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Russian Policies in Support of Innovation: Elusive Quest for Efficiency

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Focused on the efficiency of the Russian innovation-fostering policy, the research is based on an empirical analysis of how policy instruments impact firms' behavior. The data is obtained from two surveys of more than 600 Russian industrial companies in 2011-2012.

The analysis shows that tax incentives are more conducive to innovations with a longer payback period, whereas public funding is more likely to facilitate launching new innovative projects. At the same time, both kinds of innovation support tools are affected by crowding out private funds by public ones. Besides, innovation policy design and administration are not friendly to young companies.

Keywords: innovation, firm behavior, tax incentives, public subsidies and grants, evaluation of government innovation policy

JEL Classification: L20, O31, O32, O38

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In the recent decades, in the context of globalization and increasing international competition, national governments pay more and more attention to fostering innovation in order to compensate for market failures, system failures, and failures in the ability to absorb new knowledge. There is a wide range of innovation-supporting instruments: tax incentives, public funding, institutes for development, etc. However, the issues of efficiency and advisability of different support policies are crucial, especially in the situation of budget constraints. It is necessary to choose innovation support policies that would be efficient enough while not tangibly distorting the market environment.

Progress in learning new innovation support mechanisms and their application in Russian innovation policy has become apparent in the last few years¹. Nevertheless, experience both positive and negative experience of earlier-introduced support policies application is largely neglected when new policies are being designed. Moreover, expert discussions of improving public spending efficiency and development of the Russian tax system have demonstrated that the debate of the pros and contras of different approaches to innovation still brews in Russia, even at a very high level of generalization, e. g., when comparing tax and financial incentives.

For all its multidirectionality, the innovation policy realized by the state still lacks one necessary attribute: regular independent progress evaluation. Although there is a general practice of macroeconomic evaluation of budget losses and short term benefits from the use of innovation support policies, there is no integrated system of analyzing the impact of different support mechanisms on innovation development at the micro level, such as change in companies' behavior, shifts in preferences of major stakeholders, developments in cooperation with research institutions, and increasing learning capacity.

In this context, *the main objective of our paper is a micro-level study of how support mechanisms impact companies' innovative behavior. We also evaluate effectiveness of tax and direct tools to support innovation and compare positive and negative effects of these policies' application.*

1. The research agenda: main questions and hypotheses for empirical testing

The general agenda of the study is determined by the sequence of six questions:

(1) To which extent increase in firms' productivity is connected to their innovation activity?

¹ See (Simachev, Kussyk, 2013) for detailed analysis of state innovation support policies.

- (2) How does state support of innovation impact the quality of firms' innovation activity?
- (3) What companies receive state support for innovation more often?
- (4) How does the system of state-business relations affect allocation of state support?
- (5) What is the difference between how financial and tax incentives influence companies' innovation activity?
- (6) What accounts for the costs of companies' access to innovation support incentives?

Regarding the above-mentioned questions, *we have put down several propositions for further empirical testing:*

1) To what extent firms' productivity growth is related to their innovation activity? What are the basic parameters that determine increase in productivity?

We initially assume that there is a general positive correlation between innovation activity of a firm and its increased competitiveness, in particular, the increase in its productivity. However, this recognition of innovation influence does not exclude the possibility that certain firms can find other ways to maintain their competitiveness, of which classical examples are: a firm's abuse of its market monopoly (Bogetic, Olusi, 2013), lobbying, receiving state support (not necessarily for innovation) by ineffective companies considering their social importance. Due to this circumstance, firms of significantly disparate productivity are allowed to exist in the same market for fairly long time. Extremely high heterogeneity of firms in terms of productivity, both within and between industries, has been highlighted in a study of the European Central Bank (Giannangeli, Gomez-Salvador, 2008). Such imbalances are also observed in the Russian economy, and lack of staff turnover is pointed to as a major impediment to equalizing productivity levels among enterprises (Bessonov et al., 2009)

Since technological level of Russian companies is largely below the level of foreign competitors, borrowing technology through the acquisition of new equipment should prepare a significant jump in productivity growth (Mckinsey Global Institute, 2009). Imitational development involves lower risks, is characterized by significant training effects and often interpreted as a first step in the transition to innovation economy (Mukoyama, 2002).

In principle, innovation provides other opportunities beside the productivity growth, e. g., cutting staff while intensifying labor; however, we supposed that companies were considerably limited in their ability to optimize the number of their employees, partly because of government pressures.

Proposition #1. The majority (most probably, the great majority) of companies who have recently increased their productivity are innovatively active. The increase in productivity is first of all determined by the firms' investment in new equipment.

2) What is the role of state support in companies' ability to innovate? What indicators of companies' performance are significantly improved thanks to their use of state support?

Many authors recognize the importance and effectiveness of state support of innovation (Goldberg, Gobbard, Racin, 2011; OECD, 2011). At the same time, they also point to problems and risks associated with state intervention. State support of innovation is important in terms of fostering change in companies' behavior, but there are quite significant lags in improving outcome indicators of innovative firms and their competitiveness (Lopez-Acevedo, Tan, 2010; Roper, Hewitt-Dundas, 2012; Shin, 2006). We suggested that, for a considerable number of companies, the risks of using state support are rather high. Costs associated with obtaining support, such as more frequent inspections and commitment to price regulation, have been confirmed empirically (Frye, 2002). These risks incite well-to-do companies to innovate without state support.

Certainly, there are risks of rent-seeking behavior of companies receiving state support. We can expect that companies interested in getting rent will not be strongly motivated to make effective use of acquired resources. Meanwhile, the state in the situation of asymmetrical information faces the difficulty to evaluate business efficiency and has to focus on more transparent and easily observed indicators, such as the volume of new products or export. Thus programs of direct public funding in New Zealand have had a positive effect on the dynamics of recipients' sales dynamics, but did not affect productivity and value added (Morris, Stevens, 2010).

Hypothesis #2. Significant number of companies innovate without state support while achieving great success in improving their performance (productivity and profitability). At the same time, state support of innovation stronger promotes improvement of output indicators in volume terms (amount of the revenue, volumes of new products and export).

3) What companies receive state support for innovation more often?

One of the most evident displays of 'state failures' in implementing its innovation policy is the state's excessive inclination to support big companies. The positive correlation between the scale of a business and the probability of its receiving state support has repeatedly been observed in empirical studies (Aschhoff, 2010; Fier, Heneric, 2005).

Increased share of large enterprises among recipients of state support witnesses about the reluctance of the state to risk (Garcia, Mohnen, 2010). It is clear that a small number of large recipients instead of a great number of small ones reduces transaction costs of funds allocation and simplifies control of their use. Besides, the proximity of big business to the state allows lobbying for additional financing.

It is known that large enterprises innovate more often, so bias towards supporting big business ensures a pseudo-positive result necessary for reporting. At the same time, many empirical studies (see, for example, Lööf, Hesmati 2005; Wanzenbock, Scherngell, Manfred, 2011) indicate that positive impact of external financing is significantly higher on small enterprises, since they make more efficient use of the funds, and their behavior is more sensitive to external financing.

In Russia, the tendency to support big business has additional grounds, specifically, social ones: concentration of labor at large strategic enterprises compels the state to pay them more attention (Simachev, Kuzyk, Kuznetsov, 2010). Furthermore, the anti-crisis measures to reduce tensions in the labor market were continued after the main phase of the crisis had ended (Zubarevich 2010).

Another possible distortion in the implementation of the state innovation policy is excessive support of partially state-owned companies. Interaction with such companies decreases uncertainty for decision-makers providing state support. Besides, public companies may have better skills of interaction with authorities.

