Prospects for development of small innovative mechanical engineering enterprises on the territories of advanced development

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Abstract. Small innovative mechanical engineering enterprises are extremely important for the development of the Russian economy. This article discusses the different points of view on the issues of small enterprises, machine-building organizations and innovative enterprises. The analysis of the obtained problems is carried out and essential ones are selected from the point of view of the maximally hindering the successful development of small innovative mechanical engineering enterprises. Consideration of the conditions of the territories of advanced social and economic development showed that only one of the selected problems is being solved. It is a high level of taxation. The authors propose to expand the functionality of the territories of advanced development through the use of personnel marketing, the establishment of a business school and a consulting center, which will create truly favorable (but not excessive) conditions for the development of small innovative mechanical enterprises on the territories of advanced social and economic development.

Mechanical engineering is one of the most important industries, the main source of innovative development of the region and the country as a whole, because it is thanks to the development of this sphere that it becomes possible to equip enterprises with advanced production equipment. Due to its functioning over the past five years, an average of 15% of gross domestic product (GDP) is created, about 40% of the working population are engaged in mechanical engineering enterprises [12]. The modern economy should be based on knowledge and advanced technologies. This is not the economy of standard mass production. A new economy is built on the base of flexible production of goods and services. Production increase, which is mostly based on information technology, allows developing so-called flexible plants and factories, in which the increase in the diversity of manufactured goods is not accompanied by a significant increase in production costs. Thus, it can be concluded that small innovative mechanical engineering enterprises take on special significance in the present economic realities. At the same time, economic development is hampered by problems that are inherited from small businesses, machine-building enterprises and issues of increasing the level of innovativeness of the national economy. Let us consider the problems in these areas separately and highlight those that are inherent in them all together. This approach will improve measures for the development of small innovative mechanical engineering enterprises.
The issues of small business were considered in the works of Alexandrova E N [1], Vorst Y [6], Glinova T A [7], Golubev Yu N [8], Gribanova N N [9], Kravchenko T E [1], Reventlov P [6], Sanina L V [19], Turenko B G [21] and Shupletsov A F [23]. No less important is the opinion of entrepreneurs themselves.

The results of sociological surveys on small business development, in an analytical report prepared by the Russian Association for Small Entrepreneurship Development on the topic "Small Business in Russia. Problems and Prospects", the main problems of private business are formulated as follows [8]: high taxation; imperfect legislation, cost inflation, economic activity conditions, supply deficit, barriers in receiving credit and high rate for credit, insolvency and non-commitment of partners and customers, imperfect banking system, political context, bureaucracy, lack of production facilities and offices, corruption and bribes, lack of material resources, governmental financial policy, search for customers and consumers, high prices for raw materials, monopoly of government and governmental enterprises, difficulties with renting, rupture of economic connects, lack of information, lack of entrepreneurial culture and experience, personnel problems, lack of own funds, unprofitability of production, cumbersome accounting reporting, lack of preferences, racketeering, unprofitability of investments, unfair competition, imperfection of market, distrust of foreign partners, negative attitude towards entrepreneurs. In general, Glinova T A [7], Gribanova N N [9], Sanina L V [19], Turenko B G [21] and Shupletsov A F [23] agree with this point of view.

It is very interesting to look at the problems of small business from abroad. In regular surveys in the small business environment of the United States, the main reasons for the failures of their activities are often called as business incompetence, unbalanced experience (for example, an experienced engineer, but an inexperienced merchant); lack of experience in commerce, finance, supply, production, management (both in individual forms of ownership and in partnerships), inability to establish and maintain business connections and contacts [6].

Alexandrova E N and Kravchenko T E believe that the actual problem of small business development in Russia is limited access to and complexity of financing of small businesses. Practically it is expressed by high cost of financial resources, lack of long-term investment funds, strict requirements for the borrower, long terms of credit application consideration [1].

Surveys of entrepreneurs in small business reveal such a problem as high costs of administrative procedures [15].

According to another survey among the major problems of modern business climate is called the negative assessment of small enterprises during the last years, namely, high level of unfair competition (37% of respondents said this), a significant taxation (29%), unavailability of funding (11%) [10].

A separate problem in small business development persisted over the past decade, is the low level of awareness of business owners about existing government programs [22].

Problems of mechanical engineering enterprises are covered in many scientific works [2, 3, 4, 16, 17, 20]. So, according to Ryzhikova T N and Borovsky V G [17] these include: the steady increase in the proportion of orders not completed on time; obsolescence of fixed assets; extremely low proportion of machine tools with numerical control and multi-axis machining centers; outdated manufacturing technology; high proportion of manual labor; personnel deficit and turnover; territorial disunity; low capacity utilization; high proportion of equipment with 100% obsolescence; insufficient provision of computer equipment; lack of internal information exchange; limited repair and mechanical service.

