

BRANCH-WISE AND REGIONAL ECONOMY

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The factors of innovation activity of St. Petersburg industrial enterprises

The paper provides an analysis of innovation activity of manufacturing industries of the city of St. Petersburg. Relying on statistical and accounting data, the authors try to explain the cause-and-effect relationships in forming the innovative activity of these enterprises and to identify the problems of their innovation development. The particular emphasis is placed on evaluating the results of innovative activities of enterprises in recent years.

Innovative activity; R&D, industry, revenue, net profit, number of employees, sources of funding; competitiveness.



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The development of innovation component in industrial enterprises activity is a key point in the strategy and tactics of management of the region economy. Developing the measures to create the conditions for solving this problem may be preceded by the identification of factors that promote or, on the contrary, hamper the innovative development of industrial enterprises.

The following factors that generally determine the bulk of investment in innovation at the enterprise were accepted as the analyzed factors: the gross revenue, net profit, the size of the company (average employee number), loan funds.

To identify and to estimate the factors of innovation activity the following tasks were formulated:

- to determine the range of the analyzed companies in leading industries of the city and the dynamics of their investment in R&D in 2007 – 2009;
- to analyze the impact of the factor of the volume of economic exchange and profits on innovation;
 - to identify the influence of industry sector of the enterprise on their innovation activity;
 - to assess the impact of enterprise's participation in various state and regional programs on the parameters under study;
 - to analyze the impact of the banking sector on industrial policy of the enterprise;
 - to compare St. Petersburg enterprises with the world leaders in their industries, i.e. to compare the costs for R&D and the technical performance parameters of products.

Qualitative and quantitative assessment of innovation activity of a number of backbone enterprises of St. Petersburg can become the basis for determining business activities of enterprises in St. Petersburg related to the development of innovation, as well as actions of the federal and regional authorities in this field.

St. Petersburg industry: the role of the analyzed companies. The economy of St. Petersburg

is a significant part of the economy of the Russian Federation as a whole. In the analyzed year, 2009, gross regional product (GRP) of St. Petersburg was 1.473 trillion rubles, that is 3.8% of GDP of Russia. Only Moscow, Tyumen and the Moscow oblast take the lead over St. Petersburg by this indicator [1].

The mover of economic development of St. Petersburg is a manufacturing sector (its share in gross regional product – 22.5%) [2]. The same sector is the main arena of R&D: the enterprises for the research were selected out of this sector.

In all 15 enterprises of St. Petersburg were analyzed, they were selected from different core sectors of the city: mechanical engineering (especially power engineering and propulsion engineering), electronics, radio electronics, optical mechanics, pharmaceutical and food industries. These are mostly large enterprises leading in their form of economic activity.

Investments of St. Petersburg enterprises in R&D. The data on the enterprises were collected mainly by using their open accounting (most of the companies are joint stock companies). There was an attempt to establish the movement of indicators in 2007 – 2009 (tab. 1).

Table 1. Investment of St. Petersburg enterprises in R&D, thousand roubles

Enterprise	Investment in R&D		
	2007	2008	2009
OJSC "LOMO"	318 500	329 000	724 000
OJSC "Svetlana"	247 600	298 900	178 000
OJSC "Krasny Oktyabr"	207 849	216 344	295 605
OJSC "Avangard"	142 500	239 000	197 000
OJSC "Silovye Mashiny"	45 360	124 000	1 990 000
CJSC "Vagonmash"	13 072	3 268	15 000
OJSC "Klimov"	10 000	55 900	25 500
OJSC "Khlebny Dom"	8 731	14 034	14 607
OJSC "Zvezda"	3 404	6 213	2 337
OJSC "Vibrator"	3 000	57 323	38 974
OJSC "Farmsintez"*	0	71 000	150 000
OJSC "Baltica"	0	10 800	3 502
OJSC "Kirovski Zavod"	No data	35 000	0
Federal State Unitary Enterprise of Central Research Institute "Elektropribor"	No data	No data	116 406
Ltd. "Gerofarm"	No data	No data	100 000
TOTAL:	1 000 016	1 460 782	3 850 931

* The data about OJSC "Farmsintez" are given for the period from 2008 to 2010.

As it follows from table the decisive role in the growth of investment in R&D was played by OJSC “Silovye Mashiny”, having invested 3.84% of its revenue or 1.99 billion rubles in R&D in 2009. This is almost the same as all the rest 14 enterprises have invested in total.

