

The Macrotheme Review

A multidisciplinary journal of global macro trends

Research of modern forms of communication between business and universities in Russia

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Abstract

The main modern trends of higher education include a strengthening of links between universities and business. In the Russian practice the collaboration between universities and business is shown in two ways. First, the state incentives for such partnerships through federal target programs, the establishment of technological platforms, conduction of competitions, public funding of projects. Another area of partnership is the initiative involvement of business in the functioning of universities in the context of socio-oriented business. The aim of this study is an attempt to generalize the Russian experience and systematize the tendencies in establishing, developing and improving the communications between universities and the business community and, on this basis, to determine the place of Russian universities in the system of this interaction.

Keywords: communication, universities-business, cooperation, collaboration

1. Introduction

Currently, many countries have a tendency for increased cooperation between universities and the business community. In the face of rising global competition, dynamic technological changes in the economy the governments of various countries activate the initiatives support for the establishment of various forms and methods of interaction of universities, science and business. It is obvious that cooperation is seen as a means to improve competitiveness, efficiency of economic development of countries, increase of the potential benefits for all the stakeholders, as it contributes to increasing the access to knowledge and technologies, search for additional sources of funding, both private and public.

Within these processes the problems of interaction of universities and business, specific for both foreign and Russian practice have been defined. The main problems among them are the following:

- better usage of university research and advanced development financed by state, development of universities' intellectual property management, creation of the new forms of the knowledge transfer to the real sector of the economy;

- new curricula and the whole system of higher education should be labor market oriented;
- mobility (international and between business and universities) through involving employees of scientific and educational organizations in developing network collaboration with business;
- establishing legislative background on all execution levels for effective collaboration of universities and business, changing legislation and cooperation stimulation mechanisms.

Russian Federation has accumulated a certain experience of collaboration between business and universities, but there are some unsolved problems. In the present time Russian universities search the ways to effectively build and actualize connections between science and industry in the field of interaction of university institution, the real sector of economy and academic science. The programs of universities strategic development put an emphasis on scientific research and innovative part of their activities. Growth of the communication between companies and universities also acts as a basis of building a mechanism of predicting the companies' needs in the specific training area, which would allow training of specialists considering those needs and companies development regularities.

The aim of this research is to generalize the Russian experience and to systematize trends in establishing, developing and improving communication between business community and universities and therefore determine the place of Russian universities in the system of this communication.

2. Literature Review

Different aspects of communication between higher education institutions and business is the focus of attention of many countries. The evolution of the relationship between business and universities, both formal and informal transaction mechanisms of the transfer of technologies by the universities, the factors affecting the university technology transfer mechanisms are presented in the work by Janet Bercovitz, Maryann Feldmann (2006).

A number of studies is devoted to the analysis of the experiences of various countries in the development of the relationship between business and universities, development of various forms of these relationships, channel of knowledge and technology transfer between universities and businesses (Kazuyuki Motohashi (2005), Rudi Bekkersa, Isabel Maria Bodas Freitas (2008), JPC Marquesa, JMG Caraca, H. Diz (2006)). Specifically, the report of R. Lambert (2003) investigated the relationship of the UK universities and businesses with the assessment of the effectiveness of this interaction, the nature of the impact of these relations on the development of business, universities and population, the recommendations to improve these relationships.

An important area is the research of the role of universities in shaping the innovation system of the country and the variety of spheres of influence of universities on the development in the innovation economy (David C. Mowery and Bhaven N. Sampat (2006), The Group of Eight (2011)).

Materials of The 1994 Group report (2010) point up the coordination of business and universities in research and advanced development field, present positive examples of such coordination and

formulate recommendations for business, universities and government. Professor Sir Tim Wilson DL (2012) in his work presents a detailed program of Great Britain universities and business collaboration providing, which in many ways correlates with the Commission of the European communities program.

