider regional economic policy as a certain set of events (actions) of the structures of state regulation of the region's economic development, realizing a substantially active approach to the determination of its essence. But the activity is not an attribute immanently inherent to the regional economic policy, it only serves one of the certificates (not the only one) fact of politics, so in the case of appropriation of such an interpretation of the essence of regional economic policy it will be virtually the same as the definition of the program or focal plan, making it difficult to agree.

It seems more constructive to make a definition of the essence of regional economic policy, introduced in [9] as "…a system of intentions and actions that implement the interests of the state in relation to regions and domestic interests of the regions".According to thisinterpretation the regional (district) economic policy serves as one of the componentsof the national economic policy. It is linked with the regional spatial economic policy - in terms of the distribution of productive forces, the use of natural resources; with regional foreign economic policy - in terms of increasing the efficiency of the Russian industrial enterprises' activity through activating cross-border links; with regional structural economic policies with the regional policy of "knowledge of economy", etc.

Then the essence of the district economic policy in this sphere can be defined as a set of intentions and actions implementing the economic interests of the state.Its appointment is to justify the choice of its subject (subjects) of the priority types of activities for the development and using Russian Arctic mineral resources, the provision of their effective state support. We can specify two kinds of complementary district policy: firstly, policy of the district section of national economic policies in this sphere, and secondly, the actual district economic policy.

What are the major economic interests of the state in the Russian North-West? It seems that they are the follow: firstly, to ensure a high quality of life within the North-West Federal District on the basis of overcoming the depressive trends in the macro-economy; second, in the implementation of their strategic priorities and objectives of national importance arising under the (predicted) nationwide division of labor [10]. Then the intentions and actions of state structures should be directed to the transformation of the Russian North-West region in an economically self-sufficient region; in order to solve the problem there should be identified strategic targets marks of the district economic policy. In this case, the organization of the Arctic deep recycling of Arctic mineral resources at the processing enterprises stationed within the federal district may be considered as one of the key factors in the implementation of selected national interests.

We have tried to identify the core of the subject of district economic policy in the given sphere – it is a specialized unit (presumably department) of the Ministry of Economic Development in the

Federal District. However, it should be kept in mind that in reality the subject of a district policy has a complex composition, may include in addition to its nucleus so called actors of influence - other structures of governance and management, including foreign ones, having economic interests in the development and using the Russian Arctic mineral resources.

Relation between the objectives of economic development within the North-West federal and regional (district) economic policy development of the Arctic resources

Let us now consider the methodological aspects of the formation of the goals of economic development of a macro-region and state economic policy of the district, the elucidation of their relations. The relevance of such a formulation of the problem is due to the fundamental fact that today's frequent opinion is that, for example, the state economic policy have to be directed on support a particular sector of the economy of the region, and its objectives coincide with the objectives of its economic development. It seems that this position is wrong, so we will try, first of all, clarify the nature of the underlying concepts of "economic policy of the district".

In the collective monograph [11] on the basis of a detailed analysis of existing approaches to the definition of "region" it is shown that the main feature of the region is as a category economic and geographical unity and integrity of the reproductive process should to be considered, based on the formation of inter-sectoral structures with relatively closed production cycle. Such an interpretation of the definition of region outlines its boundaries with economic conditions of the greatest economic feasibility, implementing, essentially,a well-known principle of territorial organization of society - the principle of the unity of economic and administrative boundaries. Hereitis, essentially, aneconomicregion.

However, the history of formation and development of the domestic administrative-territorial structure strongly suggests that in the process of the organization of the Russian regions of different rank - federal districts, subjects of the Federation and municipalities primarily reasons of political expediency were taken into account, and economic factors were considered as a secondary, optional.

In modern conditions, when the border of the Federation's regions have already adopted constitutionally, any change to the administrative - territorial unit is connected with the amendment of to the Basic Law that, in general, not simply in terms of the adopted procedures for such amendments. In addition, and most importantly, the legislator seeks to minimize changes in the Constitution. Therefore, in this paper we will mean an administrative macro-region by Federal District.

Under the regional economy, itis generally taken to mean his farm, which includes all businesses, organizations and institutions in its territory. Then the concept of "economic development of the macro-region (Federal District)" can be defined as a complex process of change of its constituent elements (material production sphere, the sphere of non-material production, environmental spheres), leading to their qualitative transformation and, ultimately, to change of the living conditions of people in the region.

Let us now clarify the concept of macro-economic development purposes. Here it is methodologically important to consider the concept of purpose in relation to the concepts of "activity", "need" and "interest". It is obvious that these concepts are interrelated: there is no activity without the need for it, there is no need that is implemented of work; in turn, interests are closely related to the needs, act as a means of satisfying them. Then focus as a kind of conscious human activity always reflects the very specific needs and interests of the subjects of macro-control economic development. This implies, firstly, the primary of the needs with respect to the interest; secondly, a deep study of the needs and interests of the subjects of regulation and management, involved in the strategic development of the economy in the macro-region, it is a necessary condition of the scientific goal-setting.

We can distinguish the following basic steps of determining the macro-economic development goals for the long term:

- Formation of the scenarios conditions of a perspective development of a macro-region's economy, including functions of a strategic analysis of the key factors determining its economic development; determine of its strategic choices; strategic positioning, forming their own scenarios of its long-term economic development;
- Scenario planning of a long-term economic development of the macro-region, which includes the generation and analysis of the main possible scenarios of development of its economy, determined by the influence of factors external and internal; development of the optimal parameters of a long-term forecast targets, consistent scenarios of economic development.

In accordance with the conclusions of the work [12] we consider the scenarios conditions of the perspective development of the macro-region as a set of factors that determine and may affect the nature and parameters of regional economic development. With regard to the definition of the essence of the scenario of regional economic development of the region, we are in full agreement with the position of authors, who believe that the scenario [12] are a set of macro-economic, resource and institutional parameters that have a significant impact on the region's economic development perspective.

Attention is should be drawn to the fact that we can talk about economic policy in the macro-region as a territorial cut of the national economic policy. At the same time, such a policy can act in another incarnation - as the economic policy pursued by the Federal District itself. Thus it seems clear that in the first case the goal of the state policy in the Federal District are given "from above".

As for the actual objectives of macro-regional (district) economic policy, they are designed to reflect the interests of the structures of state regulation of economic development within the federal district. In this regard, we will try to identify and briefly discuss these economic interests.

As we know, the priority objectives of a social nature is follows from the constitutionally provisions on the construction in Russia of the welfare state. Therefore, it is logical to assume that the district government structures are interested in providing employment and high salaries to people working in the macro-region.

Besides, the economic interests of the district authorities are directed to strengthen the revenue part of the state budget and the budgets of "their" regions - the subjects of the federation, to increase the contribution of the economy macro GDP of Russia, strengthening its global economic relations, which is especially relevant in today's globalized world economy, in improving macro-economic development.

Currently, there is the priority of the aim of socialization of the national economy, an important aspect is the state of the environment as an important component of the economy of the macro-region, having a direct impact on the quality of life of the population through the state of their health. In addition, the degree of contamination of the environment is also an important factor in determining the macro-economic outlook. Therefore, the economic interests of the district authorities must consist in conducting an active environmental policy.

The results of economic development of the macro-region has a direct impact on the general economic situation in the country, on improving the quality of life of its population. Therefore, the interests of the power structures of the macro-region as a component of the state system of regulation of economic development should also consist in achieving optimal in the sense of the results of the selected criteria of economic development.

Formation of the district's economic policy objectives in the field of development of Arctic hydrocarbon resources

The overall the methodology of determining objectives of the district state economic policy is quite clear: by identifying the economic interests of the district and regional authorities, a determination of targets in the regulation of macro-economic development, and then the goals themselves are defined.

However, the reality is not so simple. First, economic power structures in the federal district are not uniform, and their individual groups have different economic interests, and secondly, there are powerful actors of control and management (including abroad) that are not included formally to the part of the district and regional authorities, but have their own interests in the development of macro economy. Therefore, there is a very difficult task of finding the true, often conflicting, economic interests of the regional authorities, their harmonization, based on the priority of solving the dual task - to ensure the required quality of life of the population of the region and the implementation of the requirements arising from the adopted (perspective) in the Russian system division of labor.

Thus, we can see that the goals of regional economic development and regional economic policies have objectively a different nature, reflect the overall contradict specific economic interests of the regional regulatory agencies and economic development. This means that the coincidence of these purposes may occur only in certain, specific cases.

Does this mean that, in principle, there cannot be a compromise between the objectives of economic development of the macro-region and the district state economic policy? Indeed, in such a "struggle" in any case, in the long term, there can be no winners, since the result of it, eventually will decrease the quality of life of the region. It therefore seems appropriate to realize the well-known principle of harmonization of economic interests of the subjects in defining the goals of economic development and regional economic policy within the federal district. In this case referred targets should be situated in the coordination state, but not subordination one another. The practical implementation of the principle of harmonization [13] means, in particular, need to develop and introduce into practice the strategic adjustment of economic development of Russian macro-regions corresponding to coordinate procedures, the use of which should be regulated and be ongoing.

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STATE REGULATION OF TRANSNATIONAL PRODUCTION CHAINS IN THE RUSSIAN ARCTIC

Elena N. Vetrova
Doctor of Economics, Professor, vetrovaelenik@rambler.ru
St. Petersburg State University of Economics, 21. Sadovaya Street, St. Petersburg, 191023. Russia

ABSTRACT

The paper presents the study of the role the mining sector in the Russian economy and proved its raw materials. An analysis of global value chains in the industry has shown a low added value of Russian companies. Analysis of changes in the structure of the economy based on the coefficients of an advancing revealed no significant changes in the structure of the economy over the period analyzed. On this basis, the authors concluded that the ineffectiveness of industrial policy of the Russian Federation as a whole, and in the Arctic region, in particular. The authors identified the problems of formation and realization of the state industrial policy in the Arctic region, analyzed the shortcomings implemented at this stage the state policy in the industrial sector of the Russian Federation. On the basis of studies formulated conceptual approaches to change state policy in the Arctic by the example of its European part. The basic idea is to regulate the production chains so as to increase the added value created by the Russian companies involved in the development of the Arctic. At the same time, solve another problem - the development of the manufacturing industry in the southern regions of the Northwestern Federal District. In addition, the necessity of harmonization of the purposes of state regulation of production chains and goals of the company by the criterion of increasing national economic efficiency.