Hypothesis #3. Companies likely to receive state support of their innovation are: (1) big, (2) partially state-owned.

4) How does the model of state-business relations influence allocation of innovation public funding?

The system of business-state relations is the most important element of the national business climate, which in turn has a decisive influence on companies' innovative activity (RSPP, 2011). The nature of this influence is not so obvious. On the one hand, state intervention in economy significantly distorts parties' motivation. On the other, the necessity for the state to support generation of new knowledge, promote connections among different actors, develop coordination mechanisms, and create search network for the innovation are generally recognized.

We suggest that the model of state-business relations can considerably influence allocation of state support. The traditionally strong integration between the state and business in post-Soviet Russia has transformed from the distinctive 1990s 'state capture' pattern to the 'business capture' pattern (Yakovlev, 2005). In whatever direction the connection works, the very

fact of companies' receiving public support may give rise to their informal commitments before the state (Simachev, Kuzyk, 2012). These commitments may limit companies' capacity to increase their efficiency and choose direction of their innovation, which in turn may reduce effectiveness of state support. We suppose that, due to the selective nature of state support, receiving direct public funding by companies will more often associate with the 'support in exchange for behavior' relationship pattern.

Hypothesis #4. The pattern of business-state relationship is one of significant factors of companies' having (or lacking) state support of their innovation; in addition, (1) the less the government directly demands from business – the fewer the facts of state support are; (2) the model of direct exchange of commitments will more often be associated with receiving financial support by a business than the use of tax incentives.

5) What are the features of tax and subsidies' effect on companies' innovative behavior? What are the advantages and disadvantages of their use as part of the state innovation policy?

Tax and financial innovation incentives vary significantly in their effect on business. Direct public funding measures suggest that sharing risks between business and the state reduce the degree of uncertainty. Direct funding may push a company to realize new projects. Equally important, reduced risks extend the planning horizon, resulting in initiated projects with a longer payback period that would not be implemented in the absence of public funding.

Tax incentives, by contrast, primarily stimulate investment in already-launched projects (Guellec, Van Pottelsberghe, 2000; Jaumotte, Pain, 2005). Redistribution of benefits in favor of ongoing projects serves to accelerate their completion or increase return on investment. Lastly, tax incentives may contribute to implementation of projects with lower rate of return (Köhler, Larédo, Rammer, 2012).

Differences between the two groups of innovation incentives are not limited by the features of projects they support. The neutrality of direct funding measures to the characteristics of company tax structure and the possibility to grant targeted and selective support thus lowering the recipients' risks (see Berube, Mohnen, 2007) have at a reverse side of the coin the problem of supplanting private expenses by the public ones, or the crowding out effect.

Companies-recipients of public financing may replace the funds they expected to spend on technological innovation by the funds received from the state and quasi-state organizations (Lach, 2002). The crowding out effect is also due to the fact that, in order to prove feasibility of funding programs, the state strives to demonstrate good performance indicators, resulting in

deliberately selecting successful projects that would have been implemented even without external involvement (David, Hall, Toole, 2000).

Since tax incentives directly affect the marginal cost of research, the crowding out effect in the case of their use is far less pronounced, and public spending on tax policy eventually pays off by additional investments by businesses. For example, it has been noticed that a ten-percent reduction of R&D costs may in the long run lead to a growth of over 10% (Bloom et al., 2002).

Hypothesis #5. Tax incentives and financial support have a different effect on companies' innovation: (1) financial incentives more than tax benefits reduce risks and contribute to the launch of new innovative projects; (2) at the same time, the problem of supplanting of private funds by the state ones is more typical for financial incentives.

6) What are the costs of companies' access to innovation support mechanisms, and how do the main problems and application risks of financial and tax incentives relate to each other?

To compare advantages and disadvantages of innovation support mechanisms, it is not only necessary to analyze their influence on companies' behavior but also to evaluate main problems (risks) associated with the use of these mechanisms. Contractors demand for the public support of innovation can be largely limited by deficient performance tuning and faulty design of these measures, as well as by unfriendly administration.

Specific advantages of a support policy in its influence on business almost always entail high costs and objective difficulties of its administration. For example, one of the major utilities of tax incentives is expressed in the principle of 'neutrality,' when decision to support is taken automatically if applicant meets formal criteria known in advance (OECD, 2002), but it also increases the risks of benefits misuse.

Another factor that is important to take into account when evaluating access to support mechanisms is the deterring effect. As it was earlier shown in the example of Spanish firms, many firms give up launching innovative activity because of overestimated expectations about upcoming challenges (D'Este et al., 2012). In Russia, the problem of distortion of real problems is significant due to the underdevelopment of the civil society institutions and difficulties of obtaining independent expert evaluation. The effects of 'negativity,' when assessments of theoreticians are worse than those of practitioners, have already been described in Russian macroeconomic studies. For example, respondents poorly oriented in corporate regulation evaluated the quality of pertaining legislation lower than experts did, and respondents with no experience in dealing with judicial system more negatively assessed the practice of Russian arbitration courts (Golikova et al., 2003).

Hypothesis #6. Perception of problems and risks of use of innovation support mechanisms that is dominant in the business environment is more negative compared to the real situation. This trend is responsible for the significant deterring effect that discourages businesses to use support mechanisms.

2. Methodological approach: initial data, features, and limitations

This research is based on the microeconomic data obtained from surveys of companies' senior executives. The use of surveys for economic analysis has become fairly widespread in Russia. This approach has both its advantages and drawbacks, which we are not going to discuss in detail, since fortunately they have already been systematically examined (Dolgopyatova, 2008). Suffice it to say that surveys provide significant opportunities to evaluate how diverse state policies affect behavior of economic agents (see, for example, (Gershman et al., 2004), (Zasimova et al., 2008), (Sushkevich, Avdasheva, Markin, 2013)).

In this paper, we have focused on the advantages of using surveys of companies' senior management in order to reveal behavioral changes, motivations, and limitations of decision-making at the enterprise level. We regard the possibility to assess characteristics of beneficiaries and effects of implementation of different state policies as especially valuable.

The empirical base of the research is comprised of two formalized questionnaire polls of Russian industrial enterprises conducted in September-October 2011 and August-September 2012². In the first case, the sample consists of 602 companies, and of 652 in the second, while the panel includes 415 companies (Appendix Table 1). Sampling of enterprises was determined by quotas of companies representing manufacturing industries.

The originality of this research is, as we see it, in the following:

(1) comparing different phases in the dynamics of companies' innovation activity, while distinguishing the following enterprise groups: those with no innovations; those who started to innovate over the past three years; those whose innovations are being continued; those whose innovations have been ceased in the past three years.

(2) more sophisticated analysis of change in competitive environment, compared to the typical 'insider/outsider' approach. In the past few years, partly due to intensive learning process, the differences in businesses' competition with domestic and foreign firms have gradually diminished. Thus the respondents were asked to evaluate the competition conditions in this

² The surveys were conducted by request of the Interdepartmental Analytical Center by HSE ISSEK Center for Business Tendency Studies.

extended circle of economic agents: old Russian firms, new Russian firms, Russian divisions of foreign firms, and foreign firms.

(3) analyzing the impact of innovation support mechanisms not only on output parameters, such as changing values of production and export and manufacturing new products, but also on changing companies' innovative behavior, choosing in-house innovation strategy (e. g., switching to the implementation of longer-term innovative projects, launching new projects, etc.);

(4) comparing gains in the mechanisms of innovation state support with possible typical risks (e. g., the crowding out effect), analyzing problems of companies' access to support mechanisms and administration of their implementation.

It is necessary to pay attention at some *significant limitations of this research*³.

