

# Fostering Industrial Innovation: Russian Evidence

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# Main Issues

- 1) Background on the Russian STI policy**
- 2) Methodological approach: tasks for study, initial propositions, and empirical base**
- 3) Discussion of empirical results**
- 4) Lessons for the future**

**The main purpose is to consider key instruments of Russian innovation policy and their impact on companies in the post-crisis period**

# The Peculiarities of the Russian STI Policy in Post-Crisis Period

- In recent years the Russian innovation policy has made a significant progress, its 'tool kit' has been considerably developed
- Now a feature of the Russian STI policy is the growing attention to
  - (1) development of cooperation among the major actors of the innovation process,
  - (2) support of networks and partnerships,
  - (3) fostering of universities' research activity
- A lot of experiments in the Russian innovation policy have been carried out, but the learning process is very weak
- Budget constrains make it necessary to search for the most effective instruments for STI policy, but the Russian evaluation system isn't comprehensive

# Selected indicators of Innovation Activity in Russia, 2006-2012

	2006	2007	2008	2009	2010	2011	2012
Gross domestic expenditure on R&D (GERD) as a percentage of GDP	1.07	1.12	1.04	1.25	1.13	1.09	1,12
Estimated Civil GERD as a percentage of GDP	0.36	0.40	0.39	0.56	0.53	0.58	-
Percentage of GERD financed by government	61.1	62.6	64.7	66.5	70.3	67.1	-
Percentage of GERD financed by industry	28.8	29.4	28.7	26.6	25.5	27.7	-
Enterprises engaged in technological innovation as a percentage of enterprises total	9.4	9.4	9.6	9.4	9.3	9.6	9,9
Expenditure on technological innovation as a percentage of total sales	1.4	1.2	1.4	1.9	1.5	1.5	1.8
Innovative goods and services a percentage of total sales	5.5	5.5	5.1	4.6	4.9	6.1	7.0

*Sources:* HSE. (2012). Science. Innovations. Information-oriented Society: 2012. Higher School of Economics, Moscow; 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. [www.gks.ru](http://www.gks.ru)

**For the last few years, some indicators have been increasing, but we do not know exactly if it is due to SMEs or big (state controlled) businesses**

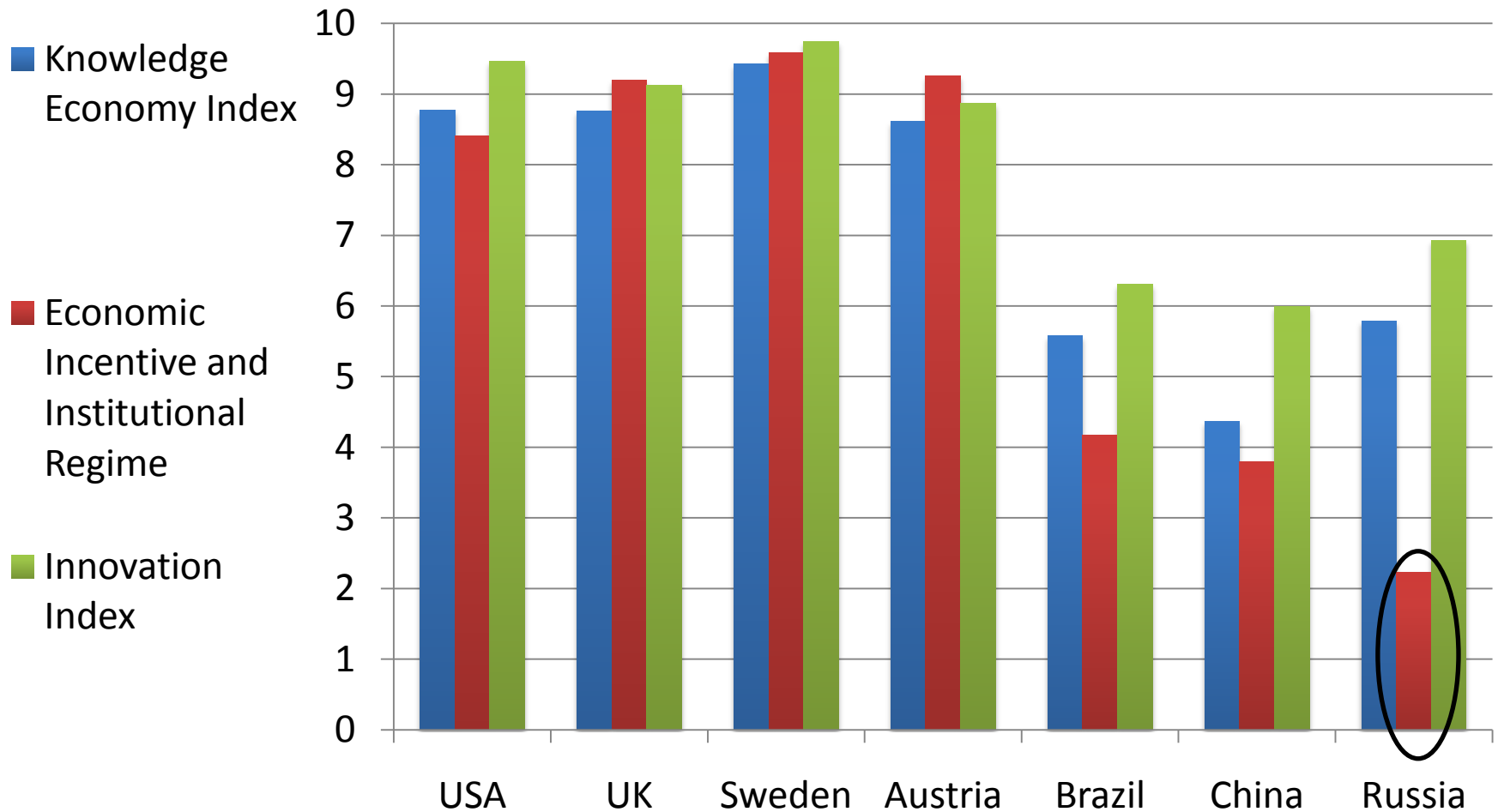
# Selected Indicators of the Development of Russian Innovation System, 2010