Purpose: To develop recommendations for improving the national economic effectiveness of the implementation of the Arctic projects based on conceptual proposals for state regulation in the region.

Methodology: the concept of global value chains, and compare the statistical analysis, systems analysis, situational analysis of the market, forecasting techniques, methods of expert evaluation.

Keywords: global value chain, Arctic, Mineral Resources, government regulation, industrial policies, technological chains in the Arctic zone, industry, efficiency, objectives, harmonization.

JEL Classification Numbers: F63, L52, O13, O38, R12, Q48

INTRODUCTION

The growth of the global value chain during the last two decades not only significantly changed the nature of the world economy, but also had a strong influence on individual countries. The positive impact of global value chains is achieved due to the multiplier effect of investment in the economy. At the same time, there are negative aspects of global chains, in particular, the replacement of a national market enterprises – residents includes it, resulting in a loss of added value for the national economy.

In recent years the image of Russian Arctic as a national larder of mineral resourceswas formed, and among them hydrocarbons dominates. In connection with it, the problem of effective using of these sources becomes actual. The raw orientation of the Russian economy is recognized by everyone, and the government is taking steps to change this situation. It is necessary to ascertain the effectiveness of the existing industrial policy in regard with the development of the Russian economy in order to correct it in a timely manner with respect to the Arctic zone.

METHODOLOGY

The methodology of the research is based on scientific works of Russian and foreign scientists in the area of world economy and governmental regulation.

Therefore, to determine the role of the mineral and raw resources of Russia in the global and national economy we used the theory of comparative advantage, which utilizes indicators proposed, for example, by D. Greenway, C. Milner in 1993.

Analysis of the effectiveness of Russia's participation in the global mining and manufacturing sectors is performed with using the concept of global value chains spreadin 1997first as a concept of commodity chains which focused on logistics flows, and then, from the beginning of 2000, on value chains. Major factors of the organization of global industries are determined in frames of these chains, a theoretical basis and practical tools for analysisof the value chains and different types of management are offered [17].

There are different approaches to the analysis of global value chains. First of all, it should be noted the use of a number of quantitative parameters, in which the most widely used:

1) Index of vertical specialization (VS) [20]. This indicator is based on national inter-sectoral balances and was introduced for the first time by Hummels D., Ishi J., Yi KM and later was used in the works of Backer K., Yamano N. [16] and Miroudot S., Ragoussis A. [21].

2) Measure of vertical specialization (VS1), representing a share of exports goods and services used as an intermediate import for production of export goods of the other countries, proposed by Hummels D., Ishi J., Yi KM [20].

3) The index of participation in global value chains calculated as a share of foreign intermediate goods and domestically produced intermediate goods used in the exporting to the third countries (percentage of gross exports is a statistical measure).

4) The length of the chains, measured by the index, interpreted as a real number of manufacturing steps and calculated on the basis of inter-industry balances: Dietzinbacher E., Romero I. [18], Fally T. [19], Antras P., Chor D., Fally T., Hillbery R. [15]. The minimum value of the index is equal to one, when intermediate goods or services are not use for the production of the final product.

5) The indicator of the distance of the final demand, indicating the number of manufacturing steps, which the product or service must pass on the way to the final user for a specific industry and individual countries [19].

Besides, we should notethe methodology of R.Kaplinski and M.Moris [5], aimed at obtaining expert assessments of a wide range of respondents who are inside the chain, and outside of it, on order to characterize the circuit chain accumulation value, to determine the composition and role of its members, to identify potential for growth of added value in a globalized market.

The importance of global value chains is recognized by all of the participants of the world market and, therefore, the OECD in cooperation with the WTO developed a methodology to assess the trade flows in terms of added value on the basis of cross-country, cross-sectoral balances and full matrix of bilateral trade flows. ICIO model allows analyzing in details of global value chains and transactions between different sectors and countries in 37 sectors of the global economy [Op. 7].

The contribution of Russian scientists should be also noted. Thus, we used some theoretical and methodological position of M.R.Safiullina, A.A.Safina [10] which consider production and processing chain in relation to the mining and petrochemical industries in Tatarstan. The works of V.B. Kondratyev, who systematized the work on global value chains and conduct comparative studies in different in different industries for different countries, are also very valuable. [7]

Sampling study of the problem of global supply chains is considered in a number of works from the perspective of competitiveness management integrated companies [1, 8].

Problems of researching and developing the Arctic are discussed in the scientific literature quite active, but at the same time, in most cases they relate to certain aspects: environmental, technical, social, economic and others. In particular, the works of the authors of this article exploring the challenges of the regional economy and Industrial Policy should be noted [2, 3, 6, 12]. However, we have not identified comprehensive research features and state of development of the Arctic zone from a position of participating in these processes, global supply chains, state regulation of these processes from the perspective of national economic efficiency.

An analysis of global value chains in the Arctic is of interest in terms of the methodology because:

• under the sanctions there are several problems connected with participation of individual countries and companies caught by those sanctions, and this fact puts a number of projects in jeopardy and determines one of the ways to solve the problem by the revision of the composition of the participants in terms of risk mitigation, value added and national economic efficiency;

• companies of different countries take part in the global Arctic chains, and there aresome objective complexity of counting the results of their participation, and therefore the analysis of added value by the participating countries and activities.In addition, statistical data are processed in different countries in different ways and there are some problems of comparison of these results to a greater

extent this applies to the added value in some regions, for example in the Arctic; herewith, the Arctic zone of Russia formally limited to certain areas, will be a subject of Russian statistics only in 2015.

RESEARCH

To clarify the role of the mineral and raw resources of Russia in the national and global economies researches are conducted with using the theory of comparative advantage (Table. 1). For the calculation of the indicators the official statistics of the Russian Federation are used [14]. The research results show the comparative advantages of mineral products compared with the total volume of foreign trade activities of the Russian Federation, whatis achieved due to the predominance of export over import component.

Analysis of the participation of Russia in the global chains is madeby offering the international statistics [22]. The results (Table. 1) reflect the low level of vertical integration (VS), a relatively low contribution of mining (8.6 - 18.5%) and manufacturing (3.6 - 7.6% for mineral products) enterprises in Russia in added value, created by the global chains in the analyzed period. The length of the chains in the mining industry is slightly higher than its average level in the industry, which traditionally is the minimum [7].

The results prove the raw nature of foreign trade activities, clarify the fact that the comparative advantages of mineral products are reached mainly due to exports of resources, the degree of vertical integration is low. This fact allowsto claim that these comparative advantages are tactical in nature and do not ensure the competitiveness of the Russian economy on the world market in the long term because, firstly, the mineral and raw resources are limited, and secondly, the added value created by Russian companies in this sector of the economy is limited, and consequently, people's economic efficiency is limited too.

Table 1

Analysis of the comparative advantages of Russia

indicators	2000	2005	2008	2009	2010	2011	2012	2013
Export bln. Rub.	103,1	241,5	467,6	301,7	397	516,7	524,7	526,4
Exports of mineral products,bln. Rub.	55,5	156	326	203	272	368	374	377
Import, bln. Rub.	33,9	98,7	267,1	167,3	228,9	305,8	317,2	317,8
Imports of mineral products bln. Rub.	2,1	3	8,3	4,1	5,2	9,9	7,5	6,9
RSA_1in total	0,5051	0,4198	0,2729	0,2866	0,2686	0,2564	0,2465	0,2471
RSA_1mineral products	0,9271	0,9623	0,9503	0,9604	0,9625	0,9476	0,9607	0,9641
RSA_2,mineral products	0,0076	0,0022	0,0003	0,0010	0,0006	0,0002	0,0003	0,0003
VS, mineral products	0,0204	0,0124	0,0178	0,0136	0,0131	0,0192	0,0143	0,0131
The length for all sectors of the global economy	1,81	1,82	1,86	1,83	н/д	н/д	н/д	н/д
The length of the chains in the mining industry	1,8	1,6	1,5	1,6	н/д	н/д	н/д	н/д
The length of the chains in the manufacturing industry, mineral products	1,8	1,9	2,0	2,1	н/д	н/д	н/д	н/д
Participation in global value chains, in total, percentage	38,8	49,3	51,0	44,9	н/д	н/д	н/д	н/д
Participation in global value chains, extractive industries, percentage	8,4	18,5	17,8	17,5	н/д	н/д	н/д	н/д
Participation in global value chains in the manufacturing industry, mineral products, percentage	4,7	6,6	7,6	5,1	н/д	н/д	н/д	н/д

Note: A) $RCA_1 = (X_{ij} - M_{ij}) / (X_{ij} + M_{ij})$–Index ofthe «revealed comparative advantage» including the export and import of the product that allows us to define the comparative advantage based on intra-industry trade (D.Greenway, C. Milner, 1993 г.), whereX –

export, M – import, i – the studied country, j – commodity (or areaof industry); Б) $RCA_2 = (X_{ij}/ X_{it}) / (M_{ij}/ M_{it}) = (X_{ij}/ M_{ij}) / (X_{it}/ M_{it})$ - comparative advantage index, offered byD.Greenway, C. Milner, based on the equality of Balass, whereXandM – export and import, i – country, j – commodity (or areaof industry), t – group of commodity (or areaof industry); Б) The index of vertical integration VS - the share of imported goods in the total exports of the country

Analysis of the dynamics of investments in the Arctic region and its main production resources has shown virtually no correlation of capital investments and their impact, which means inefficient investments (Fig. 1).