First. We have examined companies' technological innovation only. Let us note that in research on economically developed countries, innovations support policies are most often analyzed narrowly, concerning their encouraging companies' R&D spending. We have regarded not only R&D-related incentives but also mechanisms promoting investment in new equipment.

Second. Certainly, comparing between two basic groups of policies, i.e., tax and subsidies, is a significant shortcut. However, even these generalized groups differ fundamentally by a number of criteria, e.g., universality or selectivity of choice, spending- or project-based approach, and indefinite or fixed duration of support.

3. Results of empirical study

3.1. Companies' productivity growth: innovation, imitation, or optimization?

Growth of labor productivity is a good indicator of company's development and transition to more efficient production. However, *there are different ways to increase productivity*. It might be the active strategy of boosting business competitiveness via its modernization, shifting to advanced technologies, staff training and development. Otherwise, it might be a passive, dilatory tactic associated mostly with cutting costs and intensification of labor.

We have chosen the logarithm of worker efficiency as an indicator of labor productivity. Given the pronounced distinguishing features of each industry, we have differentiated three groups of enterprises within each industry by the level of productivity: low, medium, and high. We have thus received the opportunity to group sample enterprises by the relative measure of performance. Based on the panel data, we have selected a group of enterprises that in 2011

³ We will not discuss particularities of the evaluation of how policies influence companies' behavior: see, for example, methodological commentary in (Simachev, Kuzyk, 2012).

demonstrated higher values of relative efficiency compared to 2010 (the share of these enterprises in the sample is 42%).

So how does the increase in productivity relate to company innovation? Our findings seemed unexpected to us (Table 2 of Appendix): among enterprises who demonstrated positive dynamics in their productivity, just every second one innovation!

At the core of the first – innovative – subgroup of enterprises with growing efficiency are successful young companies, exporting, and growing companies. Productivity growth of these companies is associated first of all with *increase in turnover* and *increased investment in fixed assets*. Notably, a significant share of this innovative subgroup is comprised of enterprises who have recently started to innovate. A noticeable increase in these firms' productivity can be attributed to the beginners' effects of transition to the innovative development strategy.

Regarding the second – non-innovative subgroup (which has also achieved increased productivity) – we could note that its representatives more often mentioned unfavorable financial situation, technological inadequacy, and lack of export. Companies of the non-innovative subgroup are characterized mostly by *personnel cuts* they have experienced.

Regression analysis that we conducted (it included several specifications: see Table 3 of Appendix) showed that *increase in productivity is observed mainly in the group of relatively small companies* (with staff of up to 250 employees). We have confirmed our initial observations: innovative companies have been mostly focused on investment in fixed assets. Notably, the level of spending on innovation does not affect the variable in question. Companies that had nothing to do with innovation have increased their productivity first of all by way of cutting their staff.

Obviously, if during the economic crisis companies' efforts to reduce their staff were actively checked by the government in order to maintain social stability, then certain easing of these restrictions after the crisis could further push companies to optimize their labor costs. In effect, this optimization became an available alternative to innovation on the way of maintaining business competitiveness.

3.2. State support of companies' innovation: is there a new quality?

Impact of innovative practices on companies' efficiency has many channels, whereas labor productivity as such is not an indispensable positive effect of innovation. Let us look at the evaluations of innovation impact both as volume indicators (total output, production of new and improved products, and export) and indicators reflecting efficiency of companies' operation (labor productivity, profitability, power consumption, consumption of materials, and environmental compatibility) (Fig. 1).

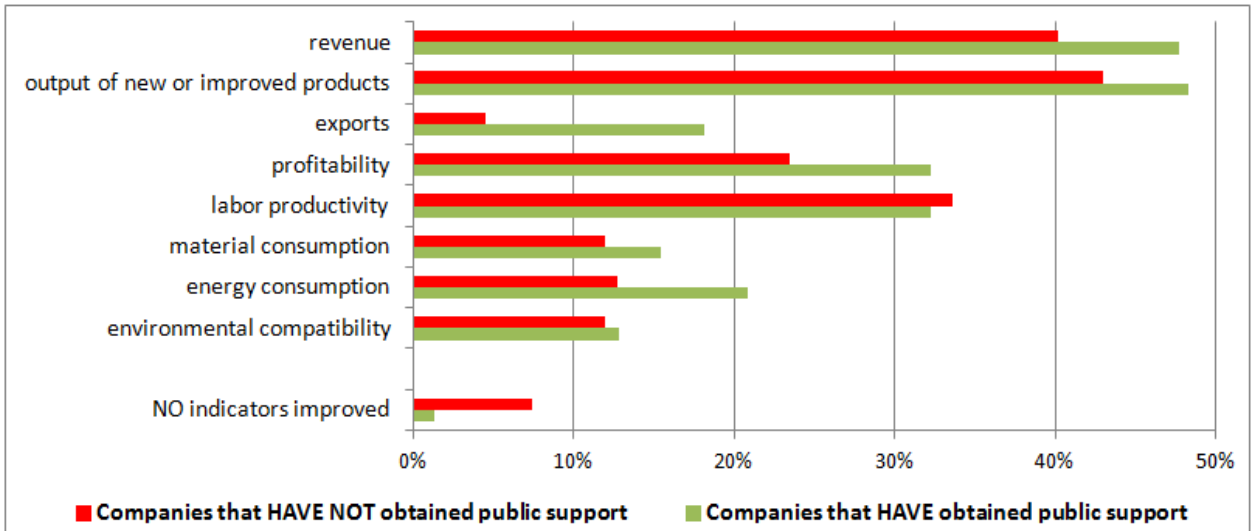


Figure 1. Improvement of companies' operation characteristics due to technological innovation in the past three years (frequency of responses of innovative companies' administrators)

Most common effect of innovation is the increased output: both total and innovative one. Innovation markedly more rarely affects performance indicators: only in about a third of cases, technological innovation brings about an increase in productivity, and in a quarter – profitability improvement. Of course, we can assume that initially, different goals were set at the start of innovative projects, which resulted in higher prevalence of some effects compared to other.

Be that as it may, the central question for us is not innovation particular effects, but what effects go more often with state support. In the analyzed sample, over a third of innovative firms are consumers of various instruments of state innovation support.

In general, *among state support recipient companies, the situation is almost always improved due to innovation, at least as reflected some output indicators*. This could be definitely attributed as well to the respondents' striving to report on the progress made; we suggest, however, that our use of subjective statistics and meeting anonymity requirements have largely reduced this risk of bias.

To evaluate effects of state support on innovation outcomes more accurately, we have conducted a regression analysis that let us significantly limit the effects of company selection for state support and government preferences. Results of this simulation allow us (Table 4 of Appendix) to come to two basic conclusions: on the one hand, companies who have been receiving support in recent years are likely to demonstrate at least some positive change, in terms of the parameters under consideration; on the other, *significant positive correlation with obtaining state support* has been revealed only in two characteristics of company performance: *export volume and energy efficiency*. Our initial hypothesis that innovative companies improve

their efficiency better without state support has not been confirmed: *availability (or absence) of state support by no means affects productivity growth.*

In general, the impact of state support for the majority of indicators considered is very weak, so we believe it is important to examine *a more conspicuous influence of companies' own parameters and the quality of external environment on the effectiveness of innovation.*

First, growth of volume indicators affected by innovation is typical for relatively large companies (500-1000 employees), regardless of whether or not they have state support. Apparently, small Russian companies are not motivated to increase their scale: it is likely that for them, the increase is associated with significant risks and costs due to the insufficiently favorable business environment, which has been repeatedly noticed in many studies in Russia.