Indicator	USA	UK	Sweden	Austria	Brazil	China	Russia
Private Sector Spending on R&D	5.4	4.6	6.0	4.3	3.8	4.1	3.2
Value Chain Presence	5.1	5.3	6.2	5.7	3.7	4.0	3.0
Availability of Venture Capital	3.8	3.0	4.0	2.9	2.6	3.3	2.3
Intellectual Property Protection	5.1	5.5	6.2	5.7	3.1	4.0	2.6
University-Company Research Collaborations	5.8	5.6	5.5	4.9	4.3	4.6	3.7

Source: On the basis of Knowledge Economy Index, World Bank (data for 2010) [http://info.worldbank.org/etools/kam2/KAM\\_page3.asp](http://info.worldbank.org/etools/kam2/KAM_page3.asp)

**One of the greatest problems is low level of private sector R&D spendings**

# Aggregate innovation indicators: comparisons



Source: On the basis of Knowledge Economy Index, World Bank [http://info.worldbank.org/etools/kam2/KAM\\_page5.asp](http://info.worldbank.org/etools/kam2/KAM_page5.asp)

The position of Russia in knowledge economy and innovation are not too weak, but there are heavy problems concerning incentives and institutional regime

# Comparison of Major Achievements and Problems of Russian Innovation Policy in 2007-2011

## 1. Pre-crisis Period: 2007-2008

- |  |   |
|--|---|
| <ul style="list-style-type: none"><li>• huge budget recourses</li><li>• increasing investment activity of the state</li><li>• growing budget allocations to innovation</li><li>• adoption of long-term strategies, science and technology 'target programs'</li><li>• tax incentives for innovation</li><li>• establishment of big venture funds</li></ul> | <ul style="list-style-type: none"><li>• stable conditions for business, a reduction of tax burden</li><li>• risks of takeovers and discourage for expanding the scale of business activity</li><li>• mainly the adaptive innovation model; small R&amp;D spending</li><li>• small number of really innovative companies</li></ul> |
|--|---|

**Major constraints: large-scale application of rough direct innovation policy tools, rise of strong distortions in the market environment**

# Comparison of Major Achievements and Problems of Russian Innovation Policy in 2007-2011

## *2. Crisis phase: 2009-2010*

- |   |  |
|---|--|
| <ul style="list-style-type: none"><li>• dramatic budget curtailment;</li><li>• countercyclical policy;</li><li>• temporary protection policy, domestic demand promotion;</li><li>• selective support of big companies;</li><li>• establishment of state committees on modernization;</li><li>• setting modernization priorities</li></ul> | <ul style="list-style-type: none"><li>• hard financial constraints for companies;</li><li>• dramatic decline in the predictability of business environment conditions;</li><li>• innovations are concentrated in the big businesses;</li><li>• business is interested in costs reduction</li></ul> |
|---|--|