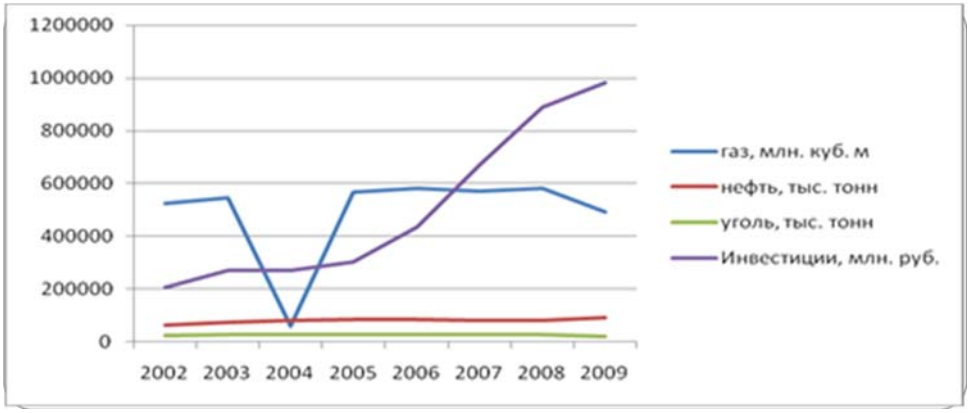

Fig. 1. Dynamics of investments and production of basic resources in the Arctic

In our opinion, one of the main reasons of this situation is inefficient industrial policy in relation of using of mineral and raw resources in the Russian Federation, including the Arctic zone. As additional arguments we will present the results of the analysis: the share of added value in various sectors of the economy (Table. 3), the coefficient of the lead industry (Table. 3) and the forecast of the index of the participation of Russian companies in global chains (Fig. 2).

Table 3

The dynamics of the mining and manufacturing industries

Indicators	2010	2011	2012	2013
Gross added value (mining), percentage	34,00	35,70	37,50	37,30
Gross added value (manufacturing), percentage	52,50	51,80	50,80	51,10
Coefficient of advancing extractive industries	0,96	0,97	0,98	1,01
Coefficient of advancing manufacturing industries	0,97	0,96	1,07	1,08
Coefficient oftiming of crude oil and natural gas industry	0,95	0,96	0,97	1,01
Coefficient oftiming of crude oil and natural gas mining industry	0,99	0,99	1,00	1,00
Coefficient ofadvancing the production of coke and petroleum products for the mining industry	1,02	1,02	1,02	1,01

Note: The coefficient of timingis calculated as the ratio of advancing growth of certain types of activity (industry) T_{branch} to the growth rate of group activities (all industries) $T_{industry}$

The results allow to state that the added value of the extractive industries is more than 30%, which confirms the raw nature of the economy. Comparative dynamics of coefficients of timing shows no obvious changes in the economic structure. Consequently, the state industrial policy does not affect the economic development of the Russian Federation, which proves its inefficiency.

Besides, basing on available data (up to 2009) we carried out an approximation of the changing of the index of participation of Russian companies in global value chains (Fig. 2), which

shows that in the current period it was possible to achieve its growth to 2.5 (High accuracy), provided an efficient state industrial policy.

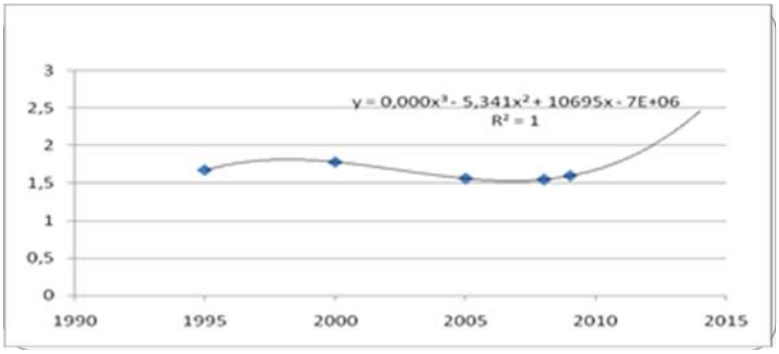

Fig. 2. Changes in the index of participation of Russian companies in global chains

Thus, Russian economy, despite all the efforts of the state, stays predominantly raw, so, among other reasons, the Arctic, continental shelf is attractive for development, because in favorable conditions it is estimated by Ministry of Economic Development of the Russian Federation as capable to provide by 2025 up to 25% of Russian oil and up to 30% - of gas [13]. In contemporary conditions of political, social and economic instability natural resources using of the Arctic shelf opens up new opportunities for economic development of the country. A unique resource potential of the Russian Arctic strengthens Russia's geopolitical position in the world community, promotes its integration into the world economy and getting certain benefits for the national economy. At the same time, investments in the development of the Arctic zone do not give due returns at the present stage.

In our opinion, the problem lies in the fact that in the Russian Arctic areas transnational technological chains originate, that cover almost all the technological cycle of production, development and use of hydrocarbons, herewith Russian participation from the position, formed within its added value, is slightly. In our opinion, this situation needs to be corrected.

In the current situation activities of the biggest Russian mining companies, functioning as links of transnational production, are the main sources of replenishment of the state budget. As a result, irreplaceable resources, a national treasure, are used irrationally.

Therefore, it is necessary to strengthen state regulation of the processes of organization and development of technological chains, defining as criteria national interests. This means that we should use a methodology of assessing the efficiency of national economic production chains, supposing a comparison of all the getting effects, including indirect, socio-economic, environmental and others, to determine their cost.

Principles of state policy in the Russian Arctic zone are reflected in the Decree of Russian Federation's Government from 21.04.2014 N 366 (ed. in 12.17.2014) "On approval of the state program of the Russian Federation"Social-economic development of the Arctic zone of the Russian Federation for the period till 2020" and in the strategy of development the Arctic zone of the Russian Federation and procuring of national security until 2020. These documents define the objectives and priorities of the state policy in the Arctic, the degree of participation of subjects of the Russian Federation and public corporations, joint stock companies with state participation, social, scientific and other organizations. However, a critical analysis of the state program of development of the Arctic made possible to identify the following problems.

Firstly, the complete system of state regulation of Arctic territory, and therefore its object and the subject is not entirely clear. To be fair, it should be noted the establishment of the Government Commission on the Arctic, which functions and powers are in the process of determining, the identification of the control center and the formation of the Arctic project development program of the Arctic zone.

Secondly, undeservedly little attention, in our opinion, is given to such an important issue as the efficient use of Russian Arctic resources as a raw material for the development of the country, its

regions, mainly located in the more southern areas with the best conditions for the life and development of manufacturing industry. In other words, the Russian Arctic mineral and raw resources should be considered as the basis of modernization and qualitative growth of the national economy, the means of solving the major problems associated with the economic self-sufficiency of regions of the country.

The idea of providing deep recyclingof Russian Arctic hydrocarbon resources laid down in the national project “Russian North-West is an economically self-sufficient macro-region" [12], in which it is supposed to create in the regions located within the North-West Federal District, major high-tech-oriented enterprises, orientated on the deep recycling of Arctic hydrocarbon resources, producing competitive in foreign markets, including import-substituting products, what is determined, primarily, by considerations of national economic security, the implementation of the general installation of import substitution.

Besides, what is not less important, that such enterprises can act as drivers (poles) of economic development of the regions - the place of their dislocation; it is really to start the process of restructuring their economies. Essentially, we are talking about reformatting (fully or partially) of the existing transnational production chains, and we should put a base in it not only benefits of domestic resource extraction corporations, but also national interests; and solutions in this sphere should be based on the criteria of economic efficiency of planned reforms, its state audit [12].

To justify the proposed locations of the proposed to creation enterprises we conducted the research, that according to the criteria of possibilities (availability of production facilities and expertise) and the energy intensity of GDP and GRP (tab. 4) demonstrate the feasibility of placing the processing enterprises in Novgorod and Pskov regions.

Table 4

The energy intensity of GDP and GRP

Region	Energyconsumption	Relative energy consumption, calculated on GDP	Relative energy consumption, calculated by the GRP
NorthwesternFederalDistrict	226,97	1,7226	1,4056
TheRepublicofKarelia	252,65	1,92	1,5647
KomiRepublic	206,10	1,56	1,2764
Arhangelskregion	189,33	1,44	1,1725
VologdaRegion	591,20	4,49	3,6614
Kaliningradregion	106,16	0,81	0,6575
Leningradregion	257,96	1,96	1,5976
Murmanskregion	235,80	1,79	1,4603
Novgorodregion	178,97	1,36	1,1084
Pskovregion	175,96	1,34	1,0897
SaintPetersburg (city)	75,51	0,57	0,4676

The main condition for the implementation of this plan is to have the political will to strengthen state regulation in this sphere, conducting nationally oriented economic policy, in which interests and intentions of the state to the efficient use of natural resources of the Arcticshould be clearly defined. Such policies should contribute to the achievement and/or increasing of the economic self-sufficiency of the industrial regions of the country.

Russian practice convincingly refuted one of the central tenets of Russian liberalism, which consists in the fact that social justice can be achieved as a result of the free play of economic forces without using tools of state regulation, and economic transformation carried out now in the country on the base of liberal patterns has as its main result of social tensions and the growth of dissent. [20]

We consider that by conducting effective economic state policy in the Arctic region and North-West of Russia it is possible to promote activity of domestic recycling industries and regional

governments on forming strategies of creation of completely (or mostly) with Russian participation of technological chains for deep recycling of Arctic hydrocarbon resources.

The object of this policy are the transnational technological chains of the companies of mineral and raw sector with Russian participation. In the current situation,virtually unexplored today problem of increasing economic efficiency of the participation of Russian companies in the processing chain becomes actual, because the share of addedvalue, created within these chains, depends on the level, in which involved productive forces of a state are used, andmoreover, from the balance of political forces and impeding economic interests in the global market [4].

