

Background, Principles and Terms of Innovation and Technological Development

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Abstract

Paradigmatic changes occurring and emerging in the transition to post-industrial society and then to the knowledge society, suggest the creation of a qualitatively new technological order, which basis should form modern industrial enterprises. Conversion of existing industrial enterprises in the post-industrial, competitive requires technical and technological its conversion and preparation of the modern scientific, technical and technological level professionals and managers, new structures and organizations. Assessment of the conditions of possibility of technological development of the country should be carried out with the necessary prerequisites, various positive factors, providing an opportunity of the beginning technological development in a fairly historically short time.

Keywords: technological development, economy, innovation, potential, state, progress, problems.

1. Introduction

Conceptual and methodological approaches to the elaboration of technological development of economy derived from the theoretical foundations and practical nature of the liberal-monetarist model of market reform, implemented over a number of years. Innovation and technological development is a result of the action of many economic, social and political factors. Action of these factors eventually realized in increasing the amount of resources involved in the production and improving the efficiency of their use as a result of technical innovation. General background of innovation and technological development are determined not only the socio-political choice, but also a number of other conditions (Boer, 2004).

First of all, in this regard, it must be said about the resource potential of the economy. The presence or absence of potential mass of resources (low-skilled labor, land, natural resources), excluding purely geographical factor, primarily depends on the real historical time in which the country lives (Solow, 1956). In the global economy now includes both those countries that have already passed the stage of industrialization, as well as those, a significant part of the economy of which is a traditional sectors with the extremely inefficient production. The resource potential of these countries - is the potential possible movement of resources in the modern sectors of the economy.

Even more important than the potential of massive resources is the relative place in the world that takes a country in creating new technologies and the production of new types of products. Already occupied earlier positions in the global division of labor, technological leadership constantly recreates itself.

2. Research Methods

Formation of modern conceptual and methodological base of technological development is multidimensional, and the reality of those or other prospects of technical and economic development ultimately depends on the general concept of economic transformation, the development of which is under the contradictory influence of many different factors. However, the current state of the economy makes it possible to identify some general patterns and methodological principles of technological development, the observance of which stems from the objective tasks of development of our country and its government regulation (Yakovets, 2001).

Structural methodology of studying any phenomena consists of the following main parts: basic principles, stages and methods of research and metrics. Undoubtedly, it is acceptable and in the study of innovation and technological processes. In this case, the methodological basis of elaboration problems of innovation and technological development is the method of materialist dialectics in the annex it to economic research in general, to the subject in particular. Definition

objective of technological development in the national economy in various sectors and economic areas can be provided by using a number of fundamental principles and, above all, the principles of complexity and system (Mensen, 1973).

3. Analyses of Recent Research

Technological development is not so much a goal as a means of forming a model of the economy, has the potential for long-term sustainable growth and capabilities in the future to solve the problem of improving living standards, achieving efficiency and competitiveness of the economy and national security.

Some progress in the economy, associated with the transition to a market organization of production, refers mainly to the superstructure areas of the economy, namely, the institutions and motivations. Thus, fact is a significant regress for the basic directions of scientific and technical progress, which include innovations and technologies and structural changes in the economy (Christensen, 1997).

Therefore, the primary task of technological development is to create mechanisms of coordination systemic change in our society. The core of such a mechanism is a system of national interests, values and priorities. Thus, pacesetters of the valuable core can be implemented in that case if it covers all areas of technological progress and affect the interests of all segments of society.

The value system should be oriented to the future. In this regard, our ideals and elected goals should have a much higher charge of attractiveness and evaluated much higher than today's realities. This means that the hierarchy of values cannot be limited only by democratic attributes of civil society and traditional values of our culture. In this hierarchy must take high place values related to the level and quality of life, economic growth, as well as technological progress in production (Pavitt, 1990).