**Major constraints: 'confiscation' of potential advantages from innovatively-active companies due to the state policy's focus on social stability in the prejudice of economic performance**



# Comparison of Major Achievements and Problems of Russian Innovation Policy in 2007-2011

## *3. Post-crisis phase: 2011 -2012*

- |  |  |
|--|--|
| <ul style="list-style-type: none"><li>• considerable budget constraints; welfare-oriented budget;</li><li>• innovation is one of government policy's priorities; significant alterations to regulation;</li><li>• new innovation promotion instruments, but still in weak business environment;</li><li>• multiple 'experiments with no consequences' and learning projects;</li></ul> | <ul style="list-style-type: none"><li>• uncertainty, low predictability of business environment;</li><li>• multiple 'innovation signals' from the state;</li><li>• businesses wait and focus on completing their current projects;</li><li>• imitation of innovation activity as a type of rent-seeking behavior;</li><li>• increasing importance of the task of creation new products</li></ul> |
|--|--|

**Major constraints: uncertainty of economic conditions; postponement of key economic decisions by the state; considerable slowdown in the institutional development of business environment**

# Main Tasks for Study

- I. Increase in productivity of Russian companies in the post-crisis period – mainly due to innovation or not ?
- II. Role of the government support for industrial innovation in Russia – significant or not ?
- III. Who are the beneficiaries of the public support for innovation?
- IV. Tax incentives and public financing: how do they impact on companies' innovation?
- V. What are main problems of implementation of Russian innovation policy instruments?

# Empirical Data

## 2 questionnaire surveys of top managers of Russian industrial companies

2011 - 602 companies; 2012 - 652 companies

	Percentage of companies, %	
	2011	2012
<b>Age of company</b>		
less than 5 years	9,0	10,7
5-10 years	18,6	18,3
10-20 years	24,6	25,3
over 20 years	47,8	45,7
<b>Industry</b>		
extraction of crude petroleum and natural gas	6,5	6,7
manufacture of food products, including beverages	16,7	15,6
manufacture of textiles and textile products	13,1	13,8
manufacture of wood, wood products, pulp, paper and paper products	13,3	11,3
manufacture of chemicals and chemical products	11,0	10,3
manufacture of rubber and plastic products	7,6	6,7
manufacture of other non-metallic mineral products	-	6,7
manufacture of basic metals	8,1	7,5
manufacture of machinery and equipment	9,1	8,0
manufacture of electrical machinery and equipment	6,6	6,1
manufacture of transport equipment	8,0	7,1

	Percentage of companies, %	
	2011	2012
<b>Number of employees</b>		
up to 250 people	35,8	49,8
251-500 people	28,1	18,6
501-1000 people	18,8	15,8
over 1000 people	17,3	15,8
<b>Ownership</b>		
participation of foreign owners	21,4	18,9
of which more than 10%	15,3	13,8
participation of government and/or municipalities	11,1	10,7
<b>Exporting</b>		
to the former Soviet Union (FSU) countries	49,8	48,2
to other countries	29,5	28,2
<b>Financial condition</b>		
poor	14,5	11,0
satisfactory	65,7	65,2
good	19,8	23,3

# Propositions for Testing

- 1. Most Russian companies, which recently have increased their productivity, do innovate actively. The growth of the performance of companies is connected with their investments in new equipment**
- 2. Companies innovating without public support are more successful in improving their efficiency (productivity, profitability, etc.). Public support for innovation contributes mainly to increasing basic 'direct' indicators of companies' performance (revenue, production, exports)**
- 3. Public support for innovation is more often given to: (1) large companies, (2) companies where the government is a shareholder**
- 4. As compared with tax incentives public financing is more conducive to a decrease of risks and launch of new projects, but it also more often leads to crowding out private financing**
- 5. The perception of problems and risks of innovation support policies that prevails in the business environment tend to be more negative than real situation**

# Productivity Growth and Innovations: Initial Proposition

1. In general, companies' innovation activities have a positive influence on their performance
2. The imitation model of innovations is of big importance for technologically underdeveloped companies in Russia
3. Mukoyama, 2002 – learning from imitation is important
4. Mckinsey Global Institute, 2009 – adoption of technologies can significantly improve productivity of Russian companies
5. Giannangeli, Gomez-Salvador, 2008 – European firms are highly heterogeneous in terms of their productivity both among different industries and within the same industry
6. Bessonov et al, 2009 – a lack of 'jobs circulation' is the major obstacle for reducing the difference in the level of performance of Russian companies
7. Simachev, Kuzyk, 2012 – during the crisis, the opportunities of companies to cut jobs were restricted (mainly due to the pressure of Russian authorities)