Concerning the subjects of such a policy, it is clear that this role does not suit to the administration of regions-subjects of Russian Federation. This is a consequence of the following circumstances. First, the solution of the problems of organization and regulation of activities of the technological chains is carried out in the economic environment, significantly going beyond individual subjects of the Russian Federation. Secondly, the activities of transnational technological chains, crossing the territory of a number of subjects of the Russian Federation, almost not regulated by regional administrations, the economic interests of them often consist in competing with other regions for the federal budget transfers, but not for improving the efficiency of such chains with national economic position.

On the fig. 3 it is presented a conceptual structure of the system of state regulation of a subject (at the federal, regional and local levels), the city Arkhangelsk is in the center, and the object, which activities may take place in different regions of Russia and other countries, and in fact at the local level of government.

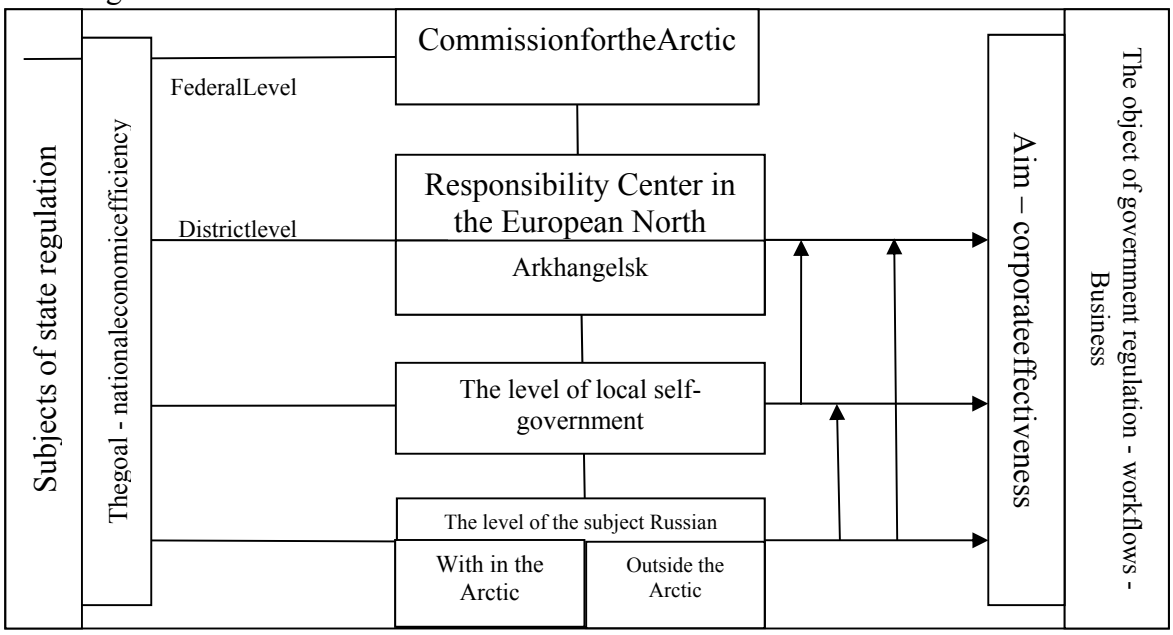

Fig. 3. The concept of the system of state regulation of production chains in the European North of the Arctic Region

For the normal functioning of the system it is required to harmonize the interests of the subjects and objects of state regulation, which are reflected in the scheme in the form of goals. These goals, in most cases, are contradictory, as they reflect the interests and intentions of various government and business entities (State of the Federation, local authorities, businesses). If we define the harmonization of objectives as the achievement of the mutual agreement of all the subjects and objects of state regulation on the basis of consideration of their mutual interests and intentions, in which the goals are clear and accepted by all subjects and objects, do not cause counteraction, perceived by them as their own and all actions are aimed on the realization of common goals, then the harmonization of objectives allows to get the functional balance of interests of subjects and objects, provide the degree of balance with each other, which ultimately allows you to function and develop in this direction. This ensures a stable status of all subjects and objects, overcome possible contradictions in their actions.

Achieved as a result of the harmonization convergence of interests and positions leads to the removal of tension, eliminates inconsistencies and ensure the implementation of major state policy objectives - increasing of national economic efficiency of the technological chains. Thus, the current level of harmonization of intentions and interests of the subjects and objects of the state policy is the main criteria for building its priorities in the regulation of technological chains in the Arctic projects.

RESULTS

On the basis of THE investigations the following conclusions and suggestions can be offered.

1. In general, the effect on the functioning of the technological chains marked by an overwhelming majority of researchers. At the same time, national's economic efficiency depends largely on the number of national participants in global supply chains. Technological chain is formed for tactical goal - to get more profits by its participants, as well as for strategic, such as the implementation of large-scale projects of national economic development, the formation of integrated regional management, the development of the technological chain, which corresponds to the conditions and requirements of the development of the hydrocarbon potential of the Arctic. The government can and should play in shaping of the technological chains different role: from active participant to the subject of the formation of the production (such as transport) infrastructure enabling the establishment of sustainable global supply chains with Russian participation in the state (region) and beyond. We disagree with the views of the authors [10], that government regulation of such chains is disparity, because it does not take into account the interests of the subjects. We believe that the interests of the objects and subjects need to be harmonized, as noted in the report of the OECD, WTO and UNCTAD for the Leaders Summit of G-20 in St. Petersburg, on the consequences of global value chains (2013) [9].

2. As the proposals to change the state regulation of the participation of Russian companies in global chains of the Arctic in the Northwest it is proposed to use the concept of the system of state regulation of production chains in the European North of the Arctic region with the definition of its center. The main purpose of this center is to coordinate the participants of the Arctic projects in North-West - the state, businesses, science and education, in order to harmonize their interests on the criterion of national economic efficiency.

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Qualitative Model of Innovation Ecosystem: Application for Comparative Analysis of Japan and Russia

Anna Kovaleva[90]
Saint-Petersburg State University of Economics

Abstract

This paper concerns the analysis of innovation ecosystem in comparative perspective on example of Japan and Russia. The qualitative model of innovation ecosystem to analyze success and failures of innovations is elaborated. This designed method simultaneously captures two perspectives: external and internal environment as the substructures of innovation ecosystem. Additionally, the proposed model allows us to examine innovations on three levels such as: macro-, meso- and micro-level. The results promise to be of value to significant areas of scientific practice and will also generate recommendations for the public and regulatory bodies.

Key words: innovation ecosystem, barriers of innovations, qualitative model, stakeholder analysis, communication and negotiation, comparative analysis of Japan and Russia.
JEL Classification Numbers: O30, O39, O40, D83, F51, O57.

Introduction

This paper is devoted to analysis of barriers to develop innovations in Russia and Japan in comparative perspective. These countries hold different ranks[91]: Russia is on the transition stage (from stage 2 to stage 3) and Japan presents innovation-driven economy. However innovation environment of both countries is undeveloped notwithstanding having strong potential for efficient performance. In other words, there are barriers for boosting innovations in Russia and Japan. So it can be supposed that capacities of the considered countries are not fully realized but for different reasons. Nevertheless it's necessary to consider not only macrolevel, but also capacities on meso- and micro-level for analysis of cause-effects in developing innovation ecosystem on national level[92]. Moreover there is a problem of intercorrelations between actors and institutions[93].

Thereupon the qualitative model for analysis of barriers to innovations in Japan and Russia is proposed (see pic. 1). This model allows us to capture two perspectives simultaneously: external (as hard components) and internal environment of company (as soft components) of innovation ecosystem. Additionally there is the third group of components (C) as intermediate.

In two blocks of components A and B different stakeholders are described. The third block C as intermediate is presented by subcomponents of innovation ecosystem that impacts on both external and internal environment of innovation ecosystem as substructures.

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[90] PhD in Social Sciences, Associate Professor, Docent of the International Business Department, Saint-Petersburg State University of Economics. E-mail: intermasterf@gmail.com
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[91] According to "The Global Competitiveness Report 2014-2015" (2014) by World Economic Forum, http://www3.weforum.org/docs/WEF_GlobalCompetitivenessReport_2014-15.pdf
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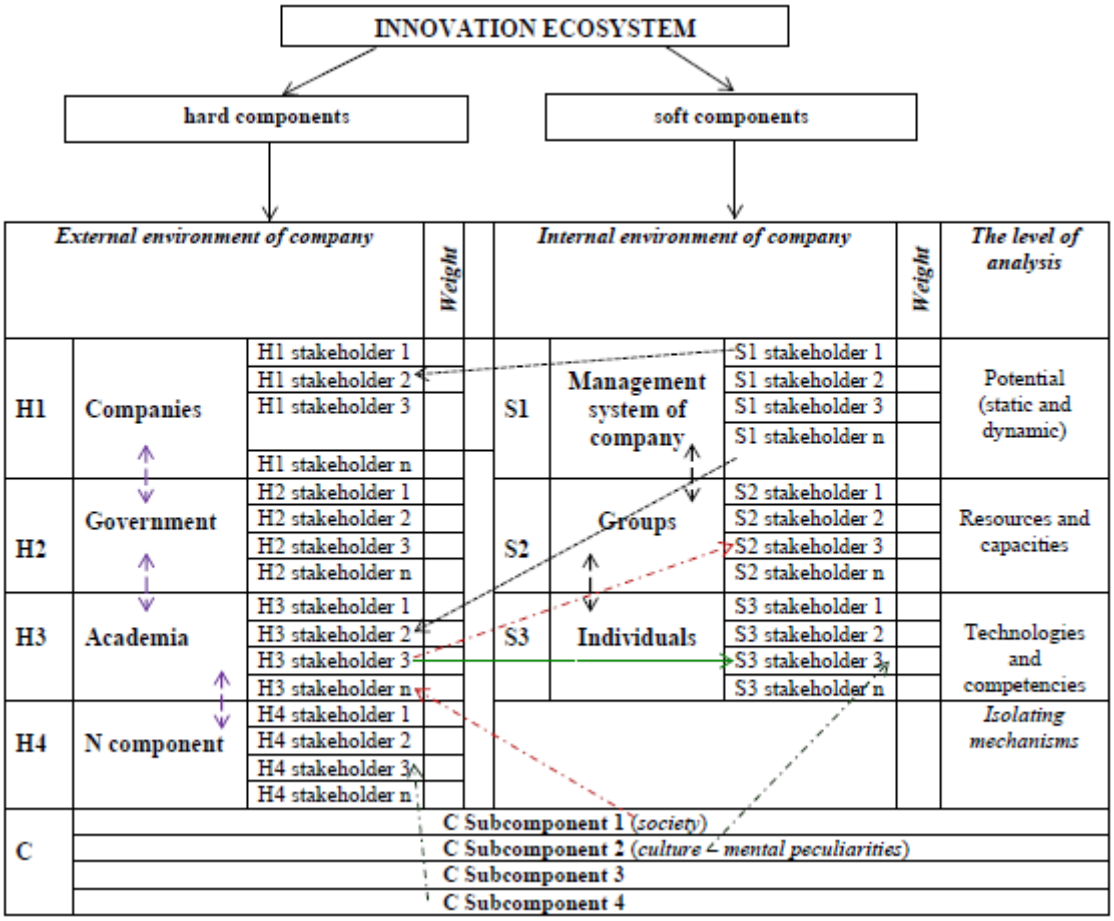
Picture 1 – Qualitative model of innovation ecosystem