Principle of priority of national interests should be the core of any economic and technological concepts (Mengel, 2007). The state should take the task of determining national targets, their priorities, sequence and timing of their implementation. In society, there are different interests, and those interests can act (to appear), as a goal, or limitations. All varieties of interests can be grouped into the following: the fundamental interests ensuring strategic stability and security, namely the condition of conservation science, the general conditions of its survival, conservation of the environment, preservation of population and the nation's health, preservation of intellectual potential. Development of the nation in the future should also be attributed to national tasks. This wide range of problems - from the multiplication of the intellectual potential of the country to the saving its own natural resources for future generations of citizens; outside interests, providing a purposeful development as the subject of the international community; domestic interests that form the basic conditions for the internal development of the country.

Depending on the duration of the analyzed period of development, these interests are fleshed out in the certain goals of economic policy. And these goals should be interconnected among themselves and with the resources they need, as well as the choice of forms and methods of using these resources for maximum effect with real-world constraints.

A key principle of the positive technological progress is an adequate understanding of the current market, with a new understanding of the interaction of planned program regulation and market. Existing fluctuations in the technical level could only occur in an economy where there was no inter-industry competition and where the distribution of resources between sectors was carried out as a result of: a) administrative appointment of the particular priorities; and b) the planned implementation of some mechanism for maintaining balance, more precisely overcoming imbalance generated by the adopted system of priorities.

The requirement for the transition to the market includes, therefore, not only to create an environment in which the capacity of individual enterprises increases, but also the conditions for competition between the different branches. The latter condition, however, can be realized only when the economy will gain market orientations, at least, only after it will be freed from foreign press. The transition to the mechanism of inter-industry competition - strong, may be the main motive of market reforms and principles of market innovation economy (Smith & Reinertsen, 1998).

The decisive principle of technological development as a whole is forecast for the development of the information sector of the economy, ie, those sectors of the economy where directly takes place production of scientific and technical information, scientific knowledge. Another important aspect of the technological structure of production is the forecasting of innovative processes related to the demand for scientific and technical information. These two aspects - forecasting of offer of scientific and technical information and aggregate social demand for it - are an important component of the state planning and forecasting not only of the information market, but also all the technological structure of social production (Saloman, 1984).

Government of all the developed countries of the world is making significant efforts to stimulate demand for

scientific and technical information from industrial enterprises, acting its main consumers in modern economies. In addition to tax and depreciation benefits, the state is taking deliberate measures to form appropriate macroeconomic prerequisites of the innovation process, under which conditions it can only improve.

In modern conditions the structure of social production cannot fully replicate the structure of needs. Absolute coincidence of it does not happen. This phenomenon has an objective basis, although the role of the subjective factor is not excluded. As shown by recent events, it is impossible without a deep socio-economic reforms, including in the organization of the world economy and labor division between the two countries, to solve such acute problems as the promotion of meeting the needs of the national economy in the equipment, technological processes. In this case, the most important criteria of efficiency of foreign economic relations are saving of labor and material resources, the acceleration of scientific and technical progress. In this regard, the most relevant principle of technology policy is the principle which realization will allow to use of foreign experience and technology policy model within reasonable limits. When developing model of technological development and use elements of leading countries technologies we must proceed not from the external features of the system, the external form, system of technological development defined by socio-economic system of the country but from deep internal relationships of the system. Borrowing of more developed technologies is a means of development of the system, including technology. But here it is necessary to bear in mind two issues: the correspondence of knowledge and expertise - licensees and the correspondence of technical level of production. Purchase a license and adaptation of the acquired knowledge and investments itself, promote the approximation to the technological leap, but in order to do it and go to a new stage of development, need additional knowledge created by own scientific potential (Manfroy, 2000). The transition to innovation and technological development can give the optimal result only under certain conditions and principles, which are as follows: firstly, the technology should be as knowledge-intensive. In the technologies used in the production, must be implemented new scientific knowledge. Without the active use of scientific advances in production technologies to put an end to backlog will be impossible. Second, when using modern technology radically changed attitude towards skills development. Man working on new and innovative enterprise - this is not just an employee, adapted to work on any one machine or type of equipment, and the employee on his qualifications approaching the engineer, by definition P. Drucker – ‘smart worker’ (Drucker, 1989).