Most enterprises in dynamics increased or left at the same level volumes of investments into R&D compared to 2007. “Kirovski Zavod”, “Klimov”, “Baltika” and “Svetlana” clearly reduced their investments.

In all, in 2009, 15 enterprises invested 3.85 billion rubles in R&D, that is 17.2% of the total costs of large and medium-sized St. Petersburg enterprises for research [4].

Further you can see the analysis of the factors having influence on the enterprises’ investments in the innovation development.

The first group of factors: size of revenue and net profit. One of the main sources of financing the activities of the innovation of Russian enterprises is its own funds. According to the Federal State Statistics Service, the shortage of internal funds is the most popular response from the

entrepreneurs to the question “What is holding back your investment activity?” – two-thirds of employers indicated this factor [5]. In this connection the relationship between analyzed companies’ investments in the scientific and technological development and the results of their economic activity were investigated. The analysis was carried out over 2009. The objective was to estimate the influence of selected factors on the innovation of the enterprise by the example of one year.

Table 2 represents the data about revenue and investments in R&D of the enterprise.

As it is shown in table, research and development were actively carried out by the enterprises of electronic and instrumentation industries “Avangard”, “Vibrator”, “LOMO”, “Svetlana”, as well as the pharmaceutical industry “Farmsintez”.

A bad result connecting with the ratio of R&D investment to revenue to was shown by “Kirovski Zavod”, which did not invest in research and development at all, engine building plants “Klimov” and “Zvezda”, as well as the food industry enterprises.

Table 2. The ratio between investments in R&D and gross receipt of St. Petersburg companies over 2009, thousand rubles

Company name	2009		
	Gross receipt	R&D investments	Ratio between R&D investments to gross receipt, %
OJSC “Baltica”	93 648 700	3 502	0
OJSC “Silovye Mashiny”	51 783 946	1 990 000	3.8
OJSC “Kirovski Zavod”	8 987 000	0	0
OJSC “Khleby Dom”	8 394 813	14 607	0.2
OJSC “Krasny Oktyabr”	3 315 000	295 605	8.9
OJSC “Klimov”	3 305 140	25 500	0.8
OJSC “LOMO”	3 085 428	724 000	23.5
Federal State Unitary Enterprise of Central Research Institute “Elektropribor”	1 828 038	116 406	6.4
CJSC “Vagonmash”	1 655 221	15 000	0.9
Ltd. “Gerofarm”	1 430 000	100 000	7
OJSC “Svetlana”	977 244	178 000	18.2
OJSC “Zvezda”	904 836	2 337	0.3
OJSC “Avangard”	452 817	197 000	43.5
OJSC “Vibrator”	251 215	38 974	15.5
OJSC “Farmsintez”	228 000	71 000	31.1

Thus, OJSC “Khlebny Dom” having revenue of 8.4 billion rubles spent for R&D about the same as “Vagonmash”, which has much lower rates of gross turnover. The high rate was showed by OJSC “LOMO”: its revenue was 3.1 billion rubles and their R&D investment accounted for 23.5%. The similar index of the world famous photo optic manufacturer concern Canon was only 9.5%.

On the whole, one can say about the group of analyzed companies that a relatively high amount of gross revenue is not always a factor of significant investments in research and development, and it indicates the need for analysis of other factors.

Table 3 shows a comparison of R&D investments and net profit for the analyzed companies.

Table 3 shows that some enterprises' expenses for R&D are greater than their net profit. This is typical for the companies producing electronic components and pharmaceuticals. Such situation is taking place for several years. Consequently, the sources of funding for research and development are not only

their own funds (and therefore, it is necessary to analyze other factors.) We will discuss it in details in the following sections.

In agricultural engineering the situation is different in a negative direction. The crisis of agriculture and the general decline of the Russian economy caused a sharp drop in revenue of “Kirovskii Zavod”, its net loss in 2009 exceeded one billion rubles. Former innovation activity in manufacturing of the escalators for Petersburg underground and the tractors K-774R3M1 and K-9520 received no further in 2009: the company did not invest in technological development.

“Krasny Ochyabr” and “Silovye Mashiny” stand out among the engineering companies: their indicators of R&D expenditure in relation to net profit are very significant.

In order to evaluate the level R&D expenditures by the companies under analysis, table 4 compares the indicators of ratio of R&D expenditures to revenues of Petersburg enterprises with similar indicators of the foreign companies that are technology leaders in their niches.