Belyaev V V highlights the main problems of national enterprises functioning. They are the following: a high level of taxation and the lack of international standardization products (in legislation field); low competitiveness and outdated methods of organizational management, underdeveloped quality management system (in the field of organization); low quality, competitiveness and investment attractiveness (in the field of products); high turnover and shortage of qualified personnel (in the field of personnel); critical physical and moral deterioration of equipment and technologies (in the field of production assets) [3].

Bereshpobet S I and Timshin A N present in their work the results of a survey of representatives of machine-building enterprises of the Kemerovo Region. According to this survey, the main problems of
enterprises, due to which their products are not currently exported abroad, are: the lack of government support measures, the inefficiency of exports compared to sales in the domestic market, as well as the decline in demand due to the global financial crisis effects. For some industries, such as carriage-building, the main problem, among others, is the need to meet international quality standards. An important issue has been remained the lack of highly qualified personnel [4].

On the question of the reasons for the overall low level of engineering products competitiveness of the Kemerovo region, 77% of the research participants indicated obsolete equipment and technology and the lack of new scientific and technical ideas as the main reasons. Another important problem is the narrow market.

The lack of monetary investments is the main problem of the industry, which slows down the development pace. This is explained by the country's unfavorable investment environment, which makes investments in Russian enterprises risky.

Baramykina M V and Korobkova Yu Yu state that there are several main and especially important problems of modern management in Russia, which hinder the successful development of management in metallurgical (engineering) enterprises: a high degree of centralization of management; focus on maintaining production, not on making profit; the exception of the leader himself from the activities of creating and maintaining performance; wrong distribution of responsibility; the problem of the depreciation of production assets [2]. Sokolova L G agrees with this point of view [20].

Currently, the economic situation of the mechanical engineering complex is quite difficult. The main problems of Russian engineering industry can be summarized as follows: significant obsolescence of its fixed assets; low capacity utilization; inefficiency of enterprise management and of existing reserves usage; low level of innovation activity in the industry. All this leads to low competitiveness of products, which is noted today by both researchers and businessmen [16].

Let us consider the problems of Russian innovative enterprises development [13, 14, 18, 22]. According to Pashtova L G and Baev G O, these include less-development of the Russian venture capital market, a short planning horizon for Russian investors, finance access barriers, unfavorable economic conditions, administrative barriers, instability of property relations and corruption [13]. This point is shared by Shevchenko I V, Alexandrova E N and Alexandrov A V [22].

The Russian market is very young in comparison with Western countries, as well as the Russian venture capital market. According to estimates of the Russian Venture Company (RVC) and the Russian Venture Capital Association, the total capital of all Russian venture capital funds (which invest in technology start-ups) is $30.3 billion, and the total investment in the first three quarters of 2014 was only 0.63 billion dollars [11].

The most important problem is poor-quality management in innovative manufacturing companies. Poghosyan R R believes that the study of the works of both foreign and Russian economists can identify the following barriers that limit the development of innovative enterprises:

- significant cost of innovation creation and implementation; difficulty of control and monitoring of expenses related to innovations;
- complexity of access to investment and financial resources; high risk of innovative activity;
- lack of staff and difficulty in retaining skilled workers;
- high resistance of both employees and management to changes caused by innovations; insufficiency or lack of necessary technological and market information;
- insignificance or ineffectiveness of government support; lack of necessary regional infrastructure;
- instability of the national or regional economy.

In addition to the above problems in the functioning of small innovative enterprises, it is possible to identify the factors inherent in the Russian economy, limiting the innovative development of small enterprises and of a structural nature. First of all, it is the lack of a legal basis for the activities of small innovative enterprises: for example, the existing regulatory framework governing the activities of small
innovative enterprises regulates mainly the sphere of intellectual property, ignoring or casually mentioning innovative activities. Secondly, the low demand for small innovative business, mainly due to low competition and lack of motivation among entrepreneurs who prefer to engage in activities that consistently generate profits. Thirdly, there is a lack of personnel or insufficient qualification of them, which is reflected in the problem with both managers and technicians, as well as a “brain drain”. The latter can be identified as an unfavorable economic background: for example, the crisis in the economy affects both science and education, and as a result, does not allow small innovative entrepreneurship to develop [14]. Samaruha A V agrees with this point. [18].

