# Partnering universities and companies in Russia: effects of new government initiative

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**Abstract**

The paper presents the results of 2-year survey conducted in 2011-2012 among Russian universities and companies who jointly implement R&D projects aimed at development of high-tech manufacturing. The joint projects represent a new government instrument to stimulate the development of linkages between universities and companies by giving matching grants for R&D to companies with obligation to order R&D to a university-partner.

The objectives of the survey included analysis of motivation for cooperation both from side of universities and companies; primary effects and side-effects of such initiative; changes that may be introduced to the government regulations concerning matching grants.

Total 38 teams were surveyed. Our findings show that major motivations from side of universities were access to new practical research tasks from companies, selection of most competitive teams of researchers capable to work with companies, and strengthening reputation in business environment. Companies were interested in getting government funding in order to solve their technological problems; to strengthen, due cooperation with universities, their research capacity, and to use modern research infrastructure located at universities.

The analysis allowed identification of the major effects of the matching grants mechanism. They included: strengthening of university orientation towards solving practical tasks which are of interest to business; institutionalization of relations between universities and business in the sphere of innovation activity; broadening of research cooperation and the formation of research consortiums; harmonization of research and educational tasks in universities, and orientation of the parties towards continuing cooperation in the innovation sphere.

**Keywords:** STI policy evaluation, public R&D subsidies, matching grants, university-Industry linkages, behavioral additionality, innovations

**JEL classification:** D22, H25, I23, O31

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## 1. Theoretical Framework for R&D Subsidies

In past decades radical changes in conditions for innovative activity have occurred all over the world. Governments substantially transformed their approach to innovations . With globalization and growing international competition, policy towards innovations has shifted from being neutral to more proactive, in the form of direct state stimulation of the innovation processes.

There is a wide variety of instruments in support of innovations that have been applied in various countries. These include tax exemptions, target credits, state subsidies, etc. S*ubsidies to companies for R&D occupy a special place in the list of instruments.*

At the beginning of 1990s, the neo-classical theory of growth was widened in a number of research papers (see Romer, 1990; Segerstrom et al., 1990; Grossman, Helpman, 1991; Aghion, Howitt, 1992), illustrating the fact that subsidies for R&D stimulate companies to channel more resources for research and development, resulting in a positive effect on economic growth. Later, a number of theoretical models were developed (see Howitt, 1999; Segerstrom, 2000) to evaluate long-term effect of subsidies on R&D for economic growth.

Teubal (1996, 2002) pointed out that the successful penetration and dissemination of R&D in the new industrial countries was based on intensive group training ("learning by others") and multi-discipline training with the positive results of such learning cumulative through time. Exactly neutral and wide support of R&D at its initial stages makes it possible in the future to identify real market slumps on the basis of sector specifics and to switch to a more selective policy to stimulate innovations.

Within the framework of the evolution approach Bach and Mats (2005) believe that learning failures are basic and interpret them as a limit or constrain to the use of the cognitive capacity of agents and groups of agents. In this connection they draw attention to such problems as lack of coordination between agents, poor development of institutions for the joint development and dissemination of knowledge. This also includes poor tuning and de-synchronization of institutional changes with the current technological changes, codification complexity (lack of standards and platforms), barriers to absorption, etc. It is also noted that support for corporate R&D should be treated, on the one hand, as a mechanism mitigating risks and sharing expenditures, while on the other as a method for developing network interaction and the creation of new collective knowledge.

Since the middle of the 1990s, the practice of public subsidies to companies for R&D began to spread out to the new industrial countries and then to the developed countries. During the last two decades, R&D subsidies to companies remain an important instrument of state innovation policy of the EU countries, Israel, and the USA. To a substantial degree this provided a broad basis for empirical studies of effects of R&D subsidies on companies and also for comparing the results of this instrument with other measures to stimulate innovations.

## 2. Effects of Public Subsidies for R&D on Companies: Evidence from Abroad

The effectiveness and results of various instruments for support of R&D investments is one of the key questions in government innovation policy, particularly in the situation of growing budget limitations that is under way in many countries.

