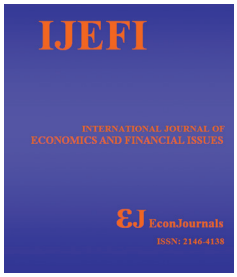

International Journal of Economics and Financial Issues

ISSN: 2146-4138

available at http: www.econjournals.com

International Journal of Economics and Financial Issues, 2016, 6(S8) 184-188.

Special Issue for "Fundamental and Applied Research in Economics and Management: New Perspectives"

The Economics of Innovation in Modern Russia: Practice, Problems and Prospects

Rinad A. Popov[1]*, Aleksandr N. Sekisov[2], Natalia A. Shipilova[3]

[1]Kuban State Technological University, Krasnodar, Russian Federation, [2]Kuban State Technological University, Krasnodar, Russian Federation, [3]Kuban State Technological University, Krasnodar, Russian Federation. *Email: popovra51@gmail.com

ABSTRACT

In formed over the past quarter century in Russia the competitive market system has come to the fore the profitability of innovation, especially in production systems, industry and construction. Slightly less profitability factor manifests itself in the evaluation of innovations in social systems, yielding the position of the virtual indicator of socially useful significance of such innovations: The expansion and improvement of educational, children's and medical institutions, objects of culture and sports, non-profit facilities, "relaxation" and recreation. In the latter case, the economic effect of innovation is manifested in an indirect form, and after a considerable lapse of time: In the employability and technical culture of employees, in expanding the number and improving the quality of the labor pool in the intellectualization of law and order and labour discipline (law-abiding, tolerance) etc.

Keywords: Innovation, Economic Efficiency, New Appliances, Security, Industrial Equipment and Machinery, Wear and Tear, Cluster
JEL Classifications: O14, Q26, Q57, Q58

1. THE EFFECTIVENESS OF INNOVATION

As for production innovations, despite their obvious quantitative assessment of economic efficiency of planned and implemented innovation meets some difficulties. If the system is being upgraded production facility in General, the assessment of economic effectiveness of innovation allows for the consideration of it as a "black box" that compares the cost of input and results output. For instance, to classify the whole plant or the plant with clearly defined technical and economic parameters in the "input" and "output" (for example: The plastics plant; iron foundry; the machining shop parts; electroplating shop; a sewing shop; a paint room; a self-supporting building site older manufacturer, etc.) or a separate species autonomizing industrial complexes or construction machine (e.g. a robot on the Assembly line; tunnel kiln brick plant; rotary kiln cement plant; metal processing complex with numerical control for the manufacture of metal molds; the excavator to perform specific volume of the excavation or loading operations; construction crane at the construction site). For recognizing technical and economic calculations one of the above-mentioned objects of investment in innovation can be defined in natural-material and cost indicators associated with the implementation of such activities, costs and received (or expected) results, to carry out their quantitative comparison and to provide expert assessment. If is used for the comparison to be innovative action (upgrading or replacement) of the object, the calculation of the efficiency of innovative actions is advisable as a result of such events on other objects, and in their absence - according to counterparts.

In the case of the implementation of innovative actions in the economically non-detached part of the production system (for example: A transmission line; water pipeline; pipeline to pump gas; the heating main) determining the corresponding effect associated with the necessity of using stochastic methods, expert analysis and other methods, qualitative and quantitative determination of parameters in the elements of weakly structured systems. In this case estimates are not exact values, but to have a variation in the radius of probable values (Abalkin, 2002).

Individual applied scientific problem is the determination of the effectiveness of innovation in instrumentation, computing, system

explosion and fire protection equipment industrial sanitation and safety, eco-security system and apparatus. On the one hand, this technique is quite blurred the line between operational novelty and technical perfection of the devices. After all, to bring a synergistic effect may original combination of unchanged instruments. On the other hand, the replacement of the previous device or apparatus for more advanced does not always results in the improvement of economic results; advanced equipment because of the high cost, they often don't pay off the results of his production. For example, some meters can determine the efficiency of devices of explosion-fire? - Number of signals about the fire or about the critical concentrations of explosives? - It is obvious that, with respect to this technique in the evaluation of the effectiveness of innovation requires not just quantitative, indicators (measures).

In the Russian economy with the development of production systems increases the degree of saturation of the instrumentation. Tendencies this phenomenon is due both to the Genesis of technology and the growing public requirements to the level of protection of workers from the harmful effects of production, and in mining and lives of miners, miners. Despite the increased recent attention of the Russian Government and regulatory authorities to preventive measures in this field, still happening of the accident indicate that in this region until withdrawn organizational and technical security of personnel in underground mines (Ziyadullaev and Popov, 2015).

Another facet of this problem is the need to quantify and assess the impact on the environment industrial facilities - industrial enterprises, construction sites, farming, and settlements. Intensifies the need to accurately identify the harmful effects of the production and the comparison of the production and technological benefits from damage to nature and man.