The idea is to underline the importance of revealing the key stakeholders as representatives of hard, soft components and subcomponents. The components as companies (market), government, academia and company itself are vague phenomena and if they are considered separately it's not possible to explain failures and successes of innovations on the level of companies, markets or economy. That's why this qualitative model proposes to reveal the main stakeholders in every component and subcomponent, to evaluate their weight in decision making process in communication on innovations with other stakeholders.

Importantly, the list of components, subcomponents and stakeholders can be modified for research purpose. For example, a circle of subcomponents and stakeholders on regional level differ from the national one.

Further the all three groups of components are considered consecutively.

The first group "hard components" (H) refers to external environment of company. This H group consists of main components such as other companies in the market (on local, national or global level), government (government policy on innovation; science and technology policy etc), academia (educational system: schools, colleges, universities, science schools, advanced courses for adults etc). Depending on the focus of analysis, additional components can be added such as venture capitalists, non-government organizations etc.

The next group "soft components" (S) falls into category "internal environment of company". Internal environment of a company is presented by three different levels of analysis founded on the model of analytical structure of resource-based view (elaborated on the framework of Platonov

Vladimir, Karlik Alexander and Eliseeva Irina)[94]. Let's consider this group in more detail. Innovation policy of company is considered as the capability of realization of potential. At the same time this potential consists of two types: static and dynamic. The first one includes resources in operating activities (material and non-material) using technologies (in production and management) and organizational skills and competencies (such as technical and managerial). The dynamic potential of a company in turn is divided into two parts: resources in investment and innovation activities based on technologies (for instance, trainings, R&D) and dynamic skills. Isolating mechanisms allow company to keep their know-how and make her different from other organizations[95].

The last group of subcomponents (C) refers to special types of components that can be embedded simultaneously to both types of environment of company: society, culture, business practices etc. For example, attitude to innovations, entrepreneurship in society impact on external environment of a company and at the same time on will of employees to propose new ideas, to be ready for changes etc.

The abovementioned description defines only static picture of the model of innovation environment and answer to the question "what" is innovation ecosystem of a particular country.

However it's crucial to understand the causes of various level of development of innovations ecosystem in Japan and Russia. In other words, it's necessary to answer to a question "why" innovations are developed differently in these countries. For this reason, the dynamic picture is proposed in the qualitative model.

It was supposed that the external and internal environment of company by itself doesn't guarantee boosting of innovations. The key factor of development of innovations is efficient communication among actors as stakeholders. Negotiations among participants of innovation ecosystem make the components alive and the innovation ecosystem, in the whole. Moreover, communication failures between stakeholders lead to shortcomings in improvement of innovation ecosystem.

The possible ways of communication are marked by arrows on the schema of the qualitative model. The arrows are divided into two categories: one side and two sided arrows that indicate ways of directions of communication such as one- or two-way.

Thus dynamic perspective of the model is focused on disclosing the communication between stakeholders and nature of noises during interaction, identifying their interests, describing process of making decision. Additionally, another important measure is management of these types of tensions for smoothing collaboration.

Furthermore, impact of each stakeholder and subcomponents can be evaluated using a weight basing on primary and secondary data designing analytical scale.

As result, the elaborated qualitative model can be submitted for comparative studies of innovations in different countries and on several levels, for instance, to compare the innovative-driven companies on the level of company or national economy. The main barriers and their weighs can be revealed for the considered countries through the comparative application of the qualitative model for Russia and Japan cases basing on primary and secondary data. Finally, the proposed model permits to obtain the following outcomes:

1) to categorize the components of innovations ecosystem on national level (it can be applicable for regional as well);

2) to identify stakeholders for every block of components and subcomponents;

3) to consider the weighs of every stakeholder within the framework of a component and a subcomponent;

4) to examine the path of communications between stakeholders and reveal types of noises in these interconnections.

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[95] Eliseeva I.I., Platonov V.V. (2014) The Dynamic Potential as the Missing Link in the Research of Innovation, *Finansyi i biznes*, No. 4.

As the result innovation ecosystem appears as dynamic image but not static one.

In the whole, combining primary and secondary data for each case (country, sector of economy etc) allows researches and policy-makers to understand the routes of success and failure of innovations. In short, it can be developed the model of innovation ecosystem for particular cases to increase the level of performance of innovations in practice.

Conclusion

This paper describes the author's qualitative model for understanding the causes of performance of innovation ecosystem on the macro-, meso- and micro level.

However the proposed method has some limitations.

Firstly, a set of components and subcomponents can be varied in every country with incomparable weights. This point can be overcome by reveling the most relevant components in every case and providing a coefficient to make a balance between weighs of (sub)components.

Secondly, the methodological question of measuring of efficiency between stakeholders can be raised. The elaborated author's method permits to capture the whole picture of negotiation without subjective stakeholder's point of view.

So, there are measures to eliminate limitations of implication of this model.

As the result a dynamic model of innovation ecosystem can be designed with pointing out barriers and ways to overcome them in comparative perspective on the example of Japan and Russia in the future studies.

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Characteristics and Prospects of the Way of Work of Russian Workers: In Comparison with Advanced Countries

Hiroaki HAYASHI[96]
College of Economics, Ritsumeikan University

Abstruct
The aim of this paper is to clarify features of the way of work in Russia and prospect future changes in comparison with advanced countries based on economic system analysis. First, we show variety of working hours of various advanced countries. Next, we explain the background of variety of the way of work based on two factors, possibility of upward mobility from non-elite to elite workers through hard work and public social security beyond job related one. Then, as special feature of the way of work of Russian workers, exit behaviour such as informal economic activities is widespread under the circumstances of stable employment and flexible wage. This is based on the gap between formal institutions to protect workers' right effectively and weak law enforcement. Finally, we show some implications based on the comparison of the way of work between advanced countries and Russia.

Keywords: way of work, working hours, work motivation, Russia, upward mobility, public social security
JEL Classification Numbers: J53, J81, P23, P52

1. Introduction

Significant changes have been observed globally in working life since the 1990s, especially in developed countries, with the most noteworthy change being the expansion of irregular employment triggered by the deregulation of the labour market. Behind this are such trends as the adoption of neo-liberal policies aimed at liberalising the labour market, and the development of globalisation. This trend of increasing irregular employment has been observed in many parts of the world to some degree or another; however, each country continues to have unique features of labour and employment. This may be because the institutional arrangements of each country are functioning as a kind of filter, through which the pressure of globalisation is refracted and its direct impact on work and employment is mitigated (Wood and James, 2006). These differences affect physical and mental conditions of workers in each country and cause labour productivity gap of various countries.

The aim of this paper is to clarify features of the way of work in Russia and prospect future changes in comparison with advanced countries. The author wants to know why the way of work of each country is so different and what the relation between the way of work and work motivation is. In so doing, the author presupposes the following two points. The first is that each economic system has its corresponding rules for motivation and incentive and the second is that in order to compare work motivation internationally, it is essential to take into account cultural and social contexts of each country. This paper will address these points by examining the way of work and work motivation based on economic system analysis.

2. Variety of working life in advanced capitalist countries

There is variety of approaches to work in developed capitalist countries. For example, due to an increase in part-time workers and revisions in legislation, the average working hours per person have been in decline; however, the proportion of long time workers (i.e. those who work more than 50 hours a week) has been steady or slightly increasing, resulting in a polarisation. If we look at average working hours in different countries, based on the Organisation for Economic Co-operation and Development (OECD)'s data on average annual hours actually worked per worker (2013), Mexico and Korea are the leading country, with over 2,000 hours. Transition countries such as Russia and

[96] Professor, College of Economics, Ritsumeikan University, Japan (hirohaya@fc.ritsumei.ac.jp)

Poland follow. Within advanced countries working hours of Anglo-Saxon countries such as United States and United Kingdom are far longer than that of continental European countries. Japan is almost at the same level as the United States. As data based on the statistics are different from each country, it is difficult to compare working hours of various countries directly. However, most advanced countries have common data to some extent.