The separate aspect of the study is to examine the various mechanisms of mediation between universities and businesses that promote the transfer of knowledge by the universities (Shahid Yusuf (2008)). The researchers examine the barriers to cooperation between universities and business, and mechanisms to reduce these barriers (Johan Bruneel, Pablo D'Este, Ammon Salter (2010)). They analyze the problems of concept formation of entrepreneurial universities (Kevin Philpotta, Lawrence Dooley, Caroline O'Reilly, Gary Lupton (2011)).

3. Methods: data collection

This study combines the results of the review of the published literature in the field of cooperation between universities and business, analytical information from case studies, relevant statistical information on the research topic.

To achieve the objectives of the present study (assessment of the Russian experience of universities and business cooperation), we mainly used the secondary data. While collecting data we used bibliographic data, database of study of universities interaction, science and business environment, including reports and reviews of statistical services. Additional secondary data were collected through analytical processing of legislative and other legal acts and informational materials published by the governmental and commercial organizations. The resulting information is analyzed to identify common problems of cooperation between universities and business, the factors influencing this interaction, determining the actual forms of cooperation and conditions of their operation, with particular attention was paid to the usage of reliable information.

4. Communication between business and universities in Russia: main issues

The results of the Russian experience evaluation shows that to date the key forms of cooperation in two areas have been formed - in the field of human resources development (joint development of educational programs, targeted training of students, additional education of the companies' employees in the universities, practical training and internship of students and lecturers on the companies enterprises and other) and in the area of development of research activities (establishment of joint laboratories and basic chairs with the participation of experts from the real economy sector, the use of university research infrastructure, conduction of joint research, development and experimental works and projects, establishment of small innovative businesses with the introduction of university R&D, etc.). The development of cooperation between universities and business reveals two characteristic directions. First, stimulation by the state of the partnership through the federal target programs (FTP), the creation of technological platforms, conduction of competitions, public funding of research projects. Second, the innovative involvement of business in the functioning of universities in the context of socio-oriented business.

The key legislative and institutional initiatives of the state in the field of forming a partnership between the universities and business are the following:

- Federal Target Programs (FTP), aimed at financing the various areas of cooperation between higher education institutions and businesses;
- Support from the federal budget - 57 innovative educational programs of the Russian universities (2006-2008) for modernization of the educational process, laboratories, purchase of unique equipment, retraining of teachers in the areas of training, demanded by the labor market. Experience in implementing the innovative educational programs of universities became the basis for the competitive selection of national research universities in 2009;
- Formation on a competitive basis of two new institutional forms of organization of scientific and educational activities - National Research University (NRU) and the Federal University (FU). Distinctive features of NRU are the ability both to generate knowledge and to ensure effective transfer of technology in the economy, carrying out a wide range of fundamental and applied researches, the presence of a highly efficient system of the Master students and highly qualified personnel training, advanced system of retraining programs and professional advancement. Currently on the territory of country there are 29 NRUs that impose on themselves the main load in the personnel and scientific support of the requests of high-tech sector in the Russian economy, operates as the supporting universities for the large state-owned companies for research and development in the "value chain". The state support includes both budget allocation and assistance in addressing land and property issues, as well as issues of formation of transport and social infrastructure related to the establishment and development of the NRU.

The purpose of the FU is the development of higher education system based on the optimization of regional educational institutions and strengthening relationships between the higher educational institutions and the economics and social sphere of the federal districts. Currently in Russia there are 9 federal universities;

- Legislative and financial support of the cooperation of universities and organizations implementing the complex projects for high-tech production, the development of innovation infrastructure of universities and attracting the world's leading scientists. The budget allocations are directed to different objects of innovative infrastructure (business incubators, science parks, innovation and technology centers, engineering centers, technology transfer centers, etc.), the legal protection of intellectual property of the university; training and retraining of employees of educational institutions in the field of innovation entrepreneurship and technology transfer, consulting services of the foreign and Russian experts in the field of technology transfer, the establishment and development of small innovative companies;
- Legislative support for the establishment of small innovative enterprises in the universities for commercialization of research and development projects that allowed to establish more than 500 such enterprises;
- Development of legal and institutional mechanisms for registration of technological platforms that serve as the main platforms for communication of educational, industrial and scientific sectors of the economy;
- Preparation of the programs for innovative development of the companies with state participation, including involving the cooperation of these companies with the Russian universities in the execution of corporate R&D plans;

- Providing good legal framework for the development of the initiatives of universities, businesses and other stakeholders in the field of science and technology on the basis of the Russian Federation State Program "Development of science and technologies".