Table 3. Ratio between R&D investments and net profit of St. Petersburg companies over 2009, thousand rubles

Company name	2009		
	Net profit	Investments in R&D	Ratio between R&D investments to net profit, %
OJSC “Baltica”	23 372 300	3 502	0
OJSC “Silovye Mashiny”	6 005 663	1 990 000	33
OJSC “Krasny Oktyabr”	396 600	295 605	75
OJSC “Klimov”	292 250	25 500	9
OJSC “Khlebny Dom”	274 421	14 607	5
OJSC “Svetlana”	123 784	178 000	144
Federal State Unitary Enterprise of Central Research Institute “Elektropribor”	64 259	116 406	181
OJSC “LOMO”	23 350	724 000	3 101
OJSC “Zvezda”	20 264	2 337	12
OJSC “Farmsintez”	14 043	71 000	506
CJSC “Vagonmash”	12 018	15 000	125
OJSC “Avangard”	7 833	197 000	2 515
OJSC “Vibrator”	5 329	38 974	731
OJSC “Kirovski Zavod”	-1 032 000	0	0
Ltd. “Gerofarm”	No data	100 000	No data

Table 4. The ratio of R&D investments to revenue in 2009: comparison of venues of Petersburg enterprises' indicators with similar indicators of foreign companies

Enterprise	Comparison of R&D investments to gross revenue, %	Sector	Comparison of R&D investments to gross revenue, %	Foreign company	
			22.8	Roche Holding	
"Gerofarm"	7	Pharmaceutics	15.7	Pfizer	
"Farmsintez"	31.1		22.6	Novartis	
"Zvezda"	0.26		14	GlaxoSmithKline	
"Silovye Mashiny"	3.84		5.1	Siemens	
"Kirovski Zavod"	0	Machine building	3.9	Schneider Electric	
"Avangard"	43.5		2.1	General Electric	
"Svetlana"	18.2		16.2	Cisco Systems	
"Vibrator"	15.5	Electronics	5.8	Samsung	
"Elektropribor"	6.4		1.9	Electrolux Group	
"Khlebny Dom"	0.2		1.9	Nestle	
"Baltika"	0	Food industry	4.2	Carlsberg group	
"Vagonmash"	0.9		3.3	Alstom	
"Krasny Oktyabr"	8.9	Carriage engineering	6	Ruag Group	
"Klimov"	0.8		Aircraft building	1.9	Northrop Grumman Corporation
				1.7	Lockheed Martin Corporation
"LOMO"	23.5	Optical instruments and devices	9.5	Canon	

As it follows from table 4, many analyzed companies are comparable with foreign competitors by the indicator. But we should not forget that in absolute terms all would be different: revenue of foreign companies is much higher. But we should not belittle the role of the relative index; it is a very sensitive indicator that characterizes the innovation activity of companies.

On the whole, the analysis of the influence of revenue and net profit over the innovative activity of enterprises didn't reveal unequivocal direct relationship between the indicators. This requires an analysis of other factors.

The second group of factors: average number of employees. According to official statistics, large enterprises are much more active in terms of innovation than small and medium-sized enterprises. This is primarily due to the fact that the larger the enterprise, the larger the human,

technical and, above all, financial resources for innovation. On average in Russia about 65 – 70% organizations among those with workforce at least 10 000 employees perform technological innovation, and as for small organizations with workforce of up to 50 people, this indicator is 1 – 2% [4].

Table 5 represents the data on the average number of employees and their investments in research and development

As shown in table, the companies that invest in R&D more than any other investors are the largest of the presented companies. We are talking about the "Silovye Mashiny", "LOMO" and "Krasny Oktyabr". "Baltika" and "Khlebny Dom" fall out of this rule but it is justified by their industry affiliation.

You should also pay attention to the fact that relatively small companies that produce electronics invest a lot in R&D, they are "Svetlana", "Avangard" and "Vibrator".

Table 5. Innovation activity of organizations and number of employees in 2009

Enterprise	Average number of employees, people	R&D investments, thousand rubles	Size of R&D investments per an employee, thousand rubles
OJSC "Silovye Mashiny"	11978	1 990 000	166.1
OJSC "Baltika"	11000	3 502	0.3
OJSC "Krasny Oktyabr"	3092	295 605	95.6
OJSC "LOMO"	2568	724 000	281.9
OJSC "Khlebny Dom"	2428	14 607	6.0
OJSC "Zvezda"	1243	2 337	1.9
CJSC "Vagonmash"	1014	15 000	14.8
OJSC "Svetlana"	734	178 000	242.5
OJSC "Avangard"	720	197 000	273.6
OJSC "Vibrator"	283	38 974	137.7

The third group of factors: external sources of financing of R&D. Above we have outlined the results of analysis of the correlation between investment in R&D and gross receipts of enterprises, their net profit, which is the main own source of funding of R&D investments.