2. WHAT MEASURE OF THE INNOVATION EFFECT?

The difficulty of quantitative assessment of the impact of innovation encourages the development of indirect methods for the economic evaluation of such activities, methods of analogies, mathematical treatment of stochastic dependencies indirect effects, questioning employees and business partners, Delphi. However, the results of such research methods are difficult to assess in part the feasibility of the usefulness of innovations both in terms and deadlines. In the high volatility of the economic environment in the mega - and macro-levels hampered the determination of the economic effect from the installation of production equipment and instrumentation, designed for long-term use, that have a significant impact obsolescence, uncontrolled changes in market conditions.

In prevailing in the Soviet Union for seven decades of the last century administrative-distributive system of economy planning innovation called the events on the new technology. In the system plan is subject to compulsory execution, and so new equipment was installed and started in manufacture, usually in the planned volumes and deadlines. However, the effect of the use of such equipment, as a rule, was not determined, since it is almost not reflected on the general results of economic activities of socialist production enterprises. As an incentive to innovation at the time was the order of the Minister subject to compulsory execution. Therefore, innovation activities of enterprises were largely unsystematic, wave nature, the form of execution of directives. The new equipment was installed a lot of equipment, but significant part in the subsequent poorly used because of the irrelevance of specific production systems. The management of the enterprise was not economically interested in innovation, and often shied away from the respective plans, and be not demand from the administrative center (trusts, major departments, ministries) for the effective use of such equipment.

Observations show that on the Russian market equipment prices complicated (sets) of equipment, especially a piece of manufacturing, different suppliers significantly vary, which, however, is not directly associated with its performance (characteristics). Significant impact on the price of the manufacturing equipment having the authority of the manufacturer, which is earned by decades of hard work of an intellectual elite, managers, engineers and workers. For example, in the oil and gas industry and capital construction in the procurement of materials handling and earth moving equipment, preference is given to the car companies Volvo, Kato, Komatsu, Caterpillar, Hyundai, Man, Liebherr, although its prices in Russia by 20-40% higher than similar products of Russian manufacturers. To explain such preferences of customers of the highest possible technical parameters of machinery and equipment of the above mentioned companies, as well as the successful marketing (Inshakov, 2013).

If the effect of the new earthmoving and lifting equipment can be calculated with a fairly high degree of accuracy the direct expense of time and resources, the effect of positional equipment in manufacturing plants, pipeline corridors are typically not amenable to such measurements and computations. In this situation, calculation of economic effect from the installation of hardware can be done with some degree of approximation. Moreover, in a volatile economic environment such calculations are becoming a pronounced stochastic character (Prokhorova, 2010).

In a competitive market economy in modern Russia, in contrast to the former socialist economy, the economic performance of investments in new equipment and technology becomes a decisive factor. It actualizes the development of methods of economic evaluation of scientific and technical innovations into production. The complexity of this problem is particularly noticeable in Russian industry and capital construction; this is due to the large variety of industry-specific national economies and using a variety of technological equipment in production.

In drafting the organization of construction and project works before the developers building task is to choose the most effective machines and mechanisms, from which the most rationally combined the following two indicators - high performance and low costs. In this case, the cost estimate may be performed as a one-time positions (for purchase) and permanent (systematic operating costs, and renting and leasing - lease payments). With respect to capital construction in conditions typical for modern

Russian economy increased variability of the environment as lease payments and total operating costs during the construction of the object will increase. This necessitates a prediction of the corresponding trend and ignoring it when calculating the economic impact of comparable instances of construction machinery and equipment. This technique can be recommended in calculations of the upgrade construction of the Park - jib and tower cranes, excavators, concrete pumps, dump trucks, plaster aggregates, etc. (Popov, 2012).

In the calculation of efficiency of investments in new equipment it is impossible not to take into account the fact that the exhaust depreciation period machines and equipment often (it is typical for many Russian enterprises) continue to be used outside for a number of years. The use of accelerated depreciation of machinery and equipment, which is practiced by a Russian construction firm, carrying it on the costs of construction, substantially lengthens this period. On completion of the amortization period of the machine its owner essentially becomes the owner of two machines - real and virtual (in the form of a monetary amount). While operating costs excluded from depreciation, and the Fund of funds for the purchase of an equivalent machine brings interest rates. It allows to enter the corresponding multiplying factors in the calculation of the innovation effect. Their calculation can be carried out using techniques of factor analysis.

3. HOW TO CALCULATE EFFICIENCY OF INVESTMENTS IN "LONG-PLAYING" EQUIPMENT AND MACHINES?

Recent in Russia (as in many countries in Western Europe) a contraction of business activity in industry and construction, reducing the margin in the volume of investment and share of profits in the mass construction contract toughen requirements to the accuracy of the calculations of the economic effects of technical innovation, equipment replacement and technology changes.