4. Results and Discussion

Thus, it is clear that the current situation in global economic process in the context of globalization is characterized by fundamental changes in the supply of factors of production, technology, the structure of demand and interpenetration of innovation and the principle of international division of labor.

Now, when the task is to quickly and effectively adapt to changes in the global economy, these trends can not be ignored when predicting its future development. In the course of technological development of its economy account of all factors and specific features which can contribute to a more effective participation in the MRI became of vital importance. The successful solution of this problem is closely related to the search of domestic savings, improve access to external sources of financing-of, as well as the development of the social model of development capable of implementing these transformations (Moskvina, 2006).

Technological leadership gives absolute advantages associated with a relatively high compared to the costs, value added, which takes place in the first stages of the life cycle of new technology and new product. Relatively high amounts of added value (i.e., the opportunity not only to obtain high profits, but also to pay workers higher wages) are associated with the cost advantages of the first batches of new products, the sale of licenses and equipment for the production of new products. The country, which is connected to the release of new products and mastering new technologies in the final stage of their life cycle may already have more output, but significantly less contribution to the national product. Technological leadership is directly transformed into economic growth and is an extremely important monopolized resource of economic growth in the modern world (Nonaka & Takeuchi, 1995).

Consequently, the resource prerequisite for economic growth is not the communion of the new technologies as such but technological leadership, of course, not all, but at least in some important ways.

An important condition is the question of the relationship between technological and social systems. Thus, if in the long term, these relationships are positive, providing a self-generating process of development, in the short term, the relationship between them can be negative. Long-term orientation of the economy is accompanied by social tension that may adversely affect the innovation activity.

In the course of economic development the technological structure of production is constantly changing - some are replaced by new technology, in other updated composition of the staff and the structure of production assets. The

complexity of the problem lies in the fact that to achieve sustainable technological progress is required to determine not only the main directions in the first place, requiring the support of the state, but also a technological level that they should achieve. In all sectors of the economy, there are elements of several technological structures, they are intertwined with each other and are in a unique and close collaboration. Bet on the most advanced technological order, the main components of which are implemented in the most developed countries of the world, will require a radical modernization of production in all major industries and may be too devastating for the country. The support of the more backward technological orders will require implementation in production technology of past savings and thus program the technological backwardness of our country and the loss of a certain part of the scientific and technical potential that threatens to turn into a new wave of falling labor productivity across the economy. Therefore, in order to make the right choice requires a serious analytical work includes literacy feasibility study of decisions.

Choice of a leading priority technological order, for all the complexity of the problem, is crucial, as each technological order is a single intersectoral set of interrelated industries based on close by the nature technical and technological principles and solutions. Thus, each technological order, as an integrated system able to resist the introduction of alien productions and technological principles in a way, rejecting the elements of technological orders.

F. Aghion and P. Howitt (1992) also draws attention to another little noticeable factor explaining the emergence of the many obstacles for innovation in the situation of the free market. Those who introduce innovations are clearly aware that tomorrow's innovations eventually made obsolete today. This reduces the profitability of today's inventions and, ultimately works against innovation. Sadly, because the future inventions should be based on the current (Aghion & Howitt, 1992). Newton said: "If I have seen further it is only because I stood on the shoulders of giants".

Economic historian D. Mokyr (2003) says, the same forces that caused the world's first industrial revolution in England, later opposed further technical progress. This led to the fact that England lost to American technological leadership. English schools trained elite for certain professions, but not for science and technology. On the continent, on the contrary, the Germans introduced their Technische Hochschule (Mokyr, 2003). US spinning industry jerked forward with the invention of a new ring spinning technology, while Lancashire remained faithful to obsolete technology of spun yarn. After three strikes 1850s. Englishmen have banned the use of sewing machines for sewing shoes in Northampton. Workers in the arms industry in Birmingham resisted the introduction of advanced technology of interchangeable parts. British workers are also not allowed to introduce new equipment in the production of carpets, glass and metal.