***Proposition # 1. Most Russian companies, which recently have increased their productivity, do innovate actively. The growth of the performance of companies is connected with their investments in new equipment***

# Growth of Companies' Productivity: Two Different Models

20% companies in the panel increased their productivity in 2011-2012



	11% - innovative	9% - without innovation activities	
'Age' of company	++ less than 5 years		+++ / - - - significant at 1% level
Size (number of employees)	++ up to 250 people		
Technological level		+ low	++ / - - significant at 5% level
Competition		- with domestic firms	
Exporting	++ exporters	- - exporters	+ / - significant at 10% level

**Innovative group:** young small exporting companies; they are often characterized by growth of revenues and investment in fixed assets

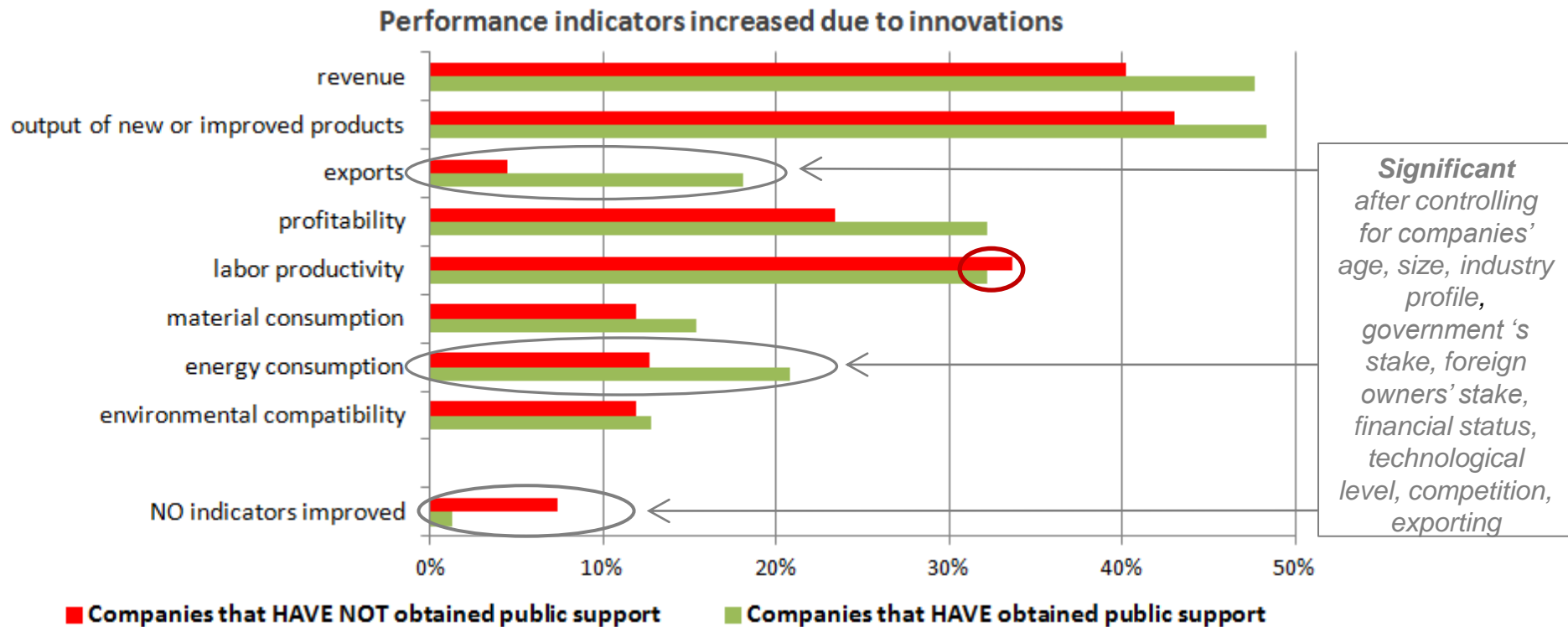
**Non-innovative group:** technologically underdeveloped firms without exports, that often have reduced their staffs