Along with it, the source of financing of the innovation can be loan capital: from distribution of shares on the exchange, from lending agencies, from the state and from the contractors. Obtaining financial resources from the contracting parties is an inappropriate source for their long "freeze" in R&D: the buyer and the providers usually lend to each other by turn, "short" money. Issue of shares and bonds is available to very few Russian companies. Therefore, the attention was focused on the lending agencies and budgetary sources.

Many high-tech enterprises enjoyed sluggish long-term borrowed current assets and invested in their development little: sometimes there was a lack of resources to replace run-down equipment. The long-term investments were performed solely at their own expense.

"Krasny Oktyabr", "Kirovski Zavod", "Farmsintez" and "Klimov" invest in non-current assets very little. "Svetlana", "Avangard" and "Zvezda" almost do not use long-term loans. We'll examine some specific examples below.

Table 6 shows that "Svetlana" builds up its non-current assets from year to year but it doesn't do this at the expense of long-term

borrowed current assets, the society doesn't practically have them. The enterprise's net profit wouldn't cover even R&D investments. Therefore, the company has other funding sources, in this particular case – they are budgetary sources.

OJSC "Avangard" borrows relatively more "long" money than "Svetlana" (tab. 7). In 2007 – 2009 the long-term borrowed assets allowed to fully cover the long-term investments. At the same time the long-term borrowed assets that were got by Avangard in 2007 – 2008, returned back in 1 – 2 years.

In the Russian financial system, the long-term loans are unavailable to most enterprises. According to the experts of Promsvyazbank: "banks cannot see beyond three years". And as for the loans for 2 – 3 years the effective interest rate is around 12 – 13% for the first-class borrowers, which include not all analyzed enterprises. A few innovative projects can be recouped within 3 years, especially at such a rate. Hence, the apparent contradiction between the intention to build an innovative economy and the real situation on the market of bank lending.

However, at the St. Petersburg economic arena there is a force that is able to soften the contradiction between the underdeveloped financial market and obsolescent capital assets and the cost of research and development. We are talking about the federal and regional government authorities.

Table 6. Correlation between long-term loans and non-current assets of OJSC "Svetlana", thousand rubles

Index	2006	2007	2008	2009	2010 – 3 rd quarter
Non-current assets	818616	906624	970162	970359	1173509
Increase of non-current assets	-	88008	63538	197	203150
Loans and credits (long-term)	649	649	0	1	12
Increase of long-term loans and credits	-	0	-649	1	11
Conclusions by years		The investments were covered by the expense of sources diverse from long-term lending			

Table 7. Correlation between long-term loans and non-current assets in OJSC "Avangard", thousand rubles

Index	2006	2007	2008	2009	2010 – 3d quarter
Non-current assets	110981	134027	144264	179564	177241
Increase of non-current assets	-	23046	10237	35300	-2323
Loans and credits (long-term)	5025	68405	107990	35240	30968
Increase of long-term loans and credits	-	63380	39585	-72750	-4272
Conclusions by years		The investments were covered completely by long-term lending			

The performed analysis of the scientific and production relationship between the analyzed companies and the federal and regional government authorities has revealed their participation in carrying out the federal target programs (OJSC "Zvezda", OJSC "Svetlana", OJSC "Avangard", OJSC "LOMO", "Gerofarm" Ltd., OJSC "Farmsintez"), the state defense order (OJSC "Krasny Oktyabr", OJSC "Klimov", OJSC "Svetlana", OJSC "Avangard"), the regional order – project of new carriages "Neva" (CJSC "Vagonmash"), which provide for the expenses for R&D.

If there is some influence of the state and region on the policy of enterprises in research and development, the participation of the banking system in the rise of innovation (and investment) of enterprises continues to be inadequate.

Comparative analysis of technical and operational parameters for a number of products as the results of innovation. When dealing with manufacturing enterprises that produce goods with high added value, one of the most important criteria for determining the effectiveness of innovation processes is the product competitiveness. Below is a comparison of the technical and operational

characteristics of certain products of the analyzed companies with foreign counterparts.