Based on the analysis of the materials of scientific articles, we can conclude about the issues of small innovative mechanical engineering enterprises (see table 1).

**Table 1. The Issues of Small Innovative Mechanical Engineering Enterprises.**

| Field of Activity | Issue                                                                 |
|-------------------|----------------------------------------------------------------------|
| Business Infrastructure | poor quality management of innovative enterprise; high resistance of both employees and management to changes caused by innovations; insufficiency or lack of necessary technological and market organizational information |
| Economic Environment | uncomfortable economic environment; instability of national or regional economy |
| Government | high taxation, administrative barriers; property insecurity and corruption; insignificance or inefficiency of government support; lack of necessary regional infrastructure; lack of legal basis for small innovative enterprises |
| Finance | finance access barriers |
| Labour Market | incompetence of staff; lack of staff experience in various areas |
| Entrepreneurial Culture | less-development of the Russian venture capital market; short planning horizon for Russian investors; insolvency and non-commitment of partners and customers; lack of entrepreneurial culture and experience; negative attitude towards entrepreneurs; distrust of foreign partners |

To support small innovative mechanical engineering enterprises the government implements various measures such as the territory of advanced economic development, open economic zones, national projects, etc.

The development of the machine-building complex enterprises requires a high level of infrastructure development: manufacture, financial, informational. One of the modern tools for the formation of such conditions is creation of the territories of advanced social and economic development. A feature of this tool to support small innovative mechanical engineering enterprises is a preferential tax regime. At the same time, we see that table 4 lists the issues of small innovative engineering enterprises, and only one of them is solved with the help of the territories of advanced social and economic development.

Our proposal is to develop measures to solve these problems and to include them in the territories of advanced social and economic development function (table 2).

**Table 2. The Measures Solving the Problems of Small Innovative Mechanical Engineering Enterprises on the Territories of Advanced Social and Economic Development.**

| Field of Activity | The Issue                                                                 | The Measure |
|-------------------|--------------------------------------------------------------------------|-------------|
| Business Infrastructure | poor quality management of innovative enterprise; high resistance of both employees and management to changes caused by innovations; insufficiency or lack of necessary technological and market organizational information | - |
| Economic Environment | uncomfortable economic environment; instability of national or regional economy | - |
| Government | high taxation, administrative barriers; property insecurity and corruption; insignificance or inefficiency of government support; lack of necessary regional infrastructure; lack of legal basis for small innovative enterprises | - |
| Finance | finance access barriers | - |
| Labour Market | incompetence of staff; lack of staff experience in various areas | - |
| Entrepreneurial Culture | less-development of the Russian venture capital market; short planning horizon for Russian investors; insolvency and non-commitment of partners and customers; lack of entrepreneurial culture and experience; negative attitude towards entrepreneurs; distrust of foreign partners | - |
| Category                  | Issues                                                                 | Solutions                                                                 |
|---------------------------|-------------------------------------------------------------------------|---------------------------------------------------------------------------|
| Business Infrastructure   | Poor quality management of the enterprise; high resistance of employees and management to changes caused by innovations; insufficiency or lack of necessary technological and, market organizational information | A consulting center as a part of management system of the territory of advanced social and economic development |
| Economic Environment     | Uncomfortable economic environment; instability of national or regional economy | Tax preferences on the territory of advanced social and economic development |
| Governance                | High taxation, administrative barriers; property relations insecurity and corruption; insufficiency or inefficiency of government support; lack of necessary regional infrastructure; lack of legal basis for small innovative enterprises | Alternative resources of financial support |
| Finance                   | Finance access barriers                                                 | A business school for entrepreneurs                                         |
| Labour Market             | Incompetence of staff; lack of staff experience in various areas         | Branding and promotion of a positive image of a Russian entrepreneur       |
| Entrepreneurial Culture   | Less-development of the Russian venture capital market; short planning horizon for Russian investors; insolvency and non-commitment of partners and customers; lack of entrepreneurial culture and experience; negative attitude towards entrepreneurs; distrust of foreign partners | |

In addition to tax preferences on the territories of advanced social and economic development, it is necessary to develop and promote a positive image of the Russian entrepreneur. Including due to the wide involvement in the invention of all those interested in this issue [5]. This measure will eventually change the public opinion about entrepreneurs, but it is important to set and observe high standards for the words of the entrepreneur that no sooner said than done. The problem with the staff incompetence can be solved only with the help of training, the best format here will be a business school similar to MBA. If the problems of innovative mechanical engineering enterprises after training will take place, they can be solved with the help of a consulting center included in the management system of the territory of advanced social and economic development. We believe that by offering such a range of services, the territory will be able to justify its name of "advanced development". Other specified issues of small innovative mechanical engineering enterprises from areas "Finance" and "Economic Environment" can be resolved independently by businessmen as a result of their enterprises activity on the territories of advanced social and economic development.