Data for EU countries show that in comparison with tax exemptions public financing of R&D at business sector results in more long-term effects (Guellec, y Van Pottlesberghe, 2003). The advantage of R&D subsidies is also associated with their potential for companies to "compensate" market uncertainty. This was empirically confirmed by Czarnitzki and Toole (2007) on the basis of data for production firms in Germany. Therefore if tax exemptions promote primarily the expansion of existing innovation projects, subsidies are directed at the launching new and more long-term projects. Berube and Mohnen (2007) pointed out that the firms receiving grants are more often innovators of an international level and are more successful in commercialization as compared with recipients of only tax exemptions.

Public financing for R&D in business sector accompanied by co-financing is often called "matching grants". Matching grants have other advantages in comparison with other financial instruments to support R&D at companies. They are extremely important for startups and for firms that have launched innovation programs (Hall, Maffioli, 2008). These grants lower the start barrier, promote cooperation and simplify access to outside knowledge.

Hall and Maffioli (2008) systematized the results of evaluation of grant programs in Argentina, Brazil, Chile, and Panama and noted that in all these countries *there were visible positive effects in raising innovation activity of companies, in particular in boosting corporate expenses on R&D.* The participation of firms in these programs also stimulated positive behavioral changes – a much more active approach by the owners of these firms to innovations and broadening of foreign cooperation. However with regards to improvement of outcome indicators, the results were much more modest. The authors pointed out that possibly this were due to the short period of time. Nevertheless, no statistically reliable empirical data were obtained to testify any positive impact on the number of patents or the volume of sales of new products. With regards to improvement of the overall company competitiveness indicators – such as larger market share, higher productivity – they turned to be indefinite. From one hand there was a positive correlation with the company growth, but from the other - no tangible improvement in productivity.

With the widening practice of R&D subsidies to companies, including those based on "inter-country transfer" and accumulating of subsequent experience, there were identified new problems and risks associated with the application of such instruments. A number of researchers – David, Hall, Toole, 2000; Klette, Moen, Griliches, 2000 pointed out that the effectiveness of public support of R&D in a company could stimulate rent seekers behavior among economic agents with the possible substitution of public funds by private resources. In the

course of analysis of the Small Business Innovation Research (SBIR) program effectiveness, Wallsten (2000) discovered a similar substitution effect (it was more evident with the growing number of company personnel). Wallsten noted that the low demonstrative impact of subsidies may limit the multiplicative effect of spent resources.

One of the issues discussed was the influence of subsidies on boosting company innovation activities (growing investments in R&D). But that not always leads to improving of company end results, such as volume of sales of new products, its market share, and labour productivity. It was assumed, for instance, that additional company resources could be used to raise wages of researchers without any changes in the end result of their activity (David et al. , 2000). Besides, Catozzella and Vivarelli (2011) have discovered that with state support R&D expenditures of the companies are higher, however the effectiveness of these expenses is lower (with regards to product innovations).

The effects from R&D subsidies to companies are being actively discussed in Latin America, the newly industrialized countries, and the EU countries --Germany, Belgium, Italy, Finland, Austria (see, e.g.: Aerts, Czarnitzki, 2004; Czarnitzki, Hussinger, 2004; Czarnitzki, Licht, 2006; Czarnitzki et al., 2007; Takalo et al.,2008; Wanzenbock et al., 2011; Czarnitzki, Bento, 2011).

The systematic study conducted by Guellec and v Van Pottlesberghe (2003) occupies a special place in research aimed at evaluating the influence of R&D subsidies on companies in EU countries. The study examined the effect of state financing of company R&D expenses in 17 EU countries for the 20-year period. The researchers also discovered a positive influence of subsidies on R&D financing from side of business. It was noted that target programs for financing companies' R&D ensured better perception and the use by these companies of knowledge generated by the universities.

