INNOVATIVE COMPONENT OF ECONOMIC DEVELOPMENT

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Abstract: The article is devoted to the assessment of potential for innovation in Ukraine and its condition comparing with others countries’. Author identifies and classifies main problems that negatively influences on innovation development of Ukraine. The features and interlink of the main factors of ecologically-focused economic development and green innovations are investigated and presented in the cognitive model. Formalization the causal links between industrial development and green innovations is the basis for the study of mechanisms of their interaction and the drawing-up of appropriate instruments of sustainable development. It is proposed the specific priorities and measures to stimulate ‘green’ innovation development at three levels – macro-, meso- and microlevel.

Keywords: economic development, innovation, economy of Ukraine, industrial development.

Introduction

Ukraine has a highly developed scientific potential, capable to solve actual problems in social development and modern innovative tasks. Ukrainian human resources are of high quality - there are more than 20,000 PhD; the number of students in higher education institutions is more than 1 million. Ukrainian R&D sector is represented by 1,208 institutions. Solid educational system provides a basis for further development of the innovative capacity of country. But there is a discrepancy between scientists’ human, technological potential and the overall productivity of Ukraine economy due to the undeveloped national innovative system. The qualitative estimation of R&D sector shows that Ukraine has low level of innovative activity, high-tech production and investment in science. In comparison with leading countries, Ukraine’s involvement in the knowledge-based economy is still insufficient. By the Knowledge Economy Index calculated by World Bank Ukraine is still behind majority of the Central European states. In 2012, Ukraine ranked the 56th out of the 145 countries. According to the Global Competitiveness Index, Ukraine ranked the 73rd out of the 144 countries in 2012-2013. Regarding innovation Ukraine ranked the 71st.

In order to ensure sustainable dynamic growth of national economy, it is important to transit to an innovative type of development and to build knowledge-based economy. Innovation is the critical dimension of economic change; “economic change revolves around innovation, entrepreneurial activities, and market power” (Schumpeter, 1982). The governing factor of economic development is innovations rather than capital (Solow, 1957). Ukraine requires dynamic economic development through innovation, deep and comprehensive modernization of the economy and society (Heyets and Seminozhenko, 2008). But despite of official declaration on introduction of innovative development model and a number of normative acts regulating innovative activity, Ukraine was not capable to create institutional conditions for dynamic innovative development, including in the public innovation management. Till nowadays there is no functioning system of technology transfer and supporting of innovation development in Ukraine. At the central level there are a lot of institutions that engaged in the strategic development of innovations, but dividing responsibilities between them is unclear; logical conception of promoting innovation processes and transfer of technologies is absent. Therefore, Ukraine is missing a major opportunity to facilitate industrial modernization. Ukraine economy is not on a sustainable growth path yet, which should rely on investment, knowledge and innovations. Presently Ukraine has limited resources but at the same time pretends to rank as a country with hi-tech industry. To resolve this paradox, it is in urgent need to define main problems and to develop strategies, which will include priorities and ways of supporting innovative enterprises.

Ukraine has got serious problems with air-, water- and soil pollution caused by the inconsiderate interaction between man and nature. So a very important task is to identify an effective ways of promotion...
green growth by encouragement of business investment and innovation. Achieving goals for economic growth and environmental health will require widespread of ecologically-focused innovation and implementation of new and appropriate “green growth” technologies. That’s why we should pay attention to the study of the potential for green innovation in Ukraine, challenges and priorities in the sector of research and innovation in line with green economy standards.

The aim of the article is to estimate the innovation performances of Ukraine economy and enterprises; identify main problems which restrain innovative activity and to develop priorities aimed at strengthening competitive advantages of Ukraine, especially taking into account necessity of transition to ecologically-focused industrial development. The methods of research are systematic and comparative analysis of scientific literature and statistical information. Analysis and synthesis technique is used to detail measures on strengthening innovation orientation of Ukraine economy.