# Value of Public Support for Innovation: Proposition

1. OECD, 2011; Goldberg et al, 2011 – public support for innovations can be fruitful for companies, but it also can cause significant distortions and imbalances
2. Frye, 2002 – receiving public support has its costs and risks, so successful companies could prefer to innovate without getting support
3. David, Hall, Toole, 2000 – there is a risk of rent-seeking behavior of companies being supported by the government
4. Under conditions of information asymmetry the government faces difficulties in assessing the effectiveness of incentives and has to focus on the most transparent and observable indicators, such as new production or exports

***Proposition # 2. Companies innovating without public support are more successful in improving their efficiency (productivity, profitability, etc.). Public support for innovation contributes mainly to increasing basic 'direct' indicators of companies' performance (revenue, production, exports)***

# Public Support for Innovation: Is There a New Quality?



Getting public support generally contributes to improving companies' performance (first of all, their exports and energy consumption), but it does not really affect labour productivity.



# Beneficiaries of Public Support for Innovation: Proposition

1. Fier, Heneric, 2005; Aschhoff, 2010 – there is a positive relationship between the size of companies and their chances to get public support
2. Garcia, Mohnen, 2010 – significant proportion of large companies among recipients of public support shows tendency of the government to avoid risks
3. Large companies innovate more often, so focus on supporting large firms provides a pseudo-positive result, which is important for reporting
4. Simachev et al, 2010 – concentration of employment in large and strategic Russian enterprises forces the government to pay more attention to them
5. Giving support to state-owned companies makes it easier for the government to control its use and provides additional opportunities for solving public problems

**Proposition # 3. *Public support for innovation is more often given to:***  
***(1) large companies, (2) companies where the government is a shareholder***

# Beneficiaries of Public Support for Innovation: Empirical Observations

	any kind of public support	tax incentives	public funding
'Age' of company	+++ less than 5 years	++ less than 5 years -- over 20 years	
Size (number of employees)	-- 101-250 people		+ over 1000 people
Shareholders	- government	- government	
Technological level	- low		
Financial status	--- pour + good	-- pour ++ good	+++ good
Competition		++ no with foreign firms	++ tough with foreign firms
Key customers			+ government
Exporting	--- no +++ to far abroad countries	--- no +++ to far abroad countries	+ to far abroad countries

We have not detected a significant bias of innovation policy in whole towards big companies (it is characteristic only of public funding), but there is a certain 'gap' in supporting medium-sized firms

Getting public support for innovation is more typical of companies in good financial condition and exporters to far abroad countries, and less characteristic of technologically underdeveloped firms and companies without exports

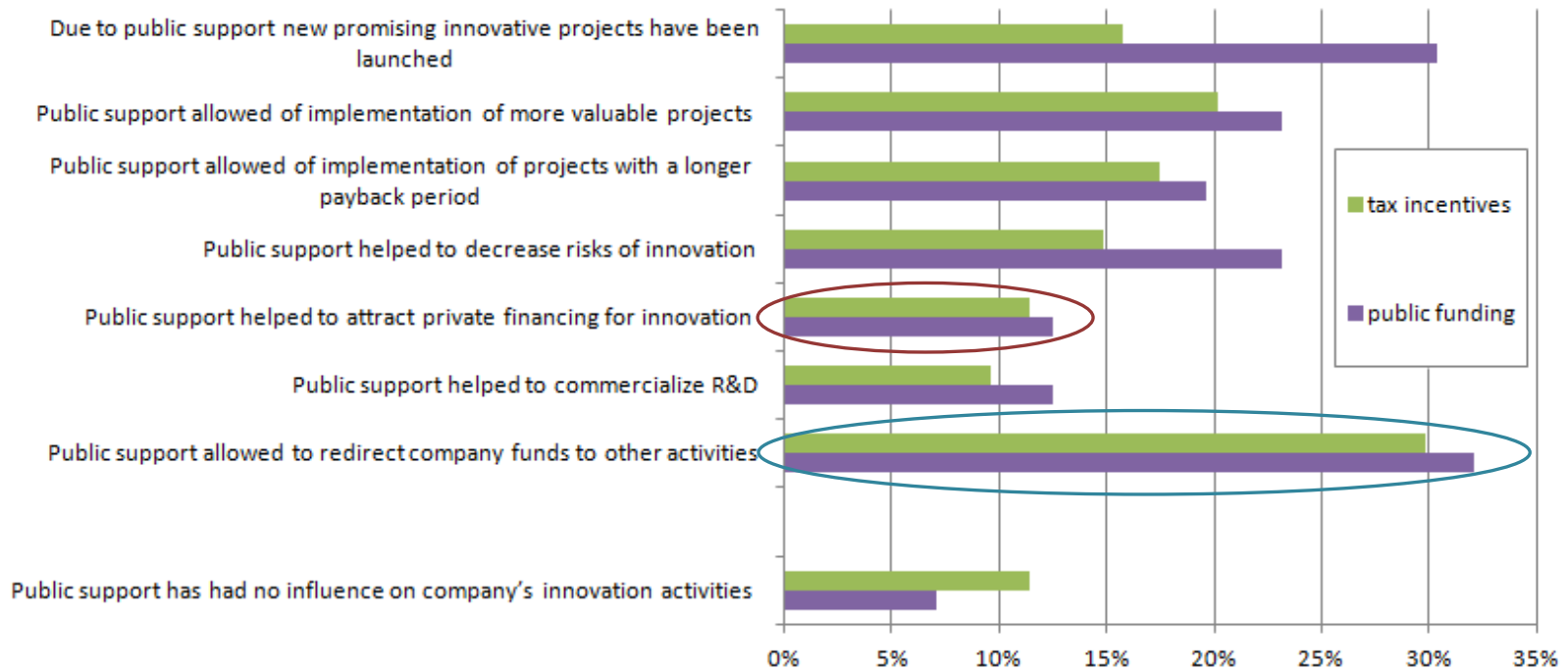
# **Influence of Tax Incentives and Public Funding Instruments on Companies' Innovations: Proposition**