Figure 1 shows changes of average annual working hours of advanced capitalist countries from 1992 to 2013. We can find downward trend of working hours in general. This is because legislation to diminish working hours has been introduced and the proportion of non-standard employment has increased rapidly. In countries such as the United States and Britain, it is said that market principle is strong, regulation on working hours has been traditionally weak, and overtime work is quite common. They are therefore the countries that are facing longer working hours than other developed countries, apart from Japan. In contrast, in Continental European countries like France and Germany, labour-management agreements and labour legislations on working hours are quite strict, with daily working hours kept relatively short.

Working hours of Japan has diminished greatly since 1992. Behind this decrease we can find increase in the share of non-regular workers (35.2% in 2011). In case we take into consideration only full-time workers, their total would be more than 2,000 hours (see figure 2). In addition, the proportion of workers who work more than 50 hours a week is greatest in Japan (31.7%), as mentioned, followed by Korea (27.66%), Great Britain (12.06%), the United States (11.13%), France (8.96%), Germany (5.41%), Denmark (1.97%), the Netherlands (1.97%), according to OECD Better Life Index. When taking into account the extent of the introduction of the five-day work week system, and normalisation of unpaid overtime work, the Japanese way of work is peculiar among the developed countries.

In this way we can classify three types of the way of work in advanced capitalist countries, Anglo-Saxon type, continental European type and Japanese type.

3. Background of variety of the way of work

Why do Japanese workers work so long? Kumazawa (2010) argues that there are some features which are commonly observed in the corporate community of Japan, and they are the factors encouraging workers to adapt by overworking, and consequently causing death and suicide. These features include: long working hours necessitated by heavy quota and responsibility; ambiguity of working hours management and the normalisation of unpaid overtime work; workers are 'forced to be voluntary' to some extent or another and cannot help but 'work hard' to adapt; corporates' reaction that they do not force or order long working hours and the overtime work is primarily voluntary when death or suicide do happen; oppressive attitude of boss and the absence of the sense of solidarity in work place while merit system pervades; low proportion of base pay to income. Furthermore, it became foreseeable in the 1980s, 'the age of consumption', that if one tries hard, the life of middle-class is in fact achievable. As merit and performance based pay system pervades, 'individualisation' of work condition and corporate culture of competition and selection have spread. Such an environment led workers to determine they have no choice but work hard in order to survive, and this strengthened the above features. Another factor which contributes to these tendencies is the absence of the generally accepted image of lifestyle according to social stratification in Japanese culture.

Based on Kumazawa two factors can be drawn out to judge if workers accept hard work in terms of compulsion and voluntariness. First, relationship between elite and non-elite workers based on social class and type of job, that is the extent of possibility of upward mobility from the latter to the former through hard work. Secondly, characteristics of welfare state, namely the extent of universal public social security system beyond job related security. Let us examine background factors which give rise to the difference of the way of work between Anglo-Saxon countries, continental European countries and Japan. First factor is the way of determining wage and promotion; second one is role of public social security system.

As far as wage and promotion is concerned, the way of work in Anglo-Saxon model is based on market mechanism. Wages are generally based on job evaluation, with quite large difference between white and blue collar workers. While white collar workers are evaluated personally based on

performance in addition to job evaluation, wages of blue collar workers are generally determined based on job evaluation and wages would rise uniformly or by seniority based on the role of trade union. In continental European countries strong public regulation to work is distinctive and rights of the workers are relatively well protected. Wages are generally based on job evaluation. Collective bargaining and codetermination are quite popular based on strong power of trade union. However, wages do not increase rapidly especially for blue collar workers. Blue collar and white collar workers are separated as different social classes based on different education system etc. Japanese way of work can be explained in terms of Japanese employment system, i.e. employment and wage rules. Hamaguchi (2009) sees the essence of Japanese employment system in the nature of employment contract. In Europe and the United States, employment contract is signed, agreeing on workers' job duties. However, in Japanese employment system the conception of job duties is not weighed heavily. In employment contract itself, concrete job duties are not specified. Therefore, employment contract is often called 'tabula rasa' on which job duties are written as they emerge. Its legal character may be considered, according to Hamaguchi, as a kind of a contract for ensuring a position or membership. The elements generally regarded as the features of Japanese employment system, such as long-term employment system, seniority system, and in-house union are the logical consequences of the nature of this employment contract without job duties specification. Seniority system is particularly so, since in Japan wage and job duties are separated and the duration of service is considered to be the primary criterion in determining wage, while this is supplemented by personnel assessment which take into account various factors. Pay is in a sense a reward for the membership of a company, and salary system is applied to production-line workers, too. Blue-collar workers are also subject to personnel assessment, and in addition to objective factors, such subjective factors as eagerness and effort toward their duties are taken into account as important elements. In this sense, workers are required to be loyal to their company as its members. This means that not only white-collar workers, but also blue-collar workers can hope for pay rise and promotion, thus get involved in a promotion race[97]. At the same time, this system applies only to regular workers, and irregular workers without membership of the company, as well as female workers with quasi-membership, are placed outside or in the periphery of Japanese employment system. It may be considered that it is under this Japanese employment system that Japanese workers have accepted long working hour and regular unpaid overtime work (Takahashi 2005). Furthermore, neither trade unions nor the government has strong power against working condition forced by Japanese employment system.

In this way, differences in the way of determining wage and other working conditions could be classified in terms of two criteria, individual or collective bargaining and firm, industry, or country level bargaining (see Ishida 2009). As shown in figure 3, coordinated market economies such as Germany are characterised by collective and industry level bargaining. Although often regarded as coordinated market economy, Japan is characterised by individual and firm level bargaining in the way of determining wage and working conditions. Germany and Japan are located in the opposite extreme. Liberal market economies such as USA are in the intermediate position. While all countries have moved towards decentralisation and individualisation, difference between countries still remain.

Next, we have a look at the second point, namely difference of public social security system (see figure 4 and 5). In Anglo-Saxon countries where market principle is strong, employment security is limited and social security expenditure is often small in amount. In the United States in particular, legislation for employment security is weak and not much budget is allocated to active labour market policies. The scale of social security is limited, and the expenditure is concentrated on the poor whose income is below the designated level. Since employment security is weak, long-term unemployed people and single parent household without wage-earner have increased, and they came to be deeply dependent on such social security for the poor. As the gap between the rich and the poor widens, work motivation, too, may be polarised. In Continental Europe, such as Germany, spending on social security has been large in general, yet pension occupies a large portion of this. Therefore, employment

[97] Ishida (2004) compares upward mobility of blue collar workers of USA, Germany and Japan and demonstrates that possibility of upward mobility of Japanese workers is highest.

security for working generations has been weak. Social security as a whole has not contributed to the expansion of employment opportunities, and concrete measures to expand employment opportunities have also been feeble. As for legislation for employment protection, regulations against layoff as regard to individual employee and employer have been severe in general, and labour market lacks mobility. In addition, since the financial burden for social security has been heavy for employers, they are reluctant to expand employment and tend to encourage early retirement of workers. In Japan, employment security is quite limited and social security expenditure is small in amount[98]. This situation is quite similar to that in Anglo-Saxon model. In addition, restricted amount of social security concentrates on the latter part of life (as pension and the healthcare for the elderly). This indicates that working generation, whether they are white-collar workers or whether they are blue-collar workers, have no choice but to long and hard work.

Based on the above comparison of the way of work in advanced capitalist countries, let us turn to the way of work in Russia which has transformed from socialism to capitalism and clarify characteristics and background of the way of work.

4. Characteristics of the way of work of Russian workers and its background

Prior to its recent transformation, labour management in the socialist USSR was uniformly controlled by the state in order to distribute and control labour. Such a system was characterised by the high labour force participation rate and virtual absence of unemployment. Companies were able to employ more workers than necessary for production, through 'soft' budget constraint, and employment was forced by the government. This partly led to lower labour productivity in USSR. On the other hand, workers were relatively satisfied with their work, since they received various social services from their employers in addition to fixed salary, and they were able to move companies if they were unhappy with their employers.

After the transition, labour management system based on government control and order was abolished and replaced by market mechanism. The creation of private companies and additional employment opportunities is now allowed and, in contrast to the socialist era, workers are now able to choose their work place and occupation. At the same time, there have been various problems with the new system, such as an increase in unemployment and delay and failure of wage payment. Under these situations, workers came to view their work simply as means of making money (Ryvkina, 2004).

Due to the economic development that has occurred since 1999, there have been fewer delays and failures in wage payment, and the country's overall income level has improved. In 2012, annual working hours in Russia totalled 1,982 hours, which is above the OECD average (1,765 hours) and slightly above its 2011 OECD hours of 1,979. According to Rosstat (Russian Federation Federal State Statistical Service) data annual working hours totalled 1,946 hours in 2012 which contained 1,853 hours for main work and 93 hours for side businesses. However, the proportion of workers who work more than 50 hours a week is 0.16%, which is considerably lower than the 8.76% average in the OECD Better Life Index. Those who work longer hours in Russia are primarily entrepreneurs and self-employed workers, and there has been an increase in the proportion of irregular workers, comprising about 15% of the working population in 2007. The principle of equal pay for equal jobs has been widespread (as defined in Article 22 of Labour Law), and the wage discrepancy per hour is not significant. The unemployment rate in Russia was 5.5% in 2012, but those unemployed for more than a year is only 2.2%, which is below the OECD average of 3.1%.

As for the policies and legislations regarding employment and work, the rights of workers are relatively well-protected in Russia, given the strength of employment protection (e.g. in order to layoff surplus workers, employers must inform workers and trade unions two months in advance, and then pay two months' worth of wage as a discharge allowance), and that employers cannot limit the employment period of workers when hiring them.

[98] Though not appeared in Figure 4, the share of public social expenditures in Japan against GDP is 22 percent. This is the smallest in advanced countries after the USA.