Remarkably, companies demonstrating increase in total revenue following innovation are more often in optimal competitive conditions with foreign producers: among them, such competition is rarely non-existent or too strong; besides, *companies are pushed to develop and extend output of new innovative products by stronger competition of old Russian firms.*

Secondly, *positive dynamics of all indicators of resource efficiency – materials and energy consumption and labor productivity – are more common in large companies.* Perhaps this is because these companies are more resource intensive, characterized by excessive employment, and the main subject of non-market influences, including informal ones by government officials.

Third, *improvement of energy efficiency and environmental friendliness is conventional for either relatively new companies or otherwise old enterprises created in the Soviet times.* For young companies, this relation can be determined by initially high susceptibility to advanced technological solutions, whereas for the 'Soviet' ones – by their severely outdated technologies and subsequently the low base effect. In fact, it is no coincidence that gain in energy efficiency due to innovation is standard for companies who have encountered increased competition of old Russian enterprises. As for the environmental friendliness, this result of innovation is noticeable in companies who have confronted growing competition of foreign firms, e. g., when exporting to distant foreign countries (not of the former Soviet Union, or FSU).

Finally, *growth of profitability and labor productivity are not yet, judging by our sample, a top-priority goal in companies' innovative practices.* Companies start focusing on these goals when they have already lagged behind their competitors: it is usually companies with relatively low output level who experience improvement in these indicators. Interestingly, companies that are in the situation of less rigid competitive environment more often increase their profitability by means of innovation: probably because they have looser pricing opportunities, as well as firms with entirely private capital: we can suggest that in this case, business motivation to increase its cost effectiveness is less restrained.

In general, *we can track different strategies of companies' innovation that are hardly influenced by state support and much stronger – by the companies' size, as well as the status quo and change in competition.*

3.3. What firms become recipients of innovation state support more often: the needy or the deserving ones?

Interpretation of the innovation state support membership doesn't look like a trivial task at all. Indeed, what is better and righter, in terms of public objectives: to support a rather effective firm by additional resources and thus ensure the resources' efficient use, or allocate funds to a firm that is just starting to innovate while switching it to the innovative mode, but at high risks of failure and loss of funds? We can hardly arrive at somewhat unequivocal answer, given the system of rough evaluations available to us, but still the question as such is interesting: *is state support of innovation in Russia a bonus to the best or a chance to stragglers?*

Let us scrutinize what companies have become recipients (users) of innovation support mechanisms, including tax incentives and special purpose funding. Descriptive statistics (Table 5 of Appendix) witness about a certain shift of innovation state support in favor of big business. Regarding company age, there is a bias of tax incentives towards younger firms, whereas financial support is oriented at more mature companies.

Regression analysis (Table 1 of Appendix) *has not confirmed our hypothesis about the preferential position of big business in obtaining state support.* Neither have we found proof of the argument that state participation in companies' capital raises their chances to receive support.

In the recent years, well-off and exporting companies (first of all, those exporting to the non-FSU countries) more often became beneficiaries of state support of their innovation. Thus, *state innovation fostering instruments are more oriented at successfully operating companies rather than at 'outsider' firms.*

Companies created in the last five years and, more rarely, enterprises that started operation in the Soviet era are significantly more often represented among consumers of innovation tax incentives. Apparently, this is a consequence of a wide use by new firms of bonus depreciation (a one-time write-off of part of new equipment cost) in their generation and development of production base.

At the same time, we have not found advantageous position of young companies in terms of obtaining financial support. It can be argued that this result contradicts the findings of research on Spanish firms' behavior, one of which states that young firms often find themselves in the situation of harsh financial restrictions and thus prefer to use instruments of direct public financing that ensures project pre-financing (Bustom, Corchuelo, Ros, 2012). However, speaking

exactly of companies' *preferences*, this case would be also common for Russia: representatives of young Russian companies are more often interested in obtaining direct public financing as part of innovation policies (Ivanov, Kuzyk, Simachev, 2012). Preferences and access to the support, though, are not the same thing, naturally. Costs of access to financial support mechanisms in Russia can be quite high for young firms who do not have developed connections in the system of government agencies.

The use by companies of tax or financial support mechanisms is heavily dependent on the change in the competition. Apparently, although both the costs of state support use are significant and the instruments themselves are not very friendly to companies, but growing competition urges firms to use state innovation fostering instruments. Thus *the use of tax instruments is characteristic for companies in the situation of growing competition with new Russian makers, while enterprises that face stronger pressure of import more often receive direct public funding*. The first relation: *tax incentives vs. pressure of new Russian companies* is probably due to the fact that it is precisely new companies who more often than others resort to the use of tax incentives, so we can suppose that there is the training effect and competition for the best tax regime. As for the *financial support vs. import pressure* relation, it is likely that it manifests the state's propensity to protect national companies from external competition, doing it in various ways. Besides, this relation has also to be the consequence of the concepts of the necessity to support import substitution and expand domestic demand that are especially popular in Russia.

3.4. Models of building business-state relations: help in exchange for the right behavior?

We found it logical to suppose that the practice of providing state support to companies should be connected with the existing common model of business-state relations. We also suggested that the state's being friendly to the support recipients, the justice and transparency with which it conducted selection of companies to be granted support were the important elements contributing to the motivation of conscientious companies to use state support.

To characterize the system of business-state interaction⁴ (at the federal level), we have determined six conditional models (Table 7 of Appendix), among which first two models are

⁴ The idea to categorize models of state-business relations emerged owing to our getting familiarized with questionnaire of sociological survey *State of Business Climate in Russia* developed by VtsIOM (The All-Russian Public Opinion Research Center) agency. In the questionnaire, VtsIOM suggests a question: How do you think the authorities treat business, not in their rhetoric but in real life? We have tried to avoid excessive negative connotation of the question and associated prompts, added some significant, in our opinion, models, and presented an unfolded interpretation of different models in cues for a more precise respondent self-identification.

partnership ones, two following models imply social and political responsibility, the fifth model is oriented only at the state's fiscal interests, and the sixth model suggests non-interventionism by the state while maintaining formal enforcement of regulations in the business environment. It is precisely *the last models that are massively represented in the sample: models defined as indifference of the state to business (40% of companies) and as interest in business only as a source of income (29%)*.

Let us assess correspondences among the models of business-state relations and use (receiving) of state support, based on regression analysis (Table 8 of Appendix). First thing to be pointed to: the specified models of business-state relations are, as it has turned out, significantly related with the use (or, alternatively, non-use) of public support for innovation. Within relationship models *in which the state does not attempt to influence business behavior, companies are significantly less likely to use any instruments of public support for innovation*. We cannot, however, assert *what* in this relationship comes first: is it that state support is more targeted at companies responsive to the needs and requests of government representatives, or, instead, is it that, after companies have already obtained support, government officials get greater opportunity to control their behavior and bargain on some special 'game rules.'

Second. Positive correlation between the model of political loyalty and availability of state support for a company could be regarded as logical, but expression of this relationship through the use of tax incentives requires additional scrutiny. Perhaps politically loyal owners regard their business sufficiently protected from all kinds of inspections, including tax ones, but this is only a supposition.

Third. However unexpectedly, companies from whom the state expects social responsibility seldom become beneficiaries of innovation state support. Another disappointment (purely a researchers' one) to be pointed out: due to the selectivity of direct financial support and hence inescapable subjectivity of decisions, we supposed initially that companies acting by the social responsibility model can more than others count on getting this support. However, we obtained the opposite result. Perhaps whenever the state really needs the exchange, in particular for companies' social commitments, there are more convenient mechanisms for this purpose (rather than those related to fostering innovations), e.g., public procurement or providing support via specialized state-controlled banks.