Results

Analysis of Ukraine transition toward market and knowledge based economy shows that economic growth and the achievement of successful solutions to contemporary economic problems depend on the level of innovative development. In 2013, Ukraine placed 71st by the Global Innovation Index. In 2013, Ukraine’s overall ranking represents a decline of 8 places compared to the 2012 ranking of 63rd. Ukraine is ranked 131st under knowledge & technology outputs subindicator; relatively low ranking was largely attributable to weaknesses identified in the knowledge creation, knowledge impact, knowledge diffusion, state regulation, economic situation, ecological sustainability. However, the report also identified strengths in some key areas, including institutions and human capital. Ukraine is ranked 33rd under the institutions pillar due to improvements in the business environment, particularly regarding the easy of starting a business. These strengths and weaknesses are reflected in a lower ranking of 83rd on the innovation input sub-index, which measures elements of the national economy enabling innovative activities, and a lower ranking of 58th on the innovation output sub-index, which measures the results of innovative activities including the number of patent and trade mark application filings. This indicates that Ukraine has all the necessary ingredients for a highly innovative knowledge-based economy and high-tech manufacturing, but there remains place for improvement in realizing and commercializing of intellectual property.

In the modern market economy enterprises play the key role in solving major economic problems, setting up the sustainable production of goods and services. Ukraine suffers from a low level of innovation activity in production. The proportion of innovative enterprises in the industrial sector declined from almost 30% in 1994 to approximately 13.6% in 2012. In 2012, 1758 companies (17.4%) carried out innovation activities, in 2011 – 1679 companies (16.2%), 2010 – 1462 enterprises (13.8%). Over 2009-2011 years the total cost of innovation has been growing steadily, but in 2012, this figure decreased by 1.2 times compared to 2011 and amounted to 11480.6 million UAH. The data analysis shows that purchase of machinery and equipment associated with introduction of innovations, as well as research and development are most financed. Innovative investments have become ‘more diversified’ over time. The share of investment in new equipment has dropped since 2000 but the share of organizational innovation in comparison to total investment has almost doubled. At the same time, enterprises spend less on their own R&D and more on the purchase of new technologies from external sources. The weakness of the Ukrainian banking system, combined with high interest rates and lack of state support to financial institutions that assist innovation activity, forces innovative enterprises to be financially self-reliant. Innovation financing, especially at the very early stages of company development, is virtually non-existent in Ukraine.

A calamitous reduction of funding for scientific research occurred during the period of market transformation including a cutting down of funds for research equipment. The main source of innovation financing is enterprise’ own funds. Business effort in R&D and innovation is however higher than the state effort. In 2012, the total government research budget accounted for 2% (1% in 2011) and amounted to 224.3 million UAH. In 2012 a share of enterprises’ own funds, directed to finance innovation activity, was 63.9% of total financing and amounted to 7335.9 million UAH; in 2011 it was 52.9% (7585.6 million UAH). Thus, the insufficient financing is the reason of low level of innovative activity of enterprises, and on the other hand - it can be considered as the consequence of low level of Ukraine‘ innovative development.

A characteristic feature of current innovation policy in Ukraine is the expressed intention to exploit scientific technological innovations for the purpose of economic growth, but, in reality, this policy has not been implemented. The government innovation policy is predominantly focused on the managing process.
rather than final results. Duties, responsibilities and competencies in the Ukrainian governance sector regarding innovation can be described as fragmented and ineffective. Despite the existence of numerous state agencies and bodies, the state innovation structure is subject to permanent changes. Furthermore, a number of ministries, especially the Ministry of industrial policy and the Ministry of economic development and trade, are operating in the innovation sector and sometimes compete for competencies with the State Agency on Science, Innovations and Informatization. In addition to this, it becomes obvious that the Ukrainian legal system is not harmonized. The main problem of normative documents is that, usually, they do not contain practical steps, supported by financial resources and organizational measures. At the same time, all legislative documents rightly stress the importance of creation of adequate institutions for the development of innovation activity. Most of these documents have quite a declarative character, with no financial back-up and other mechanism for promotion of innovation activity.