We have a look at the way of work in Russia in reality based on Gimpelson and Kapeliushnikov (2011). The determination of wage in Russia is based on very rigid corporatist arrangement inherited from the Soviet past. The wage setting seems to be highly centralized and coordinated. Firms would seem to be completely constrained in their wage policy. However, a considerable fraction of total wage payment is variable and not fixed in labour contracts. This part includes premiums and bonuses. Over one third of the total wage is not contracted at all and remains contingent upon performance. That is why wage could be fluctuated remarkably. During these 20 years against GDP fluctuations stable employment and low unemployment could be seen. Adjustment has been made by fluctuations of wage and working hours. In addition, the minimum wage was fixed at a low level and was hardly binding for the majority of firms in the economy. The extent of unemployment benefits is decided based on the highest monthly average wage designated by law, and this is quite small compared with the country's average wage. As far as unemployment benefit is concerned, total spending on passive and active labour market policies remained remarkably low. Unemployment benefit level was unable to act as an effective wage floor. Moreover, trade union is extremely weak in Russia. Trade union initiatives are easily blocked by the government and are accepted only if the government agrees.

Between the employer and workers in a company, workers are relatively satisfied with the relationship, which has a direct correlation to workers' satisfaction in their relationships with colleagues (Temnitskii, 2004). According to Radaef (2009), in many Russian companies, workers and the employer share a mutual interest, and a paternalistic relationship can be observed between them. On the other hand, Anikin (2009) insisted that Russian workers are not interested in autonomy at work, resulting in a low overall level of autonomy within Russian companies, especially in the practice of labour discipline.

What factors, then, are behind such a way of working in Russia? A key feature of the Russian wage and employment system is an emphasis on maintaining employment. According to Gimpelson and Kapelyushnikov (2007), the distinctive characteristics of the Russian labour market can be seen as its combination of stable employment and flexible wages. In general, developed capitalist countries' wage resiliency is low and it is employment rather than wages that decrease in a recession, causing an increase in unemployment. In the Russian labour market, however, the adjustment in times of recession will be reflected in a wage reduction, rather than a change in employment reliability. This mechanism of adjustment in the labour market is a distinctive model enabled by the combination of Russian institutions (e.g. strict employment protection, low minimum wage, weak enforcement) in a mutually complementary manner.

Emphasis on maintaining employment can also be observed in the behavioural pattern of companies. Companies' means for reducing labour costs include layoffs, shortening of working hours, and adjustment of wages. Russian companies tend to prioritise adjustment of wage and shortening of working hours, considering layoffs as a means of last resort. In addition, a unique characteristic of Russian companies is that they may eliminate a whole or part of a bonus, or delay payment (Kapelyushnikov and Gimpelson, 2009). This employment system and corporate behaviour suggests that, in Russia, an emphasis is placed more on enabling workers to retain employment rather than on a fluctuation of wages.

In addition, in order to see possibility of social upward mobility in Russia, wage difference between white collar and blue collar workers has to be examined. The figure below shows average wages of various segments of workers by age. Relatively flat wage curve can be seen except for managers. Peak of the amount of wage is 30-34 years and continuous service does not enhance the amount of wage. This wage system does not increase motivation of workers to work hard for the firms that they belong, regardless of white collar or blue collar workers. This also means that the possibility of social upward mobility through work is not high in Russia.

Finally, let us confirm the level of public social security. As shown in figure 4 share of public social expenditure of GDP is lower than that of Japan or USA, to say nothing of continental European countries.

In this way Russian workers cannot rely heavily on wages from the firms that they belong and public social security. That is why they seek fringe benefit from their firms and opt for survival

strategy. Russian workers are responding to the reduction or non-payment of wage by taking advantage of, for example, free medical care and education, self-produced food and products, network of relatives and friends for mutual help, second job (which is allowed by Labour Law) and informal economic activities (Hayashi 2011). This suggests that the life of Russian workers is not heavily dependent on their companies. This means that, contrary to long working hours, work intensity might not be very strong.

How can such features of work in Russia be evaluated in relation to work motivation? First, it may be considered that placing emphasis on the stability of employment serves as a buffer against the shock of great social changes, such as an economic crisis (Hayashi, 2011). Conversely, since people need to supplement relatively low and highly fluctuating wages through various means, workers move from one workplace to another in pursuit of better income, while also reaching for unofficial income (e.g. a second job or 'hidden employment'). It is assumed that this has led to a reduction in work motivation. This is ingrained into Russian workers' consciousness, as well. According to a survey by Levada Centre in 2000 and 2010[99], Russian people considered a high wage as significantly more important than other factors when deciding to accept a job. At the same time, Russian workers compensate for their low level of satisfaction, mainly with wage, with their high satisfaction as regard to internal factors of work, particularly with the inter-personal relations in workplace. This suggests that in Russia, workers' motivation is strongly influenced by not only wage but also inter-personal relations with their bosses and colleagues.

Moreover, according to Kapelyushnikov et al. (2012), the maintenance of employment through the Russian-style labour market adjustment, and consequent lowering of wage, make official institutions and rules for employment (e.g. employment contract) unofficial, which in turn leads to a delay in the restructuring of employment as well as inefficient management, lower incentives for investment in human resources, and lower labour productivity. This method of adjustment has played a positive role in mitigating the impact of great changes, but it has also caused problems by undermining the institutions within the market as well as human resources in general.

5. Implications based on comparison between Russia and advanced countries

Finally, we show some implications based on comparison between Russia and advanced countries.

Firstly, each economic system has its corresponding model of the way of work and work motivation, and each has its own advantages and disadvantages. Every variant used to function well and contribute to improve labour productivity, but in recent years the relation between the way of work and work motivation has been dysfunctional in many countries. All variants are in need of restructuring under globalisation, yet they have not been converged into a particular variant. As shown in Figure 3, while all countries have moved towards decentralisation and individualisation, difference between countries still remain. Figure 7 includes USSR and Russia. In that official wage and other working conditions were determined uniformly across the whole country, the way of determining working conditions in the USSR was most centralised and collective. Russia inherited most of these features from the USSR. On the contrary, informal provision of bonus or firm original benefit through human relations between managers and workers has been widespread since Soviet times. In this respect position of Russia in the figure might be thought to be quite similar to that of Japan. Russian workers make a great effort on informal economic activities such as second jobs in order to supplement the gap between formal and informal institutions.

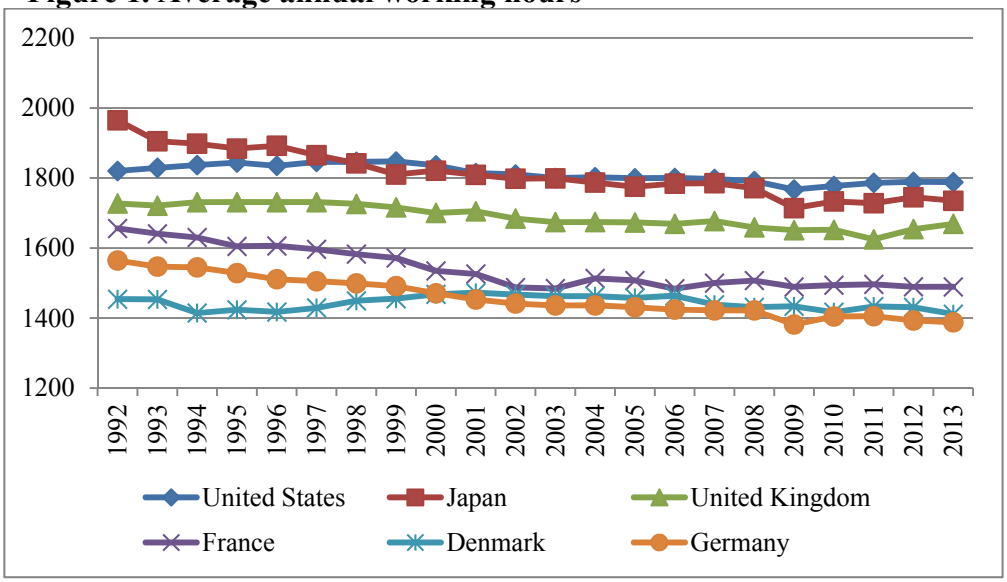
Secondly, it ought to be noted that law enforcement is quite weak in regard to the way of work in both Russia and Japan. In Russia, weak law enforcement is the cause of flexible wages, while in Japan, unpaid overtime work is widespread. These characteristics differ from employment systems in Europe and the United States. It might be possible to classify the way of work of various countries based on the effectiveness of enforcement. The table below is a simple typology of labour markets by Gimpelson et al. (2009). Through a mixture of formal stringency of employment protection legislation

[99] http://www.levada.ru/archive/otsenki-sotsialnykh-problem-i-zanyatosti/esli-vy-seichas-ustraivalis-na-rabotu-chto-dlya-vas (accessed 22nd Feb 2014)

(EPL) rules and effectiveness of EPL enforcement, four classification divisions emerge, which include three types of capitalism: Continental Europe; Anglo-Saxon countries; and Russia, CIS, and Brazil. It might be possible to insert Japan in the fourth division, which is blank. We need to refine this typology as a first step to classifying the way of work and work motivation in various countries.