3.5. Impact of state innovation fostering policies on companies' innovative behavior: can one choose the better between tax incentives and financial support?

Mechanisms of innovation state support affect companies' preferences, choice of corporate priorities, and determine the set of specific behavioral changes in firms' innovative

practices. While discussing the impact of state support on companies' innovative behavior, we examined the latter in terms of possible effects, in particular the change in innovative projects' parameters (increase in implementation terms and financial scale), changes in the use of resources (attracting additional private resources or release of funds for other business areas), reduction of innovation risks and ensuring commercialization of R&D operations (Fig. 2).

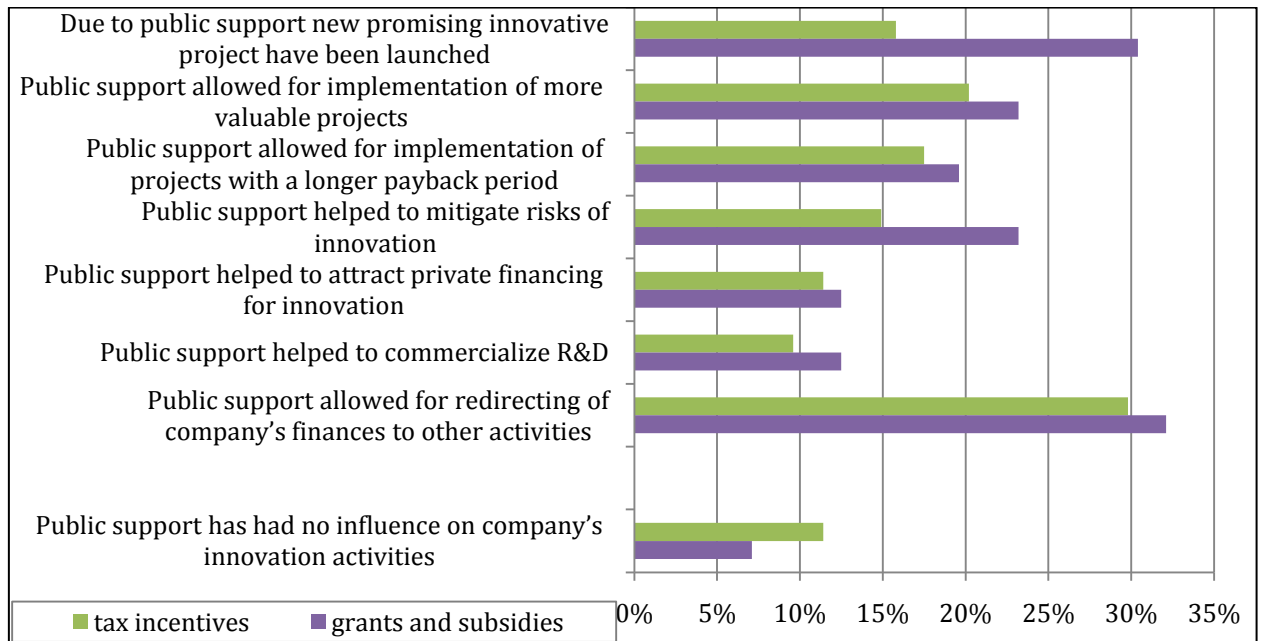


Figure 2. Impact of state policies on companies' innovative behavior (frequency of responses of recipient companies' administrators)

Considering descriptive statistics, we can see that, on the one hand, the proportion of respondents who reported the absence of any positive impact of state support on company innovation is very small: at the level of 10% in the group of companies who received public support. On the other, *the most common effect of innovation support mechanisms is positive for companies but negative concerning the results of public innovation policy, i. e. the release of company funds for other development areas*. This is nothing else but the effect of replacement of private funds with public ones (the ‘crowding out’ effect).

Comparing impact of different innovation support mechanisms, we can see that *the crowding out effect is significant not only in financial support mechanisms, but also in tax incentives*. This finding is in tune with results obtained earlier in the study (Lokshin, Mohnen, 2012), which pointed out significant presence of crowding out effect when tax incentives were used.

Let us proceed to the results of regression analysis (Table 9 of Appendix). First, *crowding out private funds by the public spending is observed more often in old companies (20 years old*

or older). Usually these companies have many diverse pending problems; hence innovation for them is far from being the only field to invest in. Furthermore, we can assume that these companies have had more frequent chances to use non-innovative ways to ensure their competitiveness, in particular by way of lobbying and receiving direct public funding thanks to their social importance.

Interestingly, *the effect of state support associated with realization of bigger projects* that is to some extent inverse to the crowding out effect *is typical for partially state-owned companies*. Perhaps state officials pioneer expansion of innovation in these companies (the known and popular logic of forcing public sector companies to innovate), and besides, as noted in Russian and foreign studies, representatives of the state, due to information asymmetry, usually pay more attention at simple and clear indicators, such as those associated with the growth of spending on innovation.

Second, *public funding significantly more often induces initiation of new projects, while tax incentives are more helpful in launching projects with longer payback period*. This result in its first part is analogous to the relationship revealed in (Guellec, Van Pottelsberghe, 2000) study on EU countries. It is clear that, in view of the way public support mechanisms are organized, usually based on projects' competitive selection under certain conditions, these mechanisms often instigate the need to create a new project (or re-format an existing one). But the fact that it is tax incentives and not public funding that contribute to companies' realization of longer-term projects seemed unexpected and requiring further explanation. We believe that this relationship is not due to special aspects of tax incentives but rather reflects *the undeveloped state of Russian mechanisms of innovation public support, especially regarding the very strict deadlines for supported projects* (usually no more than three years).

3.6. Costs of companies' access to innovation state support and risks of its use: are practitioners always pessimists?

Performance and efficiency of state support mechanisms significantly depend on their main parameters (scale and implementation deadline), terms of access, quality of administration, and ensuing risks of use for companies. In this regard, we shall now look at tax incentives and public funding with a focus on the following group of problems: (1) design faults (ambiguous regulation, unsuitable parameters, discrimination of some company categories), (2) impaired selection procedures (poor information, high bureaucratic costs, unjust winners' determination, and corruption), (3) risks and costs of use (additional inspections and complicated enterprise accounting).

According to descriptive analysis data (Fig. 3), profiles of both tax and fiscal incentives' major problems differ significantly: the use of tax mechanisms is clearly stronger limited by obscure regulation and deficient support parameters (such as the value of benefits), while public funding is more impaired by the complex procedures of obtaining support, overly stringent requirements for recipients (applicants), and insufficient justice of selecting the latter.