Lobbying groups can stop implementation of the most important clauses of the laws, which are aimed at innovations support, with the help of the Budget Law. The bureaucratic approach blocks innovative methods. In addition to this, innovation-related programs are numerous, and in the past it is difficult to raise funds for their implementation. Even the scanty resources that are allocated normally get diffused, which decreases economic incentives and stifles the work of the best components of Ukraine’s scientific, techno-logical, and industrial potential. A reduction of the number of programs might improve the situation as it will help to concentrate the financial means in few efficient programs.

Lack of financing and weak orientation of the financial system to support innovation activity lead to the fact that existing infrastructure is used insufficiently and many good ideas remain only on paper. Science parks, technology parks, innovation centres are too little developed or in fact do not exist. Not enough activities are undertaken to make the existing centres or conceptualized projects attractive for foreign investments. Such situation and government policy negatively influences innovation development in the regions. For years regional authorities had little resources for any special innovation support activities. Even though some administrations (e.g. Kiev and Donetsk region) have special departments for the support of science and technology innovation, not all of them have allocated financial means in their budgets for this purpose. Development of innovative activity in the different regions of Ukraine is extremely uneven relating to the level of development of innovative infrastructure. Recently several regions have started to pay more attention to the problems of innovation development, although this attention has not been accompanied by effective practical measures. Several regions have prepared new Conceptual papers on innovation development; some regions have included an ‘innovation dimension’ in their regional development programs.

Lack of direction in modernizing the national economy and insufficient incentives for developing the high tech sectors are key problems for the country. The second group of reasons, which explain poor innovative performance, is related to the unfavourable business environment. Innovation can emerge from new technological and non technological knowledge. According to the data of the Global Competitiveness Report, in 2012-2013 Ukraine ranked 80th among 144 countries which were surveyed by the number of latest technologies and only 91th by the level of business sophistication. Among the causes of such gap is underestimation of the importance of strategic management to be governed by the goals of improving productivity and stepping up the value chain. Processing of entrepreneurs survey and analysis of different research in this sphere resulted in systematization of the main problems which restrain innovative activity in Ukraine (Figure 1).

The actualization of the “knowledge factor” as a solution to the general problems of economic growth is very important especially in the transition to ecologically focused economy. As stated above the need for development of affordable and safe ways of addressing global climate challenges and Ukrainian environmental problems has never been more pressing. Such challenges have resulted in increasing attention being paid to new technologies, and their application in new ways. But in 2012 production of 3403 new types of products was mastered, 2188 new progressive technological processes were introduced and only 554 of them were waste-free and resource-saving (figure 2). Implementation of energy efficient and resource saving, low waste, waste-free and environmentally friendly technological processes is one of the main challenges of improving the environmental situation in Ukraine. The use of low-tech industrial processes with ignoring their impact on the environment caused the modern ecological crisis in Ukraine that has led to a deterioration of human health and increasing its mortality. Therefore it is very important for sustainable development of Ukraine to search effective mechanisms to encourage technological innovation and activation of innovation and investment activity of industrial sector.
Green innovation is one such new ways of addressing global challenges. Green innovations reduce environmental impacts: by increasing energy efficiency, by decreasing waste or greenhouse gas emissions and/or by minimizing the consumption of non-renewable raw materials. Ukraine is seeking new ways to use green innovation for increased competitiveness through a transition to a so-called “green growth scenario” based on the application of ecologically focused innovation.

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**Fig. 2. Dynamics of introduction of new technological processes at the industrial enterprises in Ukraine.**
Eco-innovation is a product of joint use of intellectual and financial capital (represented by appropriate personnel and investments) (Figure 3), the effective use of which is the key to the successful implementation of eco-innovation model of industrial production. Formalization the causal links between industrial development and green innovations is the basis for the study of mechanisms of their interaction and the drawing-up of appropriate economic models and instruments of sustainable development.

![Cognitive model of interaction between objects of ecologically focused management of industrial production development](image)

Efficient innovation policy for promotion green innovation should provide an effective mechanism of investing into crucial structural changes for the benefit of productions of the fifth technological paradigm. For innovation to be more effective, it must be manageable. At present, Ukraine does not have a full-scale multi-level governance of ecologically-focused innovation development, which leads to an uncertainty of national and regional innovation policy. Priority measures on strengthening competitive advantages on the basis of innovative factor in Ukraine are:

- creation of favorable legal, economic and organization conditions for development of scientific and technical as well as “green” innovative activities;
- promotion of integration of science and industry;
- formation of the infrastructure for entrepreneurship support in the scientific and technical field;
- reinforcing human potential with the objective of improving the capabilities of persons involved in R&T and eco-innovations.