1. Guellec, Van Pottlesberghe, 2003; Jaumotte, Pain, 2005 – state subsidies have more prolonged effects than tax incentives which primarily stimulate investment in existing projects
2. Berube, Mohnen, 2007 – beneficiaries of financial support more often innovate internationally and succeed in the commercialization than companies that benefit from tax incentives only
3. Klette et al, 2000; Wallsten, 2000; Lach, 2002 – as a result of public support private financing can be substituted by state subsidies
4. David, Hall, Toole, 2000 – in order to demonstrate high efficiency of public financing, authorities prefer to support reliable projects that would have been implemented without any external assistance

***Proposition # 4. As compared with tax incentives public financing is more conducive to a decrease of risks and launch of new projects, but it also more often leads to crowding out private financing***

# Effects of Tax Incentives and Public Financing on companies innovation

## Changes in companies' innovation activities due to public support



The most common effect of public support consists in redirecting of some funds to other lines of companies' development, while rising finance from private investors is among the rarest results – in case of public funding it could be considered as a sign of the crowding out effect

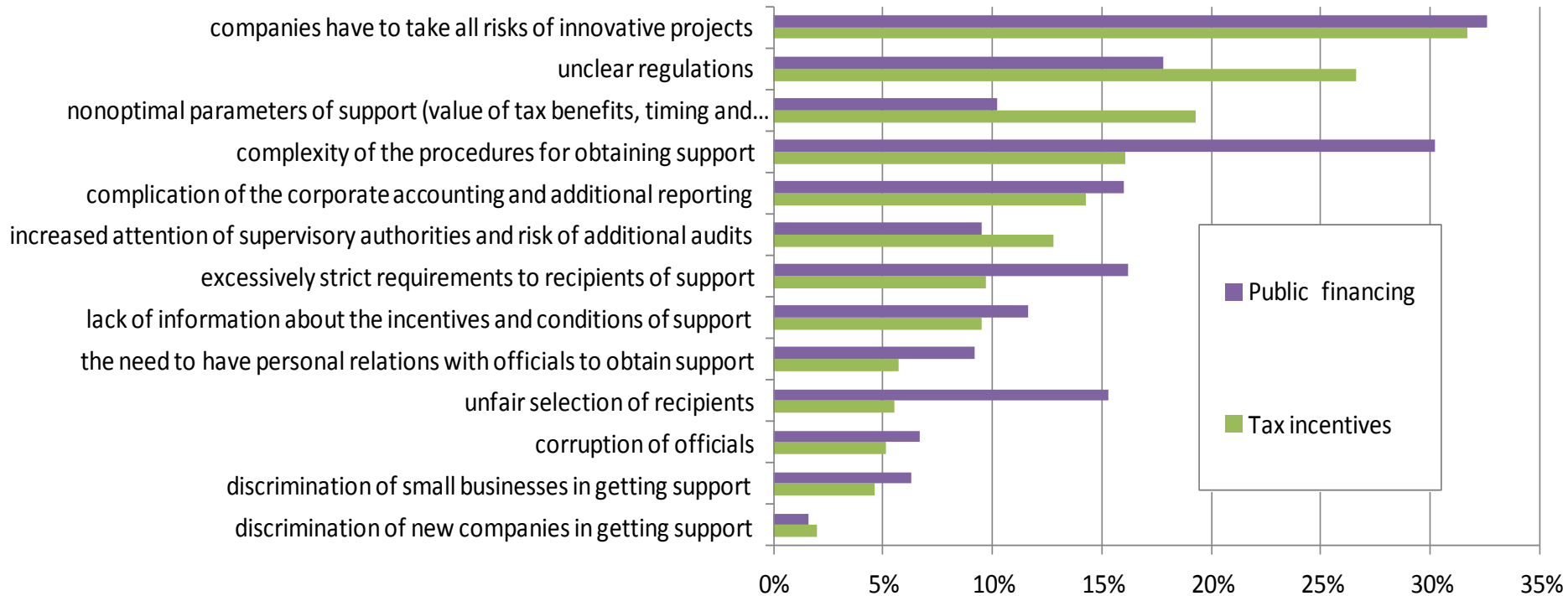
Additional analysis shows that public funding is more likely to lead to launch of new innovative projects, whereas tax incentives are more conducive to innovations with a longer payback period