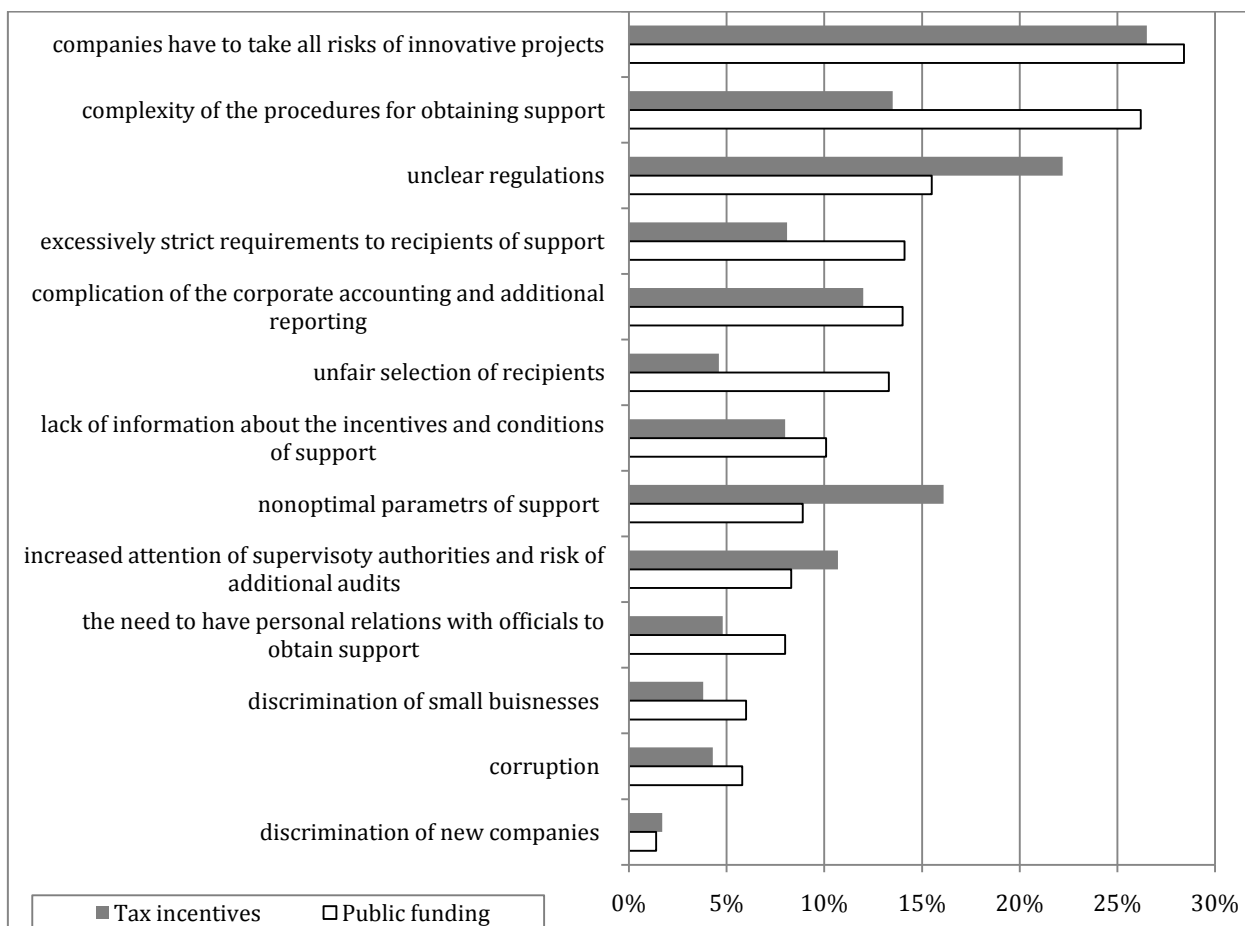


Figure 3. Flaws of tax and financial instruments of innovation state support – frequency of responses

To reveal the deterring and underestimated problems of support mechanisms use, we have used regression analysis where the main explaining variable was the fact whether a company has or has not used a state support mechanism (Table 11 of Appendix). The analysis let us make the following clarifications and additions.

First, our hypothesis that theoreticians are more pessimistic has been partially confirmed. For example, *the problem that all risks of innovative projects implementation have to be faced by an enterprise even when it has state support is regarded as much less important by practitioners, no matter if they used tax or fiscal incentives.* In addition, representatives of companies that did not use financial support were more critical about the vagueness of relevant legislation.

Second, it would be wrong to argue that practitioners are less concerned about all the mentioned problems. On the contrary, they can see even better deficient parameters of tax incentives and excessively stern requirements to the structure of allowed spending when using public funding. *Apparently, practitioners are especially disappointed in limited value of tax benefits and inflexible usage of public funding.*

Third, we have found that the difficulties of support mechanisms usage vary significantly in groups of young and old enterprises. For example, *costs of complicated enterprise accounting are more significant for young companies*, whether using tax benefits or public funding.

While representatives of old companies (more than 20 years old) are less critical to the parameters of tax instruments, they are also less troubled by the problem of overly stringent requirements to potential tax beneficiaries. Therefore, *tax incentives better conform by their design and terms of access to the needs of old business.*

4. Discussion of obtained results

1. Our research sample results have not confirmed our initial hypothesis that innovative activity is the major factor in labor productivity growth: a half of companies whose productivity has increased have had nothing to do with innovation. While innovative enterprises have increased their output thanks to investing more in renewal of their production capacities, the group of non-innovative enterprises achieved the same result by cutting their staff. We suggest that excessive employment has been due to limitations imposed on business during the crisis. Labor costs optimization has become possible for companies after the main phase of the crisis ended.

We can suppose that the remaining narrow circle of innovatively active companies in the post-crisis period is the consequence of former forced limitations to optimize business. When these limitations were eased, companies received other-than-innovation opportunities to maintain their competitiveness – to cut staff in particular. Choosing this path can be also the result of personnel low cost and value for innovatively passive and technologically underdeveloped companies: they do not need special skills; neither they invest much in human capital development.

2. Comparing effects of innovation on supported and not supported companies, we failed to discern any visible signs of 'new quality' of state supported innovation. Undeniably, the availability of support is likely to be associated with accomplishment of some positive innovation results, but we have found significant positive relationship with receiving state

support only in increasing export volume and energy efficiency. However, we have noticed no impact of state support availability or absence on firms' productivity growth.

As we can see, the factor of state support alone is rather neutral for company performance and especially for the efficiency of its innovation – the quality of company's innovation is much more influenced by competitive environment. Enterprises are driven to expand manufacture of new products by growing competition with old Russian firms which, consequently, exhausts their potential to improve traditional products.

3. Sufficiently well-off and exporting companies are likely to become beneficiaries of innovation state support. Obviously, the latter is oriented at the successful companies and is not associated with the help to outsider or, alternatively, insider (partially state-owned) firms. This conclusion, however, does not at all exclude distribution of state support to inefficient firms outside innovation fostering policy.

It might seem quite unexpected that state support more often goes to relatively young companies, but this is the outcome of the existing structure of support mechanisms. Among these, bonus depreciation for investment in new equipment is designed for most massive use; what's more, this incentive is more important for startups intensively building their fixed assets. Active use of tax benefits is to a large extent a consequence of the training effect and competition for the best tax regime with new Russian firms, whereas financial support is more often associated with the growing competitive pressure of import. We believe that the latter trend reflects the authorities' primal concern to preserve jobs and protect interests of domestic producers. These tasks are probably better converted into obtaining financial support from the state than anything else in terms of innovation.

4. Companies' use of state support is largely determined by the established model of their relationship with the state. If the state does not attempt to control business behavior (e. g., demand something from it or restrict it), then the business enjoys significantly less state support of its innovation. It could be argued, of course, that the state curbs provision of support to companies who do not do its assignments, however, it is rather true, judging by a set of attributes, that companies try not to be often put on the spot.

At the same time, we have found no evidence that business would exchange its social responsibility for state support of its innovation. Perhaps, this manifests the desire to increase uniformity and transparency of exchanges in state-business relations.

5. According to our analysis of how support mechanisms affect companies' innovative behavior, the most common effect is the crowding out of private funds by the public spending. Moreover, the effect is typical for both public funding and tax incentives mechanisms. We believe that the demonstration effect of innovation state support is rather weak. Furthermore, innovation is in many cases not a single priority for companies who have had received support, and sometimes it rather serves as a mere pretext to receive additional resources.