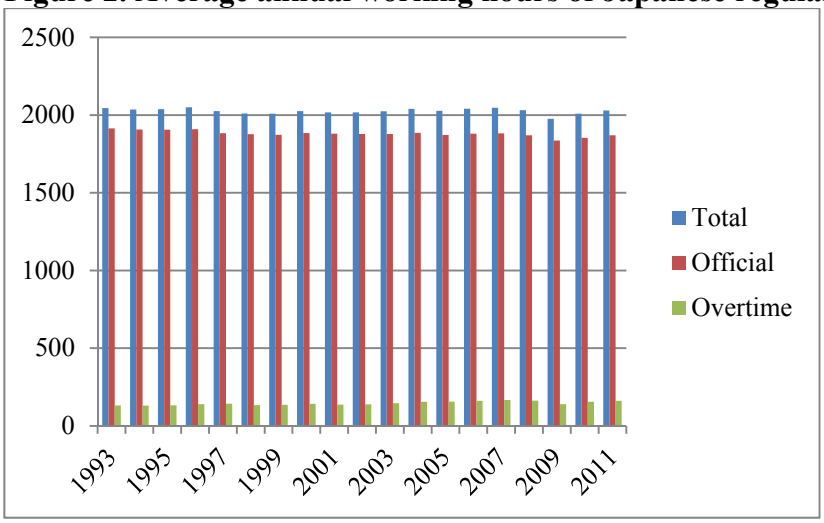
Finally, way of work is rooted in history of each country and value of workers. It might not be easy to change. For example, in Anglo-Saxon countries differentiation by ability is admitted and social mobility through hard work is regarded as important especially for white-collar workers. In continental European countries participation to decision making is attached greater importance. Moreover, many people regard leisure time much more important than work time. In Japan exertion is more important than performance for workers to be evaluated. And the generally accepted image of life-style according to social stratification cannot be seen. In Russia people make much of equality on employment, not the amount of wage. We need to examine in more detail how value of workers in each country is tied up institutions around work and influence the way of work and work motivation in each country.

Figure 1. Average annual working hours



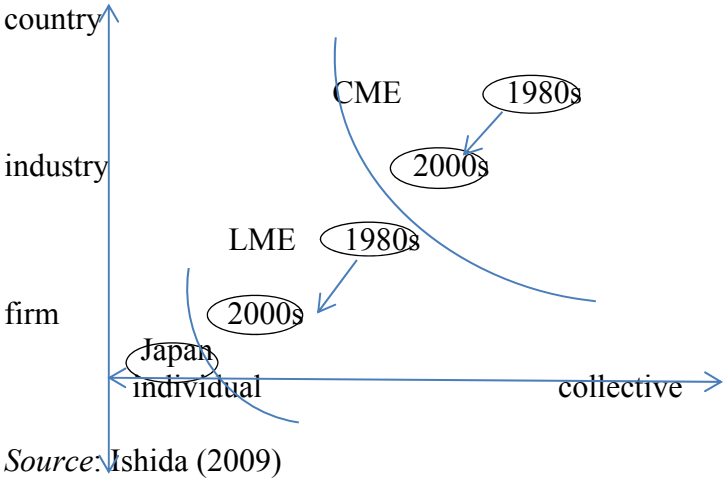
Source: OECD database

Figure 2. Average annual working hours of Japanese regular workers



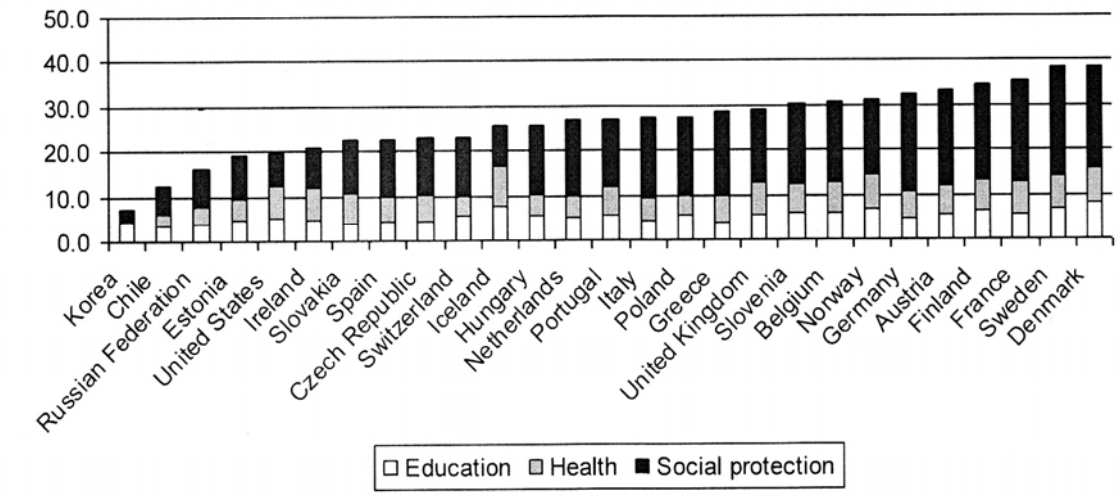
Source: Ogura (2013) p.228.

Figure 3. Classification of the way of determining wage and working conditions



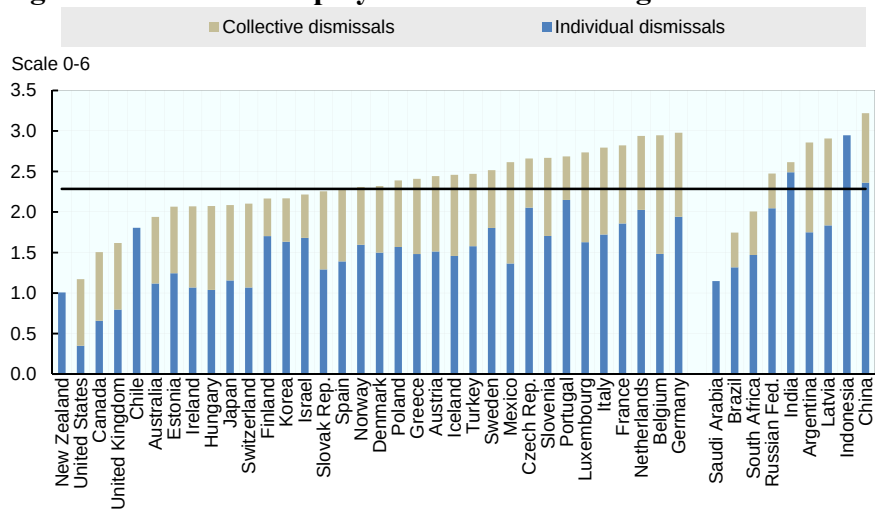
Source: Ishida (2009)

Figure 4. Public Social Expenditures as Share of GDP across Countries



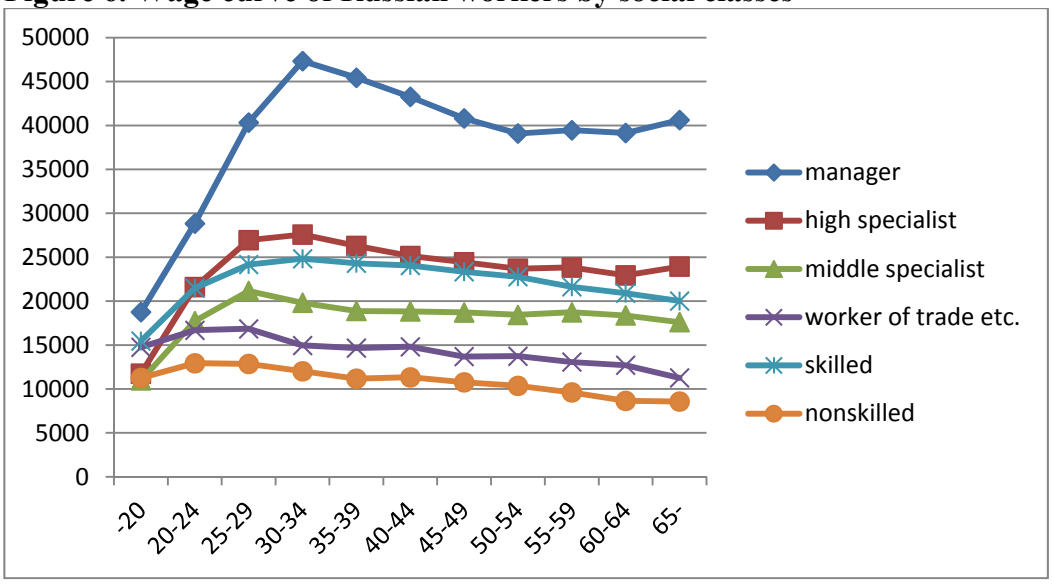
Source: World Bank (2011), p. 16.

Figure 5. Extent of Employment Protection Legislation



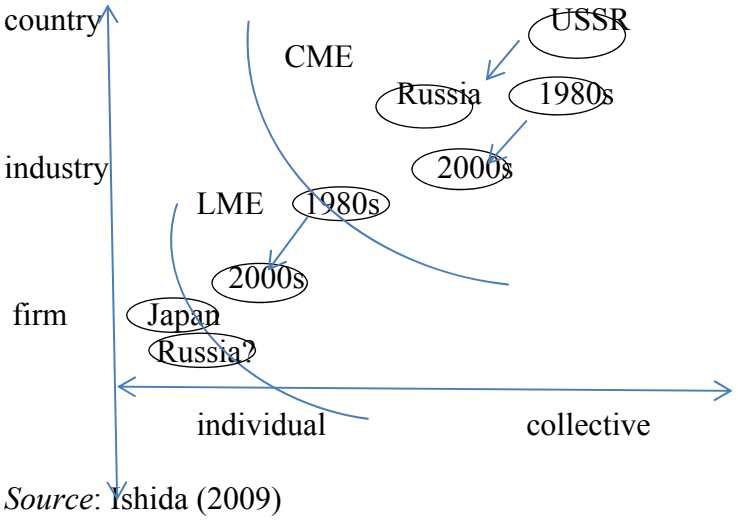
Source: OECD Employment Protection Database, 2013 (www.oecd.org/employment/protection).

Figure 6. Wage curve of Russian workers by social classes



Source: Rosstat (2013)

Figure 7. Classification of the way of determining wage and working conditions



Source: Ishida (2009)

Table 1. The Simple Typology of Labour Markets

		Effectiveness of EPL enforcement	
		High	Low
Formal stringency of EPL rules	High	1. Continental Europe	2. Russia, CIS, Brazil…
	Low	3. Anglo-Saxon countries	4.

Source: Gimpelson et al. (2009), p. 8.

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