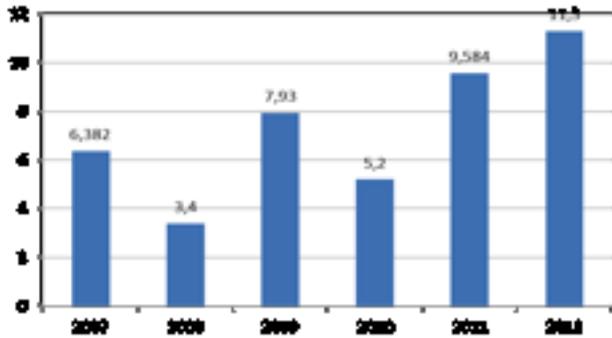
At the present stage the FTPs are represented by two major programs "Research and development in priority areas of scientific-technological complex development of Russia for 2007-2013", prolonged the period from 2014 to 2020 [22] and "Scientific and scientific-pedagogical personnel of innovative Russia" [23].

The first one focuses on the development of scientific and technological potential of the Russian Federation in the purposes of implementation of priority directions of science and technology development in the Russian Federation. The researchers assumed consolidation and concentration of resources in the promising scientific and technological areas on the basis of the increased use of public-private partnerships mechanisms, including orders by private business and innovation-active companies for the research and construction and development works. Among the tasks of the FTPs are provision of the influx of young professionals to the field of research and development, the development of leading scientific schools, the development of research activities in higher education institutions, the development of a scientific instrument base in competitive scientific organizations conducting the basic and applied researches, as well as higher education institutions, the development of effective infrastructure elements of the innovation system.

The main results of the program of 2007-2013 are the fact that in 2007-2012 it was signed more than 4,500 contracts, the amount of additional manufacturing of new products on the basis of the established technologies within the execution of public contracts has been increased by 6 times, the number of employment positions for the qualified scientific and pedagogical staff has increased by 3.5 times. Attraction of the private funding allowed to orient scientific works to the needs of the market and to increase the number of competitive technologies for further commercialization of the results of scientific and technological activities by five times. During the same years, it was published 22 500 scientific articles, executed and obtained 2250 patents and patent applications, developed 274 new technologies [15].

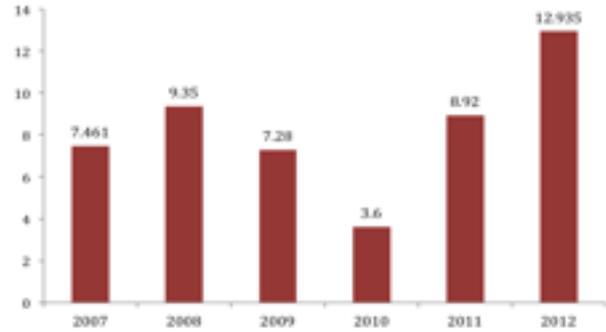
Activization of the main participants of the competitions – "Research and development" of the FTP system resulted in significant growth of young specialists involved in research and projects development, from 6382 in 2007 to 11300 in 2012. Human capacity increase was +77% (Figure 1) and increase in attracted extra-budgetary funds was +73% (Figure 2).