Cerulli and Poti (2010) examined the effects of subsidies on Italian firms and found out their overall positive influence – both at the stage of increasing R&D financing and the end result – in form of growing number of patents. According to their assessments due to subsidies the additional growth of expenditures on R&D was 40% while the number of patents increased by 3.5%. Meanwhile, the authors identified substantial differences between the two groups of firms: the first group demonstrated positive changes while the second one was associated with the substitution of state resources for private finances. The first group was moiré oriented on obtaining patents and increasing its fixed capital. This group included a big number of large firms but at the same time it shared features of the second group in terms of R&D intensity, structure of expenses, and other indicators of corporate finances. The authors concluded that such results may be explained by two factors. First, larger firms are able to rely on the size effect, namely, they have larger potential for specialization, for entry into networks, for absorption of outside knowledge, for acquiring credits. Second, larger firms have more extended planning horizon, their strategy is more oriented at long-term capitalization. Small Italian firms constitute the traditional family property model combined with the fear to lose strategic control; finally, their owners give priority to current earnings.

Priority in research was given not that much to numerical effects of company activities, as to *changes in their behavioral pattern with regard to innovations*. On the basis of studies of 1,200 Austrian firms conducted in 2003, Falk (2006) undertook an integrated analysis of effects with emphasis on changes in their behavior. It was noted that large firms demonstrate more often positive changes in their behavior. With continued support there is greater probability for such changes due to their cumulative nature. Wanzenbock, Scherngell, Manfred (2011), studied the activities of 155 firms in Austria and received somewhat different results related to the nature of firms that are ready for a change. The conclusion is as follows: young, small, and technologically specialized firms are much more ready to change their behavior than companies with larger resources for R&D. In this, authors' conclusions are close to those made by Hall and Maffioli (2008).

In terms of assessing possible demonstration effects it is important to note that in his studies Falk (2006) identified some positive effects already at the stage when firm applies for subsidy (even if later the application is rejected). For some firms the very participation in the competition serves as additional motivation to pay more attention to relevant issues.

The highly original study conducted by Aschhoff (2009) deserve special mentioning. It was based on data covering German firms during the period from 1994 to 2006 and was assessing the influence of grants on support of research projects at companies (DPF grants - Direct R&D Project Funding grants). It was shown that the effect of subsidies depends on their size – small grants are less effective. The conclusion was also made that companies with a history of state support (grant recipients) are more inclined to increase their private investments in R&D. However there were no tangible signs that firms with regular public support are less efficient. Aschhoff assumed that this may be associated with the planning effect, i.e. firms may take risk while being aware (based on its previous experience) that the support will be provided later on.

Clarysse, Wright, Mustar (2009) studied the factors which determine the essence of behavioral patterns on the basis of a poll survey of 194 companies that had received subsidies within the framework of the IVVT program (Belgium, 2001-2004) and 84 companies of the control group (that conduct innovation activity but did not received subsidies). The result underlined the importance of the learning effects and identified the fact that inter-organizational interaction stimulated behavioral changes. At the same time the authors have discovered that the learning effect becomes less important with the growing number of projects implementedby the company with the support from the federal budget. This somewhat contradicts to the conclusions of other experts who generally positively assessed the influence of repeated support procedures (Falk, 2006; Aschhoff, 2009).

Overall, matching grants are being considered by experts of international development institutions (Goldberg et al.,2011) as one of the best practices in government innovation policy which deserves special attention and dissemination in countries with an underdeveloped innovation system.

Experts and consultants express mostly positive attitude towards R&D subsidies to companies, based on the results of numerous studies. At the same time it is pretty uncertain that this given instrument is "universally positive. On the basis of research papers presented in review on the subject of subsidies and their impact on corporate R&D (Alonso-Borrego et al., 2012) it appears that out of the 76 empirical micro-level studies 48 cases confirmed the hypothesis about attracting additional resources for R&D. But in 15 cases there were effects of substitution of public funds by private investments. In 13 cases there were no clear effects. If one takes in consideration not only micro-level studies but also research based on sectors and branches of industry, then 71 studies confirm positive effect of R&D expenses, 23 studies identify the substitution effect, and 24 studies show no effect at all. Thus one may see a broad range of studies which have failed to identify even such a basic effect of R&D subsidies as growing private R&D expenses.

Most likely, these results are highly dependent on local conditions in each country concerned, on the exact design of a mechanism to subsidize corporate R&D. Problems regarding methodology of assessment of state support effects remain serious. Therefore many aspects related to influence of matching grants require additional deep studies.