OJSC "Zvezda": engines for railway trains

Table 8 shows the characteristics of an earlier engine of "Zvezda" M7656-B1, its recent modification – M790, as well as their analog from GE – 7FDL12. Being comparable in size, the engines of "Zvezda" and GE dramatically differ in their characteristics. A modified model of the engine from "Zvezda" shows the local progress of the company (capacity in kW increased by 9%, the resource to a bulkhead of engine increased by almost 3 times), but the domestic engines are still far away from the level of 7FDL12. The capacity of 7FDL12 is higher by 186%, although the operating time to bulkheads has reached a comparable performance. In addition to greater power production, the engine GE also consumes less power. Engine saving setting, having been improved by GE since the mid 1980s, has reached 15%, while our manufacturers do not introduce energy saving technologies, besides it, the weight of 7FDL12 is by quarter less than the weight of M790 – it also speaks of a smaller engine power consumption in its operation.

Table 8. Comparison of technical and operational characteristics of 12-cylinder engines for the railway trains

Characteristics	OJSC "Zvezda"		General Electrics (the USA)
Model	M7656-51	M790	7FDL12
Capacity, kilowatt	736	800	2290
Resources to a bulkheads, hour	11000	29000	26000
Weight, ton	20	20	15,8
Energy saving, %	0	0	15

Table 9. Comparison of technical and operational characteristics of underground cars

Characteristics	CJSC "Vagonmash"		STIB/MIVB (Belgium)
Model	81-553/554/555 – car with asynchronous motor	"Neva": 81-55(6) – head motor with control cabin; (7) – intermediate motor; (8) – intermediate non-motor	Méto série M6
Lightweight, ton, no more	34	29.5 (28; 24)	26.7
Nominal capacity of passengers	161	174 (188; 188)	110*
Seating capacity	40	42 (48; 48)	33
Design speed, km/h	90	90	72
Average acceleration, m/(s ²)	1.2	1.3	1.3
Maximum deceleration m/(s ²)	1	1.4	1.5
* With standard of 5 persons per m ² .			

Thus, the production of OJSC "Zvezda" which invested relatively small amounts in R&D in recent years, is not competitive in technical terms against the background of one of the world leaders in the industry.

CJSC "Vagonmash": carriages for underground railway

Table 9 shows the comparison of innovative development of "Vagonmash" – a series of car "Neva" and a model that has been operated for many years in St. Petersburg, Moscow and other subway systems, as well as in Belgian coach.

Lightweight is an important characteristics because the train energy consumption depends on it directly. As table 9 shows, "Vagonmash" has made significant progress by reducing the weight of car tare. Intermediate non-motor cars have 8-10 tons less than earlier analogs. The STIB product has similar parameters of mass.

By size Petersburg trains are more massive than the foreign ones, they are by quarter longer, wider and can carry by 1.7 times more passengers. "Neva" has also more seats.

Design speed of the domestic trains is higher than that of analogs. But it should be noted that in St. Petersburg metro the rail condition does not allow to hope that the trains will reach a maximum speed of mortgaged to 90 km/h. Average train speed does not exceed 40 km/h.

Note that the "Neva" has the best average speed acceleration and a maximum deceleration compared with the earlier model (81-553/554/555) and they are closer by these parameters to the Belgian train. This fact is important: these parameters are responsible for the opportunity of the train to cover a distance between stations over shorter time intervals, besides slowing down the train is an important feature for the security of passengers at the open underground stations.

Thus, the class of cars "Neva", the first models of which were put into operation to the St. Petersburg subway in March 2011, are competitive in technical terms, in comparison with world analogues. It is proved by the efficiency of innovation activities of Vagonmash.

OJSC “Leningrad optic and mechanical association”: medical microscopes

Table 10 compares technical parameters of microscope LOMO Mikmed-6 and its analog of American company Medical Microscope.

The optical properties of the microscope “LOMO” match the American microscope. Zooming up, a set of lenses and light-element match the level of me0048000m.

Significant investments from the state in R&D of the enterprise allow “LOMO” to support its products on the competitive technical level.

OJSC “Avangard”: stationary gas detection

When comparing two sensors having approximately similar range of gas detection (the Japanese analog measures not only carbon monoxide and methane but also concentration of carbon dioxide), it became clear that the appliance of the foreign producer are relatively more sensitive. However, the performance of gas analyzer “Avangard” meets the industrial requirements of the absolute majority of production. For example, methane is explosive at its concentration in the air of more than 5%, the sensor MGS-98 (MAK-C2M) fixes methane at its concentration of 0.5%.

The difference of the sensors’ thresholds is due to different requirements of state standards. In Japan they are stricter.

We add that the various meters of OJSC “Avangard” can determine the concentration of up to 13 different gases in the air. The performance of Yokogawa is more modest – only 5 different gases. The American manufacturer Signal USA designs meters to determine seven gases.