Figure 1: Changes in the number of young specialists involved in research and development projects within the framework of “Research and development” FTP, thousands



Source: Author’s calculation based on <http://fcpk.ru>

Figure 2: Change in the amount of attracted extra-budgetary funds within the “Research and development” FTP framework, billion rubles



Source: Author’s calculation based on <http://fcpir.ru>

In modern Russia there are several collaborate projects with public-private partnership to improve personnel development of the real sector of economy, including in particular the Federal program of training managers for the organization of national economy of Russian Federation implemented from 1998 and the Presidential program for engineering staff advanced training for 2012-2014 period.

The Presidential program of training managers for the organization of national economy of Russian Federation is a large-scale and in many ways unique program. The strategic aim of the presidential program is quality improvement of management on native enterprises to the international level, the specialists training is conducted in 102 universities almost in all regions of the Russian Federation. The program financing is combined from 3 sources – 33% comes from federal budget, 33% from regional budget and 34% is funded either by the enterprise that recommends the specialist or the specialist himself. During 15 years of program implementation more than 73000 specialists of different sectors of the Russian economy already took the training, more than 13000 specialists took internship on foreign enterprises, more than 350 foreign managers took internship on the Russian enterprises [16]. Every year the graduates of the presidential program establish 400-450 new enterprises, 5000 to 10000 new employment positions, the investments, including foreign, are being attracted, collaborate enterprises in partnership with the foreign partners are being established (up to 80 collaborate projects per year), i.e. the mean economic effect of the program is more than 4,0 billion rubles a year (more than 130 thousands USD) [16].

Presidential program of advanced training of engineering staff for 2012-2014 period is aimed at the quality improvement of specialists in engineering and technical industries that are strategically important for the Russian economic development and improvement of engineering training structure within the framework of strategical partnership of the Russian educational

institutions with enterprises and organizations of the real sector of the economy. The program has a mechanism of double-sided funding: federal budget allotments and funds of enterprises and organizations of the real sector of economy that send their employees to training and internships (not less than 50% of federal budget expenses). The total amount of state subsidies allotted on education on advanced training and internship programs for specialists of Russian enterprises in priority sectors of economy is 750 million rubles, including 200 million rubles in 2012, 250 million rubles in 2013 and 200 million rubles in 2014.

The program of year 2012 has been implemented, and this allows making several estimations [17]:

- 5209 technical and engineering specialists took training;
- 1255 people are going to take internship within the territory of Russia;
- 472 people are going to take internship abroad;
- 97,9% of subsidies have been developed;
- 492 enterprises took part in the program as the business parties;
- 330 specialists of partner enterprises took part in implementing advanced training programs as instructors.

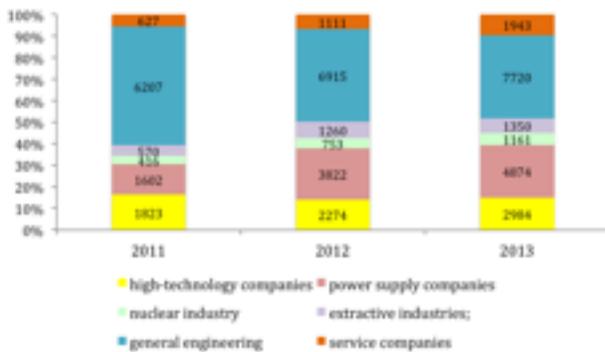
Thus, the implementation of two presidential programs of advanced training is targeted on building up cooperation between universities and business through public-private partnership, involvement of business in building academic programs in accordance with its needs and funding educational processes.

Modern universities are not only the educational organizations, but are also big research centers whose researches are connected to implementational enterprises and big business. World Economic Forum in its every year estimation of competitive ability level «The Global Competitiveness Report» includes the «University-industry research collaboration» index in the estimation of the innovation rate of national economy. Analysis of the RF position dynamics shows the come-down of the rate from 45 in 2002-2003 to 85 in 2012-2013 rating. It should be noted that the index change was insignificant (within 3,3-3,8 limits) [12]. This may tell that positively the “Universities-business” relations level does not undergo significant changes in Russia, and the positive dynamics in other countries leads to the relative come-down of the country’s rate on this index.