As we compared the influence of tax and financial incentives on companies' innovation policy, we found that state financial support brings more results in initiating new projects, whereas application of tax policies has positive correlation with longer-term projects. That the tax incentives rather than public funding contribute to the realization of longer projects is likely a consequence of imperfect design of typical Russian public funding mechanisms, primarily the limited time of project support.

6. Efficiency of innovation state support is significantly impaired by deficiencies of access and risks of use for companies. Sharing risks with the state has been most frequently articulated as most significant problem of state support. This problem has been largely repelling for companies who have not used state support of their innovation; furthermore, it hinders the growth of competition to receive state support.

Companies-recipients of innovation support consider the most critical problem of tax incentives the inadequate benefits' parameters, whereas major drawbacks of public funding for these firms are red tape and complexity of support obtaining procedures. In any case, both the tax and fiscal instruments, due to requirements of additional reporting and complicated accounting, determine higher costs for young start-up businesses. The fact that the design and administration of tax instruments are friendlier to old companies is a natural consequence of that interests of an established business are easier to take into account, it looks more significant to the authorities, and its representatives have better opportunities to influence development and amendment of support mechanisms.

In conclusion, we would like to put forward the following theses for further study and discussion:

(1) presumably, the innovation support system in Russia is oriented at a mature national innovation system, yet the majority of Russian companies demand support of relatively simple innovation pertaining to imitation, acquisition, and adaptation of existing technologies and upgrade of production facilities;

- (2) innovation may be influenced stronger by improvements in institutional environment, especially development of competition, besides, attempts to amend innovation policy apart from the issues of industrial sectors' organization development can significantly impair possible results;
- (3) the choice of an 'ideal' innovation support mechanism is hardly possible: both tax and fiscal mechanisms have their own sets of pros and cons, nevertheless, it is important to actively engage new and young business in support instruments amending discussion;
- (4) efficiency of innovation support mechanisms cannot be evaluated only in the short-term dimension and only in the aspect of volume indicators – it is important to monitor change in companies' behavior, though the latter is quite sensitive to the transparency and predictability of support terms and real distribution of risks.

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Appendix

Table I. Structure of sample

	Percentage of companies, %	
	in the sample of 2012	in the panel (2011-2012)
Age of company		
less than 5 years	10,7	7,7
5-10 years	18,3	18,3
10-20 years	25,3	26,5
over 20 years	45,7	47,5
Industry		
extraction of crude petroleum and natural gas	6,7	6,3
manufacture of food products, including beverages	15,6	17,3
manufacture of textiles and textile products	13,8	13,5
manufacture of wood, wood products, pulp, paper and paper products	11,3	12,5
manufacture of chemicals and chemical products	10,3	10,4
manufacture of rubber and plastic products	6,7	6,8
manufacture of other non-metallic mineral products	6,7	-
manufacture of basic metals	7,5	7,5
manufacture of machinery and equipment	8,0	9,3
manufacture of electrical machinery and equipment	6,1	8,0
manufacture of transport equipment	7,1	8,4
Number of employees		
up to 250 employees	22,1	18,1
251-500 employees	27,8	30,1
501-1000 employees	18,5	19,8
over 1,000 employees	15,8	17,6
up to 250 employees	15,8	14,4
Annual revenue		
not more than 100 million roubles	20,9	14,3
more than 100 million roubles, but not more than 500 million roubles	25,2	28,3
more than 500 million roubles, no more than 1 billion roubles	19,0	21,0
more than 1 billion roubles, but not more than 5 billion roubles	24,5	27,5
more than 5 billion roubles	10,1	9,0
Ownership		
participation of foreign owners	18,9	21,9
participation of foreign owners more than 10%	13,8	9,2
participation of government and / or municipalities	10,7	9,6
Exporting		
to the former Soviet Union (FSU) countries	48,2	54,0
to other countries	28,2	33,9
Financial condition		
poor	11,0	9,4
satisfactory	65,2	64,9
good	23,3	25,7
N	652	415

Table II. Interrelation between productivity growth and innovation activity (on panel sample)

Subgroups	Firms that achieved productivity growth	Panel sample
Non-innovative firms	44,7%	41,6%
1.1 which have not innovated ever in the past	41,3%	35,8%
1.2 which ceased innovating in last 3 years	3,4%	5,8%
Innovative firms	55,3%	58,4%
2.1 which have innovated earlier	16,2%	42,1%
2.2 which began to innovate in last 3 years	39,1%	16,3%
TOTAL:	100,0%	100,0%
N	179	413

Table III. Labor productivity growth of companies – results of binary logistic regression parameters estimation

		Productivity growth of non-innovative companies		Productivity growth of innovative companies	
		Model 1	Model 2	Model 1	Model 2
Age of company	less than 5 years				
	over 20 years				
Number of employees	up to 100	-0,634*	0,721*	-0,871*	
	101-250	1,394**	0,842*	1,211***	1,054**
	501-1000				
	over 1000			-1,882***	-1,218**
	downsizing		0,970**		
Ownership	participation of government				
	no foreign owners		-0,622*		
Technological level	high				
	low	1,096*			
Financial condition	good	-0,905*	-1,113*		
	poor				
Competition with Russian firms	no				
	tough				
	lessening				
	intensification				-0,897*
Competition with foreign firms	no				
	tough				
	lessening				1,506**
	intensification				-0,136
Revenue	under \$15 million				
	over \$200 million				
	increase		0,739*		2,230***
Fixed capital expenditure	under 1%	-0,892*	-0,975*		
	over 5%				
	increase				0,965**
TPP innovation expenditures	under 1%				
	over 5%				
	increase				
Industry dummies		yes			
Constant		2,971	23,777	4,937	-0,389
N		415	415	415	415
R ² (Nagelkerke)		0,21	0,28	0,23	0,32

Hereinafter:

* significant at 0,01 level

** significant at 0,05 level

*** significant at 0,01 level

Table IV Performance indicators increased due to innovations – results of binary logistic regression parameters estimation (for innovative companies subsample)

	revenue	output of new or improved products	exports	profitability	labor productivity	material consumption	energy consumption	environmental compatibility	no indicators improved
Receiving state support in last 3 years			1,108**				,631*		-1,854*
Age of company	less than 5 years						1,360**	1,663**	
	over 20 years					-1,107***	,855**	1,442***	
Number of employees	up to 100	,832**							
	101-250	,861**				-1,179**			
	501-1000	,968***	1,391***						
	over 1000	,756*			1,016***	1,215**	1,034*		
Ownership	participation of government			-823*					
	no foreign owners								
	over 10% of foreign owners								
Financial condition	poor	-,859*				,989*			3,076***
	good								
Worker efficiency	low	-,882***		,649**	,577**				
	high			,561*			1,091**		-2,135*
Competition with Russian firms	no								
	tough			-,593*					
Competition with foreign firms	no	-,779**							
	tough	-,677**							
Intensification of competition	with old Russian firms		1,097***				,952**		
	with new Russian firms					-,873*			
	with Russian divisions of MNC			-2,628**					
	with import							1,636***	
Export	no		-3,090***						
	to far abroad countries							1,051*	
Industry dummies	yes								
Constant	,295	-1,133	-,147	-1,444*	-1,649**	-2,241**	-5,359***	-4,822***	-7,097***
N	391	391	391	391	391	391	391	391	391
R ² (Nagelkerke)	,178	,191	,363	,150	,166	,238	,243	,341	,520

Table V. State support for innovation regarding company's size, age, financial condition and innovation activity