## 3. Mechanism of Matching Grants in Russia

During the last 5-7 years Russian innovation policy was developing rather rapidly. During the period of 2006 – 2008, with Russia's growing government resources, the goal was set to move towards innovation path of development. Judging from the actual measures undertaken, there was an attempt to stimulate in industry demand for innovations. At that time a number of important tax exemption acts were adopted for business, major financial development institutions were set up, and active steps taken to "build up" the innovation infrastructure (see, eg.: Zasimova et al., 2008; Dezhina, 2011; Simachev et al., 2012).

During the acute phase of the crisis (2008 – 2009), the task of stimulating innovation lost its priority and the budget allocations plus individual instruments of the innovation policy were partly "retargeted" to compensate losses caused by the crisis (Simachev et al., 2009). However, simultaneously federal level "re-evaluation" of the role of innovations in terms of ensuring competitiveness of Russian economy was undertaken. As a result the goal of modernization has been finally rooted as one of the main declared government priorities.

Starting from the second half of 2009, there was a re-activation of the innovation policy and not only within earlier implemented directions (tax stimulation of innovation, building up of the system of financial development institutions ) but also aimed at initiation of basically new measures (the Skolkovo innovation city, technological platforms, "push to innovations" applied to major state-owned companies, and the mechanism of matching grants). A specific feature of the Russian innovation policy during the post-crisis period was the growing attention to cooperation among the major actors of the innovation process, the development of networks and partnerships within the innovation sphere, and stimulation of research activity within universities.

However the overall situation in innovation sphere may be characterized as not very optimistic in terms of pace of R&D activity in business sector and "connectivity" among actors in innovations system (tables 1 and 2).

Table 1

**Selected Indicators of Innovative Activity in Russia, 2006-2011**

| | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|---|
| Intramural expenditures on R&D, in % to GDP | 1.07 | 1.12 | 1.04 | 1.25 | 1.16 | 1.12 |
| Allocations on civilian R&D from the federal budget, in % to GDP | 0.36 | 0.40 | 0.39 | 0.56 | 0.53 | 0.58 |
| Government expenditures in the total on R&D, % | 61.1 | 62.6 | 64.7 | 66.5 | 70.3 | 67.1 |
| Business enterprise expenditures in the total on R&D, % | 28.8 | 29.4 | 28.7 | 26.6 | 25.5 | 27.7 |
| Share of organizations that conduct technological innovations, in % to the total number of organizations* | 9.4 | 9.4 | 9.6 | 9.4 | 9.3 | 9.6 |
| Share of expenditures on technological innovations in % to the total volume of goods produced, works conducted, services implemented* | 1.4 | 1.2 | 1.4 | 1.9 | 1.5 | 1.5 |

*) Resource extracting, Дmanufacturing, electric power, gas and water production and dissemination plants

*Sources:* HSE. (2012). Science and Technology Indicators in the Russian Federation. Higher School of Economics, Moscow; HSE. (2012). Indicators of Innovation in the Russian Federation. Higher School of Economics, Moscow. Data for 2011: http://expert.ru/2012/12/10/tochka-kipeniya/?ny

Table 2

**Indicators of the Level of Development of Innovation System, on Scale from 1 to 7, according to Knowledge Economy Index, World Bank (data for 2010)**

| Indicator | USA | UK | Germany | France | Japan | China | Russia |
|---|---|---|---|---|---|---|---|
| Level of private sector expenditures on R&D | 5.4 | 4.6 | 5.7 | 4.7 | 5.9 | 4.1 | 3.2 |
| Cooperation between universities and companies | 5.8 | 5.6 | 5.2 | 4.0 | 4.9 | 4.6 | 3.7 |
| Level of protection of intellectual property rights | 5.1 | 5.3 | 5.7 | 5.9 | 5.2 | 4.0 | 3.0 |
| Availability of venture capital | 3.8 | 3.0 | 2.8 | 3.2 | 2.8 | 3.3 | 2.3 |
| Development of value chains | 5.1 | 5.5 | 6.3 | 5.7 | 6.3 | 4.0 | 2.6 |

*Source:* http://info.worldbank.org/etools/kam2/KAM_page3.asp

Instrument of matching grants became one of the government measures aimed at bridging the gap between supply and demand for innovations and to boost private investments in innovations. On April 9, 2010, the Government of the Russian Federation adopted decree # 218 "On measures of state support for developing cooperation between Russian institutions of higher education and the organizations that implement integrated projects aimed at creating high technology production". This decree identified the mechanism of competition-

based subsidies on R&D with the aim of financing integrated projects conducted by production enterprises and higher education institutes (universities) in order to organize high tech production.