# Issues of Companies' Access to the Innovation Policies and Risks of their Application: Proposition

1. Contractors' demand of innovation state support may become considerably limited by a distorted perception of real problems
2. Golikova et al., 2003 – analysis of company demand for corporate management reveals the effects of pessimistic approach to a situation (when evaluation of theoreticians is worse than that of practitioners) in the fields of legal regulation
3. D'Este et al., 2008 –detering and revealed barriers
4. In Russia, the problem of distorting the picture of the real problem is especially painful due to the underdevelopment of civil society institutions and limited opportunities to receive independent expert evaluation

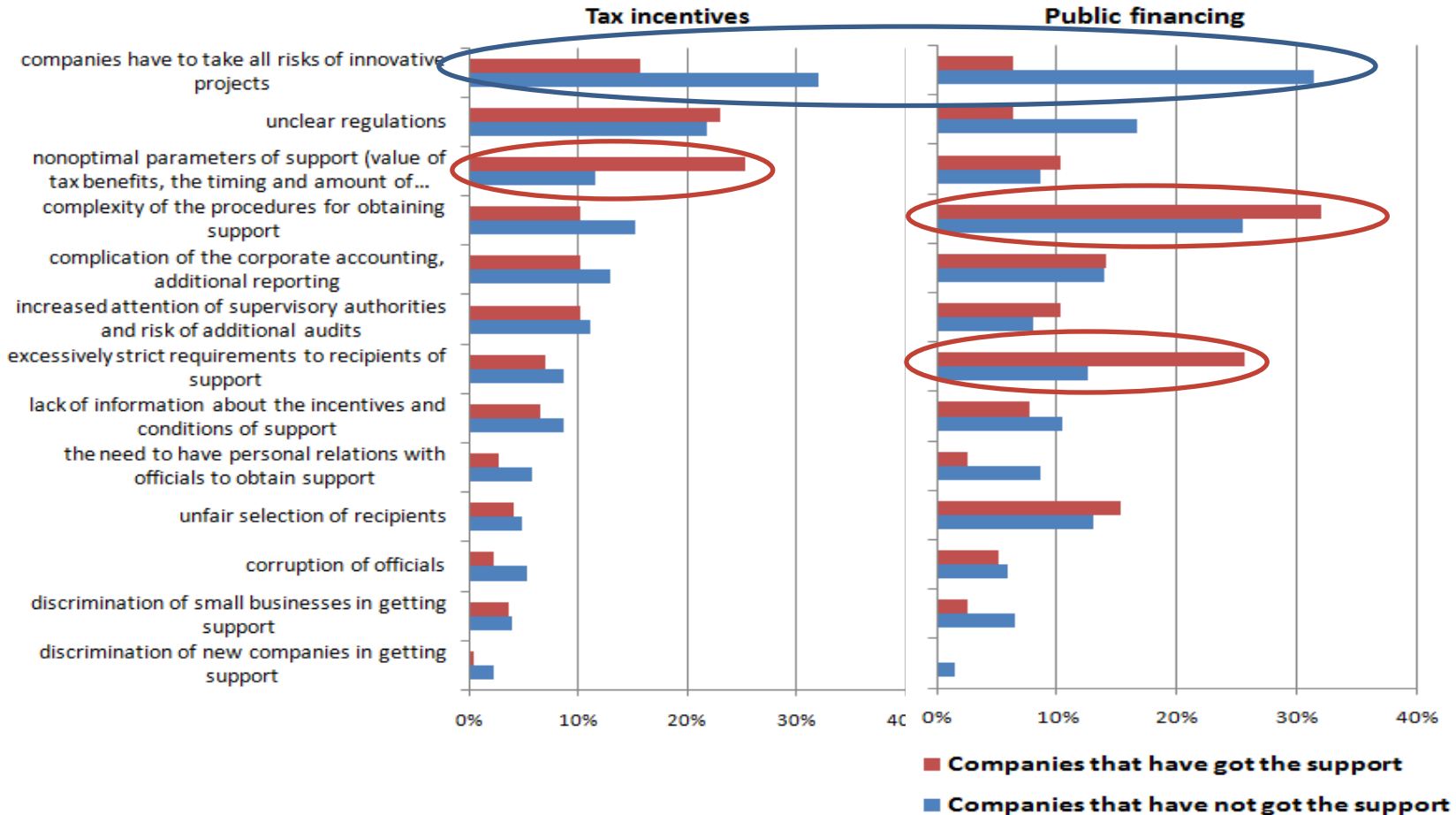
**Proposition # 5. The perception of problems and risks of innovation support policies that prevails in the business environment tend to be more negative than real situation**