Improvement of communication between the Russian universities and companies in the field of research and advanced development will be supported by the government measures for development of public-private partnership, specifically, the programs of innovative development of the state companies or the companies with the leading state participation assuming the active cooperations between the companies and scientific organizations and higher educational institutions. The cooperation is planned both in scientific and research and educational areas.

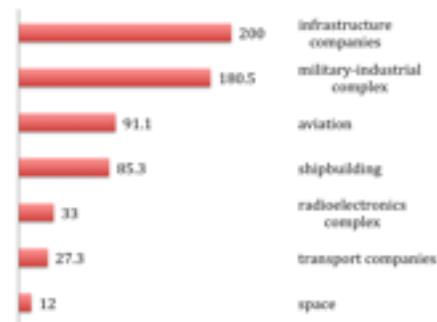
According to the Government Commission for High Technology and Innovation estimation [19], the companies will significantly increase the share of expenditures on research and advanced development works conducted by the higher education institutions. In 2011-2013 the volume of financing such works will have a 78% raise, from 11,2 billion rubles in 2011 to 20 billion rubles in 2013 that will amount to about 12% of extra-budgetary expenditures on R&D work of the companies. Furthermore, in order to improve the quality of conducted research and development works almost all companies planned the conclusions of agreements on collaboration with the most important educational institutions for them. Structure and the amount of funding research and advanced development works conducted by the higher education institutions on the companies' assignments, as well as the change in amount of funding R&D works conducted by the higher education institutions on assignments of high-technology and service companies are shown in the following figures 3-4.

Figure 3: Structure and amount of funding R&D works conducted by higher education institution on companies' assignments, million rubles



Source: Author's calculation based on «Протокол заседания Правительственной комиссии по высоким технологиям и инновациям от 1 апреля 2011г. №2»

Figure 4: Change in the level of funding R&D works conducted by higher education institutions on high-technology and service companies' assignments, %



Source: Author's calculation based on «Протокол заседания Правительственной комиссии по высоким технологиям и инновациям от 1 апреля 2011г. №2»

It is planned that in 2013 the highest level of financing research and advanced development works assignments conducted by higher education institutions will be distributed by the general engineering companies (44% in three years), power supply companies (21,7% respectively) and high-technology companies (14,9%). In addition, transport companies are going to increase the amount of R&D works conducted by universities funding about three times, infrastructure companies plan 200% increase and the increase of military-industrial complex is going to be 180,5% (see Figure 4).

In addition, the innovative development programs assume the specific actions for participation of the companies' specialists in the training of students of profile universities and university teachers in improving the skills of employees of enterprises that will improve the focus of the companies on a continuous growth of the staff qualification. It also involves the growth of

expenditures on retraining employees over three years by 22%.

The conduction of free public competitions for the selection of organizations to be given the right to receive subsidies for the implementation of the complex projects in creating high-technology production is aimed at the development of cooperation between the Russian higher education institutions and the state enterprises [18] in which purposes in the 2010-2012 period 19 billion rubles were set to be allotted from the federal budget.

For the funding of integrated projects for the organization of high-tech production conducted jointly by industrial enterprises and universities, the enterprises can receive grants for the period from 1 to 3 years, and the amount of funding up to 100 million rubles per year. In total currently the support of 158 projects is being implemented - winners of three rounds of the competitive selection with the overall amount of the allocated federal budget of more than 28 billion rubles (about U.S. \$875 million). The total amount of extrabudgetary funds of the winning organizations aimed at financing R&D projects, is more than 32 billion rubles (about U.S. \$1 billion). One of the examples of active collaboration of universities and business is joint-stock company "Academician M.F. Reshetnev Information Satellite System" (JSC "ISS"). In 2012 JSC "ISS" invited 16 universities and 3 scientific research organizations of the Russian Academy of Sciences (RAS) to conduct R&D works. 55 research and advanced development works with a total of 357 million rubles were performed on the assignment of JSC "ISS", including the share of universities of 70%.