The Russian mechanism of matching grants may be characterized by the following parameters:

- A competition based support from the federal budget – subsidy recipients are selected on the basis of an open competition;
- The commercial nature of projects - realization of an integrated project aimed at creating a high tech production is supported;
- Support of partnerships and stimulating demand of companies on R&D. The project is carried out jointly by the company and university. The recipient of the subsidy is the production enterprise which uses the funds to finance R&D conducted by the university within the framework of the joint project;
- A substantial research component in the project. The subsidy is provided for a period of one to three years in the amount of 100 million rubles (approximately 3.3 million USD) annually to finance R&D conducted by the Russian higher education institute;
- Co-financing and distribution of risks. The production enterprise should invest into the project amount of money equal to at least 100% of the subsidy. The organization of a new high tech production facility is financed from own company's resources and at least 20% co-financing shall be used for R&D;
- Expected duration of the project and its monitoring. The production enterprise shall provide information on high tech products developed under the project during at least 5 years after the closure of the subsidy contract.

By December 1, 2012, a total of 95 companies and 87 higher education institutes participated in projects aimed at creating of high tech production.

The mechanism for providing subsidies under Government decree # 218 is the first instrument in Russia conceptually similar to the "matching grants" mechanism implemented in a number of countries. Although there are many basic similarities with foreign practice, some insignificant specifics of the Russian mechanism with regard to "matching grants" may be identified, such as:

- Only higher education institutes are allowed to be R&D partners for business in order to obtain government subsidies;
- There is no emphasis on support of private companies' projects;
- Absence of provision to support consortia of enterprises;
- No regular (permanent) procedure for the receipt, evaluation, and support of joint projects by business and universities;

- There are a number of barriers for participation of small and rapidly growing companies in the partnerships.

Although “matching grants” usually constitute a mechanism aimed at stimulating business demand for innovation and R&D, in case of Russia it has developed to a considerable extent into an instrument encouraging universities to cooperate with business. In fact, this mechanism is seen by the government as a method of “teaching” and adapting universities to understand the R&D demand from side of business.

## 4. Methodology and Basic Hypotheses

The research results presented in this paper are based on informal problem-focused interviews with representatives of companies and universities implementing joint projects on the basis of matching grants.

The use of company and university representatives as initial data sources seems very important when the accent is given to evaluation of behavioral changes. First, in such case there is less probability to face to cautious respondent since behavioral additionality is outside of the sphere of officially monitored results. Second, behavioral effects are basically descriptive. So the use of close-ended questions and a formalized questionnaires will not be beneficial. Behavioral additionalities are poorly digitalized and require qualitative evaluations.

*The preliminary results of the study are based on the analyses of interviews conducted in 2011-2012 -- 38 detailed interviews covering 28 projects* which received federal support in 2010 within the mechanism of matching grants (27 interviews with representatives of 15 institutes and 11 interviews with representatives of 8 companies).

The main directions of the study nts were based on the following questions:

1. How did the “design” (the normative framework) of matching grants mechanism affect the composition of participants in the project ? Who was the main initiator to apply for subsidy?
2. What were the main initial motivations of the parties (the universities and companies) to participate in a project based on matching grants mechanism?
3. How the importance of various problems has changed in the course of project implementation? Which problems are temporary and which are of long-term nature?
4. What are the main effects (both positive and negative) of participation in projects ? What are the lessons learned by the participants and how do they assess the prospects for further cooperation ?
5. What can be done in order to improve the matching grants mechanism and to increase its efficiency?