Then something like this happened to America, which in 1970-1980-ies yield the palm of Japan. Now came the stagnation in Japan but America after the big shake-up again in the lead, even though the two countries are developing more slowly than a few decades ago, the conflict between the old and new technology can be seen as a conflict between the generations. Old people are trained to work on the old technology, and their qualifications can be rigidly attached to it. They have all the incentives to resist the introduction of new technology. Young learn that at the moment is an advanced foreign technology development, and they have incentives to enter this new, more productive technologies. Will there be technical progress depends on who holds a key position in management. In a democratic society, it may depend on demographic factors - that is, on what proportion of the population is elderly. And this, in turn, is determined by the rate of population growth. If they are high, the majority amounts to young people; if the population is growing slowly.

Academician Yaremenko (1967) in his work notes that there is a disintegration of technologies at the individual levels. The first level - a relatively advanced technologies focused on "the most important goals of socio-economic development", the other - on the "relative surplus of primary resources". It is a forms of extensive technology associated with traditional values and intensive, gravitating toward liberal values. Their relationship is determined by the fact that the technology of the lower levels can "contain qualitative growth in its upper part". In this situation, the "new technologies can serve as a barrier to the next revision of the socio-economic priorities, to detain a regular shift in the technological and industrial structure of the economy".

There are several reasons aggravating the crisis situation in the technological sphere. We mention only two. First, today the real share of spending on scientific and research works almost fell to a critical level, beyond which there are destructive changes, the collapse of infrastructure and the degradation of the entire system. Similar rates today in Japan is 3%, the United States - 2.5%, France - 2.5%, Germany - 2.3%. It is known that the irreversible destruction of scientific and technological potential begins when the amount of budget funding of science and science-intensive technologies falls to 0.3 of GDP (Science, Technology and Industry Scoreboard, 2005).

Secondly, under the administrative-command system, the main part of the scientific potential has been involved in the maintenance of the old technological order. Obviously, science has not been able to offer the technologies needed for economic recovery on a new technological basis. However, the crisis in science, in contrast to the social and economic crisis that adversely affect the science leads to a revision of paradigms, generation of new ideas, hypotheses, theories that form the core of future scientific revolution. Science and technology policy of the state, as a rule, is carried out in a

three-pronged policy: science policy (setting priorities and stimulating scientific and social issues in public research institutes and universities), technical policy (implementation of complex public R & D programs, the creation of technological systems and technologies), industrial policy (stimulation upgrade and increase the efficiency of production capacity).

5. Conclusions

UN conference in Rio de Janeiro in 1992, adopted the agenda for the XXI century. In this document, the development strategy of the international community in the XXI century is defined as the transition to sustainable development through a balanced solution to the economic, social and environmental problems. For the first time clearly marked general and specific problems of survival, environmental security and sustainable development of civilization in a single global ecological space of planet. Most countries in the world by signing this document, marked the beginning of a new global partnership for sustainable development.

The most important direction of sustainable development is the rationalization of the use of the totality of resources. It is rich in mineral reserves, a fairly well developed compared to many countries production and economic potential, high educational level of the population, qualified personnel (Barlybaev, 2006, 2003)

In the block with the socio-economic policy require their immediate resolution and the accumulated environmental problems (Molitor, 1999):

- land degradation and impoverishment of landscapes (more than 60% of the country is prone to severe desertification);
- water; scarcity;
- high degree of pollution of air, soil and water;
- decline of biodiversity.

Effective solution of these problems can contribute not only to the conclusion of the ongoing socio-economic crisis, but also to create conditions for achieving sustained development. It appears that attempts to solve the contradiction between technological development and the interests of preserving the environment, methods of achieving them by linear contrasting market and state regulators cannot be successful. Only surround vision of the problem of ratio of macroeconomic regulation and market allows us to find an effective combination of technological development and ecologization. The key of approach is to find forms of implementing the diverse interests of society. That is real interests in relation to the technological development should make models for sustainable socio-economic development.

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