	Companies that have obtained public support	incl. ones that in last 3 years	
		have used tax incentives	have received public funding
Total	24,2%	17,5%	8,6%
<i>Number of employees</i>			
up to 100 employees	18,1%	11,8%	4,9%
101-250 employees	13,8%	8,3%	5,0%
251-500 employees	29,8%	22,3%	9,1%
501-1000 employees	31,1%	27,2%	6,8%
over 1000 employees	37,9%	26,2%	21,4%
<i>Age of company</i>			
less than 5 years	30,0%	24,3%	5,7%
5- 10 years	26,9%	22,7%	6,7%
10-20 years	21,8%	17,6%	7,9%
over 20 years	23,2%	13,8%	10,4%
<i>Financial conditions</i>			
poor	2,8%	2,8%	0,0%
satisfactory	22,8%	14,8%	7,3%
good	38,2%	31,6%	16,4%
<i>Innovations in last 3 years</i>			
non-innovative	3,5%	3,1%	0,0%
innovative	37,9%	27,0%	14,2%
incl.			
ones that have started innovating recently	27,3%	21,2%	10,1%
ones that are continuous innovators	42,5%	28,7%	16,5%

Table VI. Obtaining of state support for innovation in last 3 years – results of binary logistic regression parameters estimation (for innovative companies subsample)

		Obtaining of public support	Use of tax incentives	Obtaining of public funding
Age of company	less than 5 years	1,076**	,986*	
	over 20 years		-,853**	
Number of employees	up to 100			
	101-250			
	501-1000			
	over 1000			
Ownership	participation of government			
	no foreign owners			
	over 10% of foreign owners			
Financial condition	poor	-2,316**	-1,341**	
	good	,511*	,771*	1,049*
Worker efficiency	low			
	high			
Competition with Russian firms	no			
	tough			
Competition with foreign firms	no		,726*	
	tough			
Intensification of competition	with old Russian firms			
	with new Russian firms	,629*	1,117***	
	with Russian divisions of MNC			-1,174**
	with import	,707*		,806*
Export	no	-1,006***	-1,610***	
	to far abroad countries	,691*		,982*
Industry dummies		yes		
Constant			-,039	-3,478***
N			391	391
R ² (Nagelkerke)			,389	,229

Table VII. Models of the business-state interaction at the federal level

Модели отношений	Direct state intervention	Priority of preferences	Percentage of companies
1. State considers business as an equal partner; attracting investments and improvement of business conditions are authorities' main priorities	No	Business	9%
2. State does not hamper the development of business but considers it as a junior partner and aims to hold the keys of corporate actions	Yes	Business and Government	16%
3. State focuses on companies' social responsibility but does not intervene in any other matters	Yes	Government and Society	14%
4. Authorities main concern is entrepreneurship political loyalty	Yes	Government	6%
5. Business is considered as a source of income only	No	Government	29%
6. Government non-interference with business except for law enforcement	No	-	40%

Table VIII. Obtaining of public support regarding model of business-state interaction – results of binary logistic regression parameters estimation

		Obtainung of public support	Use of tax incentives	Obtaining of public funding
Models of the business-state interaction	partners			
	strategic control			
	social responsibility	-0,766*		-1,087*
	political loyalty	1,213**	0,970**	
	source of income	-1,362***		-1,208**
	noninterference	-1,879***	-1,258***	-1,618***
Control dummies		See Table IV*		
Constant				-1,655**
N				
R ² (Nagelkerke)				

*) While processing binary logistic regression parameters estimation, the following variables were controlled: industry, age, size, ownership, financial condition, productivity level, competition and its dynamics, and exports.

Table IX. Changes in companies' innovation activities due to public support – results of binary logistic regression parameters estimation (on subsample of companies, which have received public support in last 3 years)

	New promising innovative project has been launched	Implementation of more valuable projects	Implementation of projects with longer payback period	Decrease in risks of innovation	Redirecting of company's finances to other activities
Use of tax incentives in last 3 years			1,522*		
Obtaining of public funding in last 3years	1,891**				
Age of company					
less than 5 years					
over 20 years					1,293**
Number of employees					
up to 100				2,380*	
101-250			-2,321*		
501-1000					1,443*
over 1000		-2,073*		-3,661**	
Ownership					
participation of government		4,378**		3,164*	
no foreign owners	2,475**				
over 10% of foreign owners					
Financial condition					
poor			-1,394*		-1,510***
good					
Worker efficiency					
low		2,025*			
high			-2,500**		
Competition with Russian firms					
no				-4,088**	
tough					
Competition with foreign firms					
no					
tough					
Intensification of competition					
with old Russian firms			2,762**	2,271*	
with new Russian firms					,982*
Industry, financial condition and exports dummies	yes				
Constant	-6,390***	,136	-2,599	-4,182*	-2,264
N	156	156	156	156	156
R ² (Nagelkerke)	,338	,388	,433	,526	,340

Table X. Disadvantages of tax incentives and public funding

	Disadvantages of tax incentives		Disadvantages of public funding	
	Companies that have NOT used tax incentives	Companies that have received public funding	Companies that have NOT received public funding	Companies that have received public funding
Complexity of procedures for obtaining support	14,9%	7,0%	25,0%	39,3%
Excessively strict requirements to recipients of support	8,4%	7,0%	12,8%	28,6%
Complication if the corporate accounting and additional reporting	13,0%	7,0%	13,6%	17,9%
Unfair selection of recipients	5,2%	1,8%	13,1%	16,1%
Nonoptimal parameters of support (value of tax benefits, timing and amount of financing, etc.)	11,5%	37,7%	8,7%	10,7%
Companies have to take all risks of innovative projects	29,6%	12,3%	30,2%	8,9%
Lack of information about the incentives and conditions of the support	8,9%	3,5%	10,2%	8,9%
Increased attention of supervisory authorities and risk of additional audits	11,2%	8,8%	8,2%	8,9%
Unclear regulations	21,7%	24,6%	16,4%	5,4%
Corruption of officials	4,5%	3,5%	6,0%	3,6%
The need to have personal relation with officials to obtain support	5,2%	2,6%	8,6%	1,8%
Discrimination of small businesses in getting support	4,1%	2,6%	6,4%	1,8%
Discrimination of new companies in getting support	1,9%	0,9%	1,5%	0,0%
N	538	114	596	56

Table XI. Disadvantages and problems of (A) tax incentives; (B) public funding – results of binary logistic regression parameters estimation

	Unclear regulations	Nonoptimal parameters of support	Excessively strict requirements to recipients of support	Complexity of procedures for obtaining support	Unfair selection of recipients	Lack of information about the incentives and conditions of support	Complication of the corporate accounting and additional reporting	Companies have to take all risks of innovative projects
Use of tax incentives in last 3 years		1,378***				-1,001*		-0,730**
Age of company							1,620***	0,597*
up to 5 years								
over 20 years		-0,937***	-0,855**					
Control dummies	See Table IV*							
Constant	-2,05***	0,367	-0,406	-0,470	-3,030***	-1,576	-3,878***	-2,441***
N	647	647	647	647	647	647	647	647
R ² (Nagelkerke)	,102	,268	,169	,112	,124	,106	,160	,189

Obtaining of public funding in last 3 years	-1,247*		0,906**					-1,269**
Age of company							1,929***	
up to 5 years								
over 20 years				0,424*				
Control dummies	See Table IV*							
Constant	-2,379**	-1,094	-1,028	-0,989	-3,362**	-1,381	-3,564***	-2,943***
N	647	647	647	647	647	647	647	647
R ² (Nagelkerke)	,164	,113	,169	,181	,182	,116	,295	,198

*) While processing binary logistic regression parameters estimation, the following variables were controlled: industry, size, ownership, financial condition, productivity level, competition and its dynamics, exports, and changes in innovation activity within last 3 years.