For example, a study of the effectiveness of the implementation of new technology and implementation of scientific-technical activities in the departments of LLC "Gazprom Transgaz Krasnodar" spreading its activities in gas transportation on the territory of Krasnodar region, Republic of Adygea and the Rostov region showed the presence of some problematic points in determining the economic effect from the introduction of organizational and technical innovations. A feature of this production system is the high saturation of modern information technologies based on the use of precision measuring instruments included in the telecommunication system, the dispersal of production facilities on a large area (about 1 thousand km).

According to the practice in Russia the traditional method of calculation, in respect of investments, the performance of which is subject to direct accounting, the economic effect of the implementation of measures for new technology is determined by the Formula $A = (B1-B2) \times C$, where: A - Profit from promotional activities before taxation; B1 and B2 - The cost of works (services) under the old and new equipment; - growth in the volume of works (services) as a result of innovation. At the same time net income is determined by the Formula $D = A \times (1-E)$ where: D - Net income; A profit before tax; E - The profit tax.

In accordance with the conventional method, the economic effect from the introduction of new technology in production departments of LLC "Gazprom Transgaz Krasnodar" was estimated as the ratio of investment and achieved a result of such event of reducing operating costs for the period of 1-year. The measures proposed replacing depreciated and fully amortized equipment with the new one, we compared the technical and economic parameters of the old and new equipment. The investment objects, where the result of innovations should become the increase of volume flow of natural gas through pipelines under the jurisdiction of the organization, the innovation efficiency was calculated based on industry average specific net profit growth in the volume of gas transportation. This approach to evaluating the effectiveness of innovation is legitimate and subject to distribution to other areas, where productive activities is the increase in the volume of transportation of goods, such as electricity, water, petroleum products. This is because in such situations the result of the implementation of measures for new technology is getting the reduction in cost per unit resulting scope of work (services) throughout the chain of participants in this event.

The main part implemented in OOO "Gazprom Transgaz Krasnodar" scientific and technological innovation has a payback period of 1-2 years, which testifies to their high efficiency. Including: Some types of instrumentation, metering devices of water and wastewater, and certain types of construction equipment, resource-saving technologies. At the same time, the payback period of some of the innovations beyond the 2 years; among them some of the devices included in the telecommunication system, the system of protection of pipelines from corrosion, etc. The problem of evaluating the economic efficiency of such changes is complex due to the high volatility of the economic environment, which makes the prediction of long-term trends. In OOO "Gazprom Transgaz Krasnodar" one of the important measures is the replacement of expiry, obsolete cathodic protection stations (RMS) of steel pipelines against electrochemical corrosion. Replacement of obsolete RMS better ensures a reduction of power consumption, and the need for regular repair work, increases the level of explosion-fire safety in the transportation of gas. RMS usually operate for 8-10 years. However, the formal calculation of the cost of updating them according to traditional methods makes this event even unprofitable for such period.

In the Russian practice of feasibility studies of innovations has not yet received sufficient development of methodology for calculating the effect of extending the operation of transport systems and equipment. For example, in one of the units, OOO "Gazprom Transgaz Krasnodar" in the Rostov region in the result of the replacement of 16 RMS that have a cost of 2.1 million rubles, - the direct economic impact in the form of net profit from the reduction of electricity consumption for the year amounted to 60 thousand rubles. If we estimate the effect of such technical innovations are only the sum of the direct savings, the payback will be 30 years, or the longest period of operation of a gas pipeline.

How to measure and evaluate increasing the level of explosion-fire, saved from the trouble-free operation, as well as the fact that improving the protection of metal from corrosion extends the life of pipeline maintenance, and hence the extra profit from pumping gas? Something similar believe it possible to include the transmission lines of high power, trunk pipelines and oil pipelines, chemical and power plants and other large industrial systems, where the key to the effectiveness of the innovation is the extension of the lifespan. This circumstance gives the basis to enter into the complex evaluation of parameters of efficiency of measures for new technology indicators such as profit growth by lengthening the estimated useful life of equipment and machinery. Similarly, you can evaluate the action for installation of the instrumentation, especially that which serves to prevent accidents in industrial and transport systems. Naturally, in this case not to do without expert assessment and stochastic methods of calculation of economic effect (Static Russian Yearbook 2014, 2014).

4. HOW TO ORGANIZE AND STIMULATE INNOVATION?

In modern Russian practice the planning and organization of innovative activity in the macro scale do large corporations; there is a special internal documents of the planned innovation activities in the units and determine what incentives - administrative and economic. For example, in the system of OAO "Gazprom" divisions (affiliates) are developing special plans for implementation of new technology and scientific-technical activities for the next year which set out the specific objects of innovation, cost and timeline. Assessment of efficiency of innovations in the divisions is carried out on the basis of the scale of the Corporation's interim guidelines on determination of the commercial efficiency of new technology. Since the plan is the law, for his failure to comply with the heads of the units' subject to administrative and responsibility, deprived of premiums. As the change of techno-economic situation interim guidelines are subject to periodic adjustments, which gives them a relevance according to the environment. As shown by the study, the system planning and stimulation is quite effective - plans innovative activities typically are performed.