Increasing the innovative activity of the existing industrial enterprises is one of key aspects of innovative policy, as innovations provide competitive advantages to business. Innovation infrastructure requires attention and improvement. The integrated development of innovative entrepreneurship in Ukraine requires action at three levels. At the strategic level (macrolevel), there is a need for the creation of favorable legal and organization conditions for innovation development. This requires:

- improvement strategies, policy and regulation of innovation activity at national level taking into account necessity of transition to ecologically-focused industrial development;
- development of the system of tax and customs benefits for innovative enterprises based on the European experience and best practices examples from the neighboring countries. The benefits may be the following: exemption from dues and taxes to the state budget and non-budgetary funds; income tax; value added tax; customs dues or lower individual income tax for local employees;
- funding of innovation programs or projects aimed at groups of innovation stakeholders with the objective of improving cooperation and collaboration and thereby the functioning of the innovation system.

At regional level (mesolevel), there is a need for organization of communication platform and professional dialog among state authorities, science and business, the strengthening of infrastructure to promote innovations, including:

- improvement of strategies, policy and regulation of innovation activity at regional level;
• development and introduction of strategies for “science city;
• support in creating new innovative structures; support to clusters development;
• promotion the involvement of creative youth in scientific activity;
• promotion of cooperation among small, medium and large companies in knowledge-innovation development; development of the existing and new instruments of innovations support;
• reinforcement of exchange of research personnel within the joint projects and promotion of the participation of regional scientists in international forums;
• establishing, developing and maintaining information support systems for the entire cycle of innovation activity (web-portals, TV broadcasts, advertising) with emphasis on ecologically-focused innovations.

At the microlevel, there is a need for the improvement of organizations capabilities. This can be achieved by:
• professional trainings for strengthening entrepreneurial and managerial skills;
• development of a network of regional innovative scientific institutions, uniting inventors and investors;
• stimulation of entrepreneurial activities of students, graduates, staff members;
• support in transferring know-how, technology and expertise from one industrial sector to another, as well as transfer R&D results to the market; support to development of market for ‘green’ goods and services.

To make production development environmentally safe and sustainable there is a need for a package of government investments, fiscal incentives, political reforms and price formation reforms, aimed at transition to ecologically focused green economy, creation of adequate infrastructure and promotion of employment in transformed economy sectors. It is necessary to employ the research and innovation potential of Ukraine in a more efficient way, bring up to the introduction stage those technologies which are related to the use of renewable materials and energy sources as well as reduction and prevention of emissions and wastes, their processing and treatment etc.

**Conclusion**

A characteristic feature of current innovation policy in Ukraine is the expressed intention to exploit scientific technological innovations for the purpose of economic growth, but in reality this policy has not been implemented. One of the reasons of it is incorrect theoretical and practical approach according to which transitive economy with a high industrial development can occupy the old industrial niches within international trade. But only expansion of new modern branches (including green spheres) and forming of more innovative structure of production will allow to guarantee a stable ecologically focused economic growth for Ukraine. Supporting the innovation activities is the main way to overcome stagflation which causes many problems for Ukraine economy. The complex of questions relating to setting up legal and institutional mechanisms for stimulating national investment in technological "green" changes must become a priority for the legislative and executive branches of government.

Ukraine has a considerable innovative potential, because of its previous level of economic and industrial development and of its education system. It has also some specific advantages in particular sectors of industry. But Ukraine will only benefit from these advantages if the approach to the research and innovation development is improved and the challenges currently hampering modernization are tackled. Successful implementation of eco-innovation model of industrial production is possible if Ukraine pay more attention on introducing green innovations and socio-economic transitions to enhance an environmentally sustainable economy and this will solve structural resource scarcity and environmental problems.

**References**