# Disadvantages and Problems of the Innovation Policy Instruments



- The key problem for both kinds of instruments is that there is a lack of risk sharing
- The problems of unclear regulations and non-optimal support parameters are more typical of tax incentives, whereas the problems of procedures' complexity and excessively strict requirements are more substantial for public financing

# 'Theoretical' and 'Practical' Views of the Problems



Assessments of problems differ significantly depending on whether the companies have got the support or not. 'Theorists' are excessively pessimistic, especially in their assessment of insufficient risk sharing.

'Users' pay more attention to non-optimal parameters of tax incentives, too complex procedures of getting public financing, excessively strict requirements to its recipients

# Results and Discussion (1)

## **1. Half of the companies who have increased their labor productivity have nothing to do with innovations**

**Innovative companies: investment into renovation of production capacities**

**Non-innovative companies: staff reduction (post-crisis optimization)**

## **2. The factor of state support is of no consequence for a firm's efficiency**

**Enterprises' innovation behaviour is rather more influenced by competition terms**



## Results and Discussion (2)

### **3. Innovation policy is oriented at the well-to-do and 'young' companies (not 'outsider' firms or those with partial state ownership)**

However, ineffective businesses might be supported outside the innovation-fostering tools

**Tax incentives: the effect of competition with new Russian firms for the most favorable tax regime**

**Public funding: increasing competitive pressure of import**

**Pressure of import is the reason for public policy of jobs preservation and protecting interests of national producers**

## Results and Discussion (3)

### 4. Crowding out effect for both public financing and tax incentives (weak demonstration effect)

Financial support: launching new innovation projects

Tax incentives: increase in the duration of existing projects

A sequence of the poor design of Russian public funding tools, first of all, the limited terms of project support

### 5. The most significant problem of state support: insufficient risk sharing (detering effect)

For 'users':


Financial support: red tape and complexity of the procedure

Tax incentives: non-optimality of support parameters

Both tools cause greater expenses for 'young' companies  
(the requirements of additional paperwork and complicated reporting)

Tax policy is more friendly to older companies  
(lobbying and connections with authorities)


# Lessons for Policy (1)


**Lack of analysis of behavioral additionality  even efficient policy tools sometimes look less advantageous**

**The desire of officials to declare rapid achievements  the risk of imitating positive results**

**The evaluation of best practice is needed!**


## Lessons for Policy (2)

**There is no 'universally useful' innovation policy tool  a new tool should first be applied neutrally and on a sufficiently broad scale in order to identify its real industry specificity and possible market failures**

**Counterbalancing the problems of business environment directly by boosting the stimuli for innovation  rent-seeking behaviour and imitating the innovations**

**In order to develop an innovation-friendly regulation, the state has to share the risks with businesses and be ready to lose some of its resources**

## Lessons for Policy (3)

An excessive search for 'market failures' and the ways to compensate them  inevitable 'government failures'

Obstacles to innovation development of Russian economy are not connected directly to innovation policy  reduction of the demonstration effects of successful innovative companies