The tool for development of small innovative mechanical engineering enterprises in the form of the territories of advanced social and economic development should be able to solve the problems facing this type of organizations. Based on the fact that over time these problems may change the Federal law "About the Territories of Advanced Social and Economic Development" should take into account these changes. The effectiveness of this law should be monitored at regular intervals and the legislator should take measures to develop small innovative mechanical engineering enterprises on this basis.

References
[1] Alexandrova E N and Kravchenko T E Current issues of small enterprises development in the Russian economy 2015 Economics and Management: Analysis of trends and development prospects (Novosibirsk) 21 192-5
[2] Baramykina M V and Korobkova Yu Yu 2016 Main problems of industrial management at the enterprises of metallurgical and machine-building complexes *The Future of Science* ML 13(1) 41-3
[3] Belyaev V V 2014 Analysis of the domestic engineering state *Samara State University Bulletin* 6(117) 39-47
[4] Bereshepolets S I and Timshin A N 2014 Research of the problems of machine-building economy development in of Kemerovo region *IV Intern. Scientific. Conf Prospects for the Innovative Development of Coal Regions of Russia* (Prokopyevsk) p 351-4
[5] Vikhoreva M V, Vikhorev V G and Ogloblin V A 2016 Ways increasing the economy innovation degree *Baikal Research Journal* 7(2) https://doi.org/10.17150/2411-6262.2016.7(2).14
[6] Vorst Y and Raventlow P 1994 *Firm Economics* (Moscow: High School) p 270
[7] Glinova T A 2015 Issue of small business development in Russia ART 15266 Available from: http://e-koncept.ru/2015/15266.htm ISSN 2304-120X
[8] Golubev Yu N, Lokshina E Kh and Chasova T D 1994 *Entrepreneurship: origins, problems, prospects* (St. Petersburg: University of Economics and Finance) p 162
[9] Gribanova N S and Gribanova N N 2015 Fundamentals supporting small and medium-sized business development in Russia *Baikal Research Journal* 6(5)
[10] Index of quality conditions for small and medium-sized business in 2011-2012. The regional disproportions 2014 (Moscow: MSP Bank)
[11] Analytical report on the results of the Russian venture capital market review for the I-III quarter of 2014 *Market Overview*
[12] Ovchinnikov V V Problems of the Russian economy current and future competitiveness Available from: http://www.netda.ru/konf/inion/201103/ovchinnikov.htm
[13] Pashtova L G and Baev G O 2015 Actual problems of start-ups (small industrial enterprises) in the Russian economy *Financial Analytics: Problems and Solutions* 37 26–40
[14] Pogosyan P P 2015 Small innovative enterprises: problems and prospects of functioning *Rostov State Economic University Bulletin* 3(51) 135-41
[15] Entrepreneurial climate in Russia http://new.opora.ru/projects/index (access date 08/02/2019)
[16] Pronina S V 2001 Organizational and psychological aspects of maintaining enterprise competitiveness while its restructuring process *Bulletin of Nizhny Novgorod University named after N.I. Lobachevsky* 2(3) 575-9
[17] Ryzhikova T N and Borovsky V G 2014 Problems of modernization of machine-building enterprises in Russia at the present stage *Economic Analysis: Economics and Practice* 17(369) 23-9
[18] Samarukha A V 2014 Management system as a factor of increasing the competitiveness of innovative enterprises *Irkutsk State Technical University Bulletin* 10(93) 242-5
[19] Sanina L V 2014 Problems and prospects of providing financial support to small and medium-sized enterprises of the Irkutsk Region *Irkutsk State Economic Academy Bulletin* 1
[20] Sokolova L G 2018 Improvement of management methods of industrial enterprises in the context of management approaches *Baikal Research Journal* 9(1) https://doi.org/10.17150/2411-6262.2018.9(1).8
[21] Turenko B G 2013 *The comprehensive strategy for small and medium-sized businesses development* (Irkutsk)
[22] Shevchenko I V, Alexandrova E N and Alexandrov A V 2004 The Southern Federal Region: What is beyond the horizon? *Regional Economics: Theory and Practice* 1 49-59
[23] Shupletsov A F 1997 Small business of the Irkutsk Region: problems of formation and development *Irkutsk State Economic Academy Bulletin* 13 59-71