The meters made by Japanese manufacturer can be used in the laboratories where it is necessary to have high accuracy of determining the concentration of gases in the room, gas analyzers of OJSC “Avangard” is quite suitable for industrial uses of most industrial enterprises and, therefore, they are competitive at this point. This is facilitated by an active innovation policy of the enterprise. But with the development of industry the requirements for support systems, including a gas analyzer will grow. Consequently, with the lapse of time OJSC “Avangard” will have to develop sensibility of meters to the level of Yokogawa equipment.

Table 10. Comparison of technical and operational characteristics of medical microscopes

Characteristics	OJSC “LOMO”	Medical Microscope (the USA)
Model	Mikmed-6	me0048000m
Zoom, multiplicity	40-1500	40-1600
Objectives, multiplicity	4; 10; 20; 40; 100	4; 10; 20; 40; 100
Source of light, W	12; 20; 30	25

Table 11. Comparison of technical and operational characteristics of stationary gas detections

Company	OAO Avangard	Yokogawa (Japan)
Model	MGS-98 (MAK-C2M)	IR100TB
Measured gas	CO / CH ₄	CO / CO ₂ / CH ₄
The lower threshold of the measuring range, mg/m ³	1 / 0,5%	0 / 0 / 0%
Two operating thresholds	20; 100 / 1%	10; 40
Operating temperature range,	(-30, 50)	(-5, 45)
Notes: CO – carbon monoxide; CO ₂ – carbon dioxide (dry ice); CH ₄ – methane.		

Table 12. Comparison of technical and operational characteristics of gas turbines

Characteristics	OJSC "Silovye Mashiny"		General Electrics (the USA)
	GTPS-65	GTPS-160 (under license by Siemens)	LMS100
Model	GTPS-65	GTPS-160 (under license by Siemens)	LMS100
Peak capacity, MW	60	157	97.8
Gas temperature at the output	555	537	400
Gas flow rate at the output of gas-turbine unit, kg/s	184	509	453
Efficiency, %	35.2	34.4	44-50

OJSC "Silovye Mashiny": gas turbines.

Table 12 contains the comparison of operating parameters of three turbines: GTPS-65 made by "Silovye Mashiny" on its own technology, GTPS-160 – licensed by *Siemens* and LMS100 – turbine of GE production.

Gas turbine converts the energy of compressed and heated gas into mechanical work, driving the turbine blades which transmit the torque moment through the turbine disks to the shaft, which transfers energy to the generator.

In accordance with the flow of gas the analyzed turbines give comparable parameters of energy transfer to the generator. Efficiency is an important characteristic here, it characterizes the efficiency of converting thermal energy of natural gas into kinetic energy. By this parameter GE beats the units of "Silovye Mashiny" for more than 10%, if you are guided by a series of LMS.

This means that "Silovye Mashiny" should increase the processes associated with research and development to enhance the technical competitiveness of product, which is necessary for the functioning of the electricity industry.

Thus, the enterprises need to carry out innovative activity related to most marked in this section range of products in order not to be behind their global competitors in terms of deepening interpenetration of economic ties between the economic agents of different countries.

Conclusion

The analysis suggests the following conclusions:

- It confirms the well-known thesis that larger firms have greater access to monetary resources for innovation activity (equity or debt capital). There is a direct relationship between the number of employees at the enterprise and business spending on R&D.

- Equity is an important source of funding for R&D, but an unambiguous direct correlation between the sizes of revenue / profit and investments in R&D in 2009 for all analyzed enterprises is not detected, which indicates the effect of other factors (ex.: changes in market conditions of "Kirovski zavod").

- Weak role in financing innovation activities of Petersburg enterprises is played by the banking system, it is of little help to the strategic development of real sector production.

- Among the external sources of financing innovation activities of enterprises the leading role is played by the resources of federal and regional budgets. Targeted programs, defense contracts, state competitive biddings and competitive tenders are an important source and incentive of funding research and development by St. Petersburg companies.

- Without the deployment of innovative activity by St. Petersburg enterprises their lag in the production of core products from the world leaders can make the manufacturing industry of Petersburg uncompetitive.

It should be noted that the companies cannot rely only on federal and regional resources. To transit to the normal market functioning both the companies' efforts for building and implementing a long-term development strategy

and the government efforts for developing legal and institutional field of regulation of industry and innovation activities are required, which are adequate to fiscal realities of the market of taxation and infrastructure conditions.

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