Shown above form the planning and organization of innovative activities in vertically integrated companies of Russia allows to build a very slender and innovation strategy in a systematic manner to ensure the modernization of production and technical systems. This practice is typical for vertically integrated corporations in ferrous and nonferrous metallurgy (mine, ore processing, coke production, etc. - metal smelting, production of metal products), oil industry (oil production - transportation - processing - delivery), cement industry (mine, plant), nuclear industry, etc. (Sidorov, 2011).

With regard to non-associated enterprise (microeconomics), their innovative activity is often irregular, due to the small scale of production and resource constraints, especially in an economic downturn. The purpose of activation of innovative activity of such enterprises, and small businesses are subject to specific measures of the Federal government, and regional and local authorities. In this case, the emphasis in regulation of innovative activity are transferred from the sectoral to the regional level. The size of the national economy to stimulate innovation activity are the following measures: Tax incentives, tax holidays (deferred payment), grants for development of new technology and technological innovation, grants for advanced training of engineering staff, etc. (Faculty are authors of an article, won and implemented in 2015, the grant from the Ministry of education and science of the Russian Federation on training of civil engineers). In the regions and municipalities, together with tax incentives, the widespread creation of "business incubators" for venture capital firms, and start-up businesses, which reduced prices include rental of premises and office equipment, provided information and legal support. While the initial but very promising form becomes the formation of territorial and production clusters, which have been systematically regulation of innovation activities in the regions and settlements. Practice shows that in such a flexible, horizontally integrated structure on a contractual basis together mostly small businesses, allowing them to extract synergies from inter-firm cooperation in the use of machinery and equipment, implementation of marketing and integrated scientific-technical developments. Here, on the one hand, the effect of scale (Kleiner, 2013). On the other hand, the organizational flexibility of the clusters contributes to the high mobility in search of technical ideas and their implementation by connecting to the missing participants. Seems promising introduction in the Russian practice of innovation activity of international experience of forming scientific-industrial clusters at universities. While this form of communion of the scientific elite to productive activities in Russia is rudimentary form. Worth exploring and the question of forming the international scientific-production cluster with participation of professors, graduate and undergraduate students, as well as business representatives.

At the stage of acute needs for modernization technologies that increasingly felt in Russian economy, may become a very promising international cooperation Russian vertically integrated corporations and regional industrial clusters. This interaction will be beneficial both Russian businessmen and foreign partners despite the volatile economic environment; after all, a good captain keeps the sails in a storm, hurtling through the waves at double speed. (In the movie "Grand Prix" pilot supercar to the question about the secret of his victories says: "When the other throttle, I press on the accelerator." Is instructive for this topic).

5. CONCLUSION

In the economy of modern Russia, the effectiveness of innovations in engineering and technology largely due to a number of factors which are not always amenable to direct quantitative measurement, it is inflation expectations, the rate of turnover of invested funds, market conditions, production and technological specifics. Because of the complex nature of the impact on the production system the results of the updates of its individual elements - instrumentation, devices and apparatus, machines and mechanisms - is complicated by the determination of the technical and economic impact and commercial assessment of the viability of such innovations. This suggests the need to improve both direct and indirect methods of assessment of efficiency of production and innovations designed

to define a comprehensive (integrative) techno-economic effect of technological innovation in conditions of high volatility.

REFERENCES

Abalkin, L. (2002), The Logic of Economic Growth. Moscow: IE RAS.
Inshakov, O. (2013), The core of development in the context of a new theory of the factors of production. Economics of Contemporary Russia, 1, 5.
Kleiner, G. (2013), System Economics. Moscow: CEMI.
Popov, R. (2012), The Region's Economy: The Theory, Methodology, Methods: A Monograph. Moscow: High School Book. p432.
Prokhorova, V. (2010), Sub-regional resources and tools of intensive development of regional economic systems in Russia. Moscow: Publishing House of Moscow State University. p224.
Russian Static Yearbook, 2014. (2014). Moscow.
Sidorov, V. (2011), The theory of economic systems: Methodology, analysis of principles and basic concepts. Krasnodar: Research Institute of the Southern Federal District of the Economy. p425.
Ziyadullaev, N., Popov, R. (2015), Evaluating the effectiveness of scientific and technological innovations in the industry and capital construction in terms of volatility of the economic environment (Assessment of efficiency of scientific and technical innovations in the industry and capital construction in the conditions of the economic environment). Economics Building, 4, 17-23.