The following preliminary *assumptions* were made for further study and clarification:

1. Universities are primary initiators to apply for subsidy since they are interested in receiving budget financing. Business is mostly interested in the engineering services provided by the universities.

2. In the course of the project implementation there will be both positive and negative behavioral effects within the companies and the universities involved in the project. The strongest conflict generating factor with substantial behavioral additionalities is the transition of control over the research results from the government to the company-recipient of the subsidy.
3. The interaction between universities and companies in the course of projects implementation will reveal many aspects due to mutual influence of scientific and educational processes. The subsidies will have a most substantial effect on the universities since they are better prepared to accumulate and disseminate the results.

## 5. The Results of the Analysis

### 5.1. Motivations of Companies and Universities

The analysis of responses to direct and indirect questions about the stimulus for participation in the competition for matching grants reveals a broad spectrum of reasons, both from universities and the companies.

From side of universities four major reasons should be mentioned.

First - most of university representatives pointed out that this is the first measure due to which the university could receive substantial resources for realization of a major research project with serious results. Despite the fact that many universities have sufficient financial resources they are nevertheless limited financially in conducting R&D.

The second important aspect was receiving practical tasks from business, identifying necessary directions for the development of research and engineering competences, the selection of the most competitive research groups. The representatives of a number of universities also pointed out that participation in such projects strengthened reputation of the university among potential business clients.

Third – the projects were seen as a measure to establish or restore cooperation with business.

Fourth – considerable number of university representatives see the matching grants mechanism as a method to support for their research activities, so they are viewed as one of the opportunities to acquire federal support for university development.

As far as companies motivations are concerned, they are, according to our assessments, associated with the following factors. Due to the fact that most companies are not ready to invest into R&D, particularly at the pre-competitive stage, they are more interested in dealing with technological and engineering tasks when it comes to identifying the content of the project.

A successfully developing company is mainly motivated by the perspective to acquire new technology which would increase company's competitiveness, broaden the volume of sales and will allow entering new markets.

Smaller companies are highly motivated by prospects to strengthen their human capital due to cooperation. In addition, for business it is important to use modern technological equipment within the framework of the project. In a number of universities in recent years there were major improvements made in their technological and testing facilities.

According to our observations small companies were highly motivated by the prospects to get additional resources for their innovation activity, while it was not a major factor for big enterprises.

### 5.2. Effects of Matching Grants Mechanism

We do not examine here direct effects which are associated with the project goals (e.g. growing R&D expenses by companies, additional volumes of innovation product, etc.). We believe it is more important to evaluate the external, institutional effects brought by the matching grants mechanism.

The positive effect of matching grants associated with the orientation of universities on R&D demand from business has been cited by many university representatives at various levels of authority. For university presidents this is an important factor from the point of view of market demand for university services. It also means diversification of institutional activity and for the university researchers - an opportunity to be involved in implementation of practical tasks. The real interest displayed by business in a number of projects may be considered as one of the major result of matching grants mechanism.

Here are some quotations derived from interviews with university representatives:

"… *I see a sincere interest of company when I communicate with businessmen. I feel whether people have genuine interest or not. In one project this interest is pronounced – these people have shining eyes and they want to know what the university can do for them within the framework of the project";*

*"…. They got more deeply involved in the projects which promise real product. This entails greater responsibility and higher quality … This confirms that working for the sake of making a product requires special responsibility. There should be high standards set for the project implementation."*

Participation in joint projects also allowed universities to identify the most productive researchers. In a number of cases these were companies who selected university researchers for the joint project and thus matching grants mechanism gave an opportunity to support the best university specialists.

Some cases show that matching grants opened the way to institutionalizing partner relations between universities and business. In one of the interviews a university representative pointed out that in the past the partner companies who needed a specific work to be done preferred to sign contracts directly with the researchers. This form of relations inevitably resulted in conflict of interests. The realization of projects stimulated the formation of joint research groups, enriching their potentials.