Another form of universities and business cooperation in the field of scientific research is the construction of technology platforms (TP) [20]. The public-private partnership in this field is used to attract real business in building and implementation of the system of values of innovative development. Presently more than 30 technology platforms in 13 areas (connected with priority areas of science, technological and technical development and with the country's critical technology list [19, 20]) exist in Russian Federation. Particularly, there are platforms in the fields of medicine and biotechnology, information and communication technologies, photonics, aerospace technologies, nuclear and radiation technologies, natural resources extraction and oil refining, energy and other fields. At present the given form of universities-science-business cooperation is on the stage of development, the structure of participants is dynamic (there are technology platforms with the participation of more than 200 organizations), the cooperation of forms are being searched. The analysis of the program documents shows the active participation in the formation and functioning of TPs of the leading universities of the Russian Federation that is confirmed by the participant composition of the TPs, and one of the activity areas is the assistance in the organization of the staff preparation in the interests of the TP participants.

For example, "Air mobility and aviation technology" TP considers educational activities, academic plans and programs refining in regard of the needs of science and business, personnel training and retraining, assignment of talented youths as one of the activities and the major activity. Among the technology platform participants there are 11 universities, 13 research organizations, engineering and development center, 9 holding companies, 7 manufacturing companies and 2 airline companies. The action plan for TP provides in 2013 the following activities: monitoring of staff provision of the enterprises and organizations participating in TP, also the consideration of proposals on the assistance in the further and advanced training of the research and engineering staff.

Thus, participation in technology platforms allows universities to expand competences that are of interest for business (training, engineering, long-term forecasting activities), to improve the quality of training of specialists considering the required technological competences, to actively attract students and post-graduates to the project activities, forming in them research and entrepreneurial competences.

At the present day in Russia has appeared a socially oriented business that provides welfare work in different areas, in particular – supporting educational institutions, separate students and instructors. One of the first funds in the modern Russian history was Vladimir Potanin Foundation. It has an annual budget of more than 300 million rubles to implement programs in the culture and education field. One of the funding areas of the fund is support of the talented teachers of higher educational institution, encouraging their professional and personal growth that is "Grants to young teachers of the state universities of Russia". Since 2001 to 2012, more than 3,300 teachers from 83 leading public universities of Russia took part in the contest, they were awarded with 1402 grants [13]. In 2012 120 grants were issued to teachers from 58 leading public universities in Russia. The amount of grant was 45,000 rubles in the first half of 2012, 50,000 rubles in the second half of 2012.

Another example of realization of welfare business projects in education is the contest of students' projects by the "RusHydro" company [5], carried out since 2009. The main goal of this contest is long-term vocational training of personnel for the work in hydropower industry by finding gifted youths that are inclined to practical and research activities in this field in the most wide range of vocations.

5. Conclusion

According to the results of the conducted research it is possible to make the following conclusions:

- the creation of the network of research and federal universities, activation of state financial support for business community, scientific research community and training of specialists considering the needs of business in regional universities of the Russian Federation confirm the growing role of universities as centers for generating new knowledge;
- the results of the conducted research show the increased state intervention into universities' activities in order to strengthen their collaboration with business. Basic forms of universities and business communication are stimulated mainly through various programs of public-private partnership;
- higher education institutions and business structures need each other as potential sources of activities. Specific nature of universities and business cooperation lies in encouraging educational institutions to carry out the new level of quality for educational activities and to conduct researches and collaborate projects. As the researches have shown, this cooperation results in the growth in the number of young researchers that are involved in scientific researches, an increase in extra-budgetary funding, appearance of new modern research directions required to strengthen innovative development of country's economy et al.;
- a new form of communication between universities and business is formed as the result of appearance of socially oriented business, involved with welfare work in various directions, particularly supporting educational institutions, specific students and instructors;
- the possibilities of the development of communication between universities and business

in the Russian Federation mostly depend not on the government encouragements, but on the activization of the participants of the “universities-business” cooperation.

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