"*Does the university structure allow realization of this project? It does, because the partner university constitutes a conglomerate of its research department and the company. Accordingly, there is no shortage of personnel. If the project would involve only university researchers, then the deficit of the personnel would occur since there would be no engineers and designers involved in the project. They are all in the company-recipient of the subsidy".*

An important effect is that matching grants contributed to sustainability of new research groups that were formed for project implementation: "*One of the ultimate tasks following the completion of the project is to retain some kind of professional group", "we would like these ties to develop into some kind of laboratory that would be capable to perform interesting research tasks", " since this is a real project we see a personnel mix and the involvement of young specialists", "there came forth the idea of setting up a center of competence".*

In the course of their contacts with universities, some of the companies activated their interaction with other higher education institutes as well. In a number of cases the practical tasks of the projects could not be implemented only by the partner universities. This was the prerequisite for expanding the number of project participants and the formation of research consortiums – *"An important result was that in the course of the project implementation the company-recipient of the subsidy created a network of partner universities. Since this is a principally new task it turned out that it was necessary to recruit specialists from various institutes all over the country. The partner university did not have all the required specialists".*

The realization of a number of projects stimulated harmonization and enrichment of research and educational activity: at first, several projects were initiated by companies which personnel used to graduate from the partner university. Later, the university was able to attract students to research activities within the framework of the project with the ultimate goal of problem-oriented development of their competence and further employment at the partner company.

*"A positive factor for the university - additional financing which helps to develop R&D, allows setting tasks to graduate and MA degree students. Later, these researchers will be able to get a job at the enterprise".*

*"What do we expect within the next 2-3 years? The launching of a technological line at the plant which will be the source of further activity for university (training of students and promotion of R&D, adaptation of production)".*

Companies also demonstrated interest in the development of lecture courses for students and even in working out new directions for their training. *"University science suffers from huge financial limitations. The Government fails to resolve this problem and no one knows what is to be taught and what will be the cost of such education. For this very reason the company-recipient of subsidy thinks over starting a lecture course on logics at the physics faculty of the partner university".*

In conclusion it may be pointed out that most of respondents positively assessed the mechanism of matching grants. They stated that this instrument stimulated interaction between universities and companies. Direct contacts with business are much more interesting and productive for future development. This may be considered as one of the most important positive effects. Of no less importance is the fact that the matching grants encouraged universities to deal with industry and drew attention of business to possible partnership with universities both in research and teaching.

## 6. Discussion and suggestions

On the basis of analysis the following major effects of the matching grants mechanism may be identified:

- Strengthening of university orientation towards solving practical tasks which are of interest to business ;
- institutionalization of relations between universities and business in R&D;
- broadening of research cooperation and in some cases - formation of consortiums ;
- harmonization of research and educational tasks ;
- orientation of the parties towards continuation of cooperation in the innovation sphere.

It may be concluded that in the course of matching grants mechanism application, companies and universities are in a "positive conflict" with each other. Overall we see positive attitude to cooperation both from side of companies and universities. At the same time some of the following problems may become sharper:

- Distribution of intellectual property rights and its commercialization;
- Co-ordination of interests within the universities regarding planning R&D and commercialization of research results.

The matching grants mechanism turned to be more important for the development of applied and engineering skills at the universities. Application of the instrument stimulated demand on R&D from the companies and it should inspire business to invest more in R&D.

In order to achieve that, it is important to accentuate the inter-relation and mutual consolidation of various instruments directed at the development of linkages between universities and companies, at the development of university infrastructure, and commercialization of R&D results.

The mechanism of matching grants will be more effective if to ease participation of small and rapidly growing companies. It would be worthwhile to examine the possibility of creation of companies' consortia under matching grants. Such consortia may be established, for example, in innovative clusters.

So far this instrument is intended for a demonstration effect. In order to ensure stable and positive developments within the innovation sphere it should be applied during a longer period of time. Therefore it is important to stimulate the "transition" of this instrument to the category of permanent measures of government support of innovation activity. It is essential to examine the possibility of applying the mechanism of matching grants tby various government financial institutes for development in order to implement a continuous cycle of search, evaluation, and selection of innovative projects.

Last but not the least, matching grants mechanism is extremely valuable for its indirect, accompanying effects. Evaluation of the results of its implementation should take into account this factor and include measuring qualitative changes in behavioral additionality.

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