

# Ukraine's Priorities in Developing Innovation in the Context of Eurointegrative Processes\*

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ANNOTATION. In the article the author substantiates the need to pursue more energetically international innovative activity to raise the competitiveness of the national economy. Evaluating the current status of Ukraine's innovation potential as compared with the EU countries, the author identifies the strategic priorities as well as institutional and financial mechanisms for building up the national innovation system. Expressed is the need to devise and implement measures to facilitate the interaction of Ukraine's national innovation systems with those of the EU member countries. The author formulates proposals for concentrating international industrial and scientific-technological cooperation in a limited number of high-tech sectors.

KEY WORDS. Innovation development, competitiveness of the economy, Eurointegrative processes, transnationalization of innovation activity, adaptation of innovation policy, innovation potential, institutional support of Eurointegration.

## Introduction

Ukraine's inclusion in the world's economic space and the creation within the country of long-term conditions for uninterrupted economic growths calls for the need to build up and use efficiently its innovation potential and extend opportunities of its materialization while deepening the integration of the national economy into the world and regional structures.

This is necessary to achieve the strategic bearings of a new paradigm of Ukraine's foreign economic strategy, to qualitatively change Ukraine's specialization in the division of labor by raising the share of exported innovation products with a high added value, and to increase the provision of high-tech services. Against the background of a substantial increase in the commodity flows between Ukraine and the EU, it is necessary to put to use the innovation potential of Eurointegration and raise the national economy's competitiveness as the main precondition of its successful adaptation to harsher competition after the country accedes to the WTO.

A higher level of international competition requires an accelerated qualitative and quantitative economic development of the country. Its underlying foundation is the innovation potential of Eurointegration, which will enable

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\* This article was translated from its original in Ukrainian.

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Ukraine to bear the competitive pressure both within the European economic space and on the world markets of science-intensive, high-tech products. The prospects of Ukraine's continued integration into the EU should take into account the possibilities of the competitive national innovation potential and its interaction with the European and world innovation environment on mutually beneficial terms.

### **Degree of Elaboration of the Issue and its Unresolved Elements**

The issues of the international innovation cooperation of Ukraine and the EU have been extensively treated in the works of such Ukrainian scientists as L. Antoniuk, O. Bilorus, V. Budkin, O. Havryliuk, O. Hrebelynyk, B. Hubsy, M. Dudchenko, D. Lukianenko, V. Sidenko, Y. Pakhomov, A. Rumiantsev, A. Portnov and T. Tsygankova.

But in the numerous informative publications unjustifiably little has been said about the key issues of Ukraine's innovation development in the context of Eurointegrative processes. This concerns the analysis of Eurointegrative processes, the study of the motives of transnationalization of innovation activity, and the conditions of formation of a long-term system of Ukraine's innovation cooperation with the EU countries.

To a considerable extent the unsatisfactory state of elaboration of our country's priorities of innovation development is explained by the inadequate evaluation of Ukraine's current innovation potential and the incomparability of its component parts with identical characteristics of the EU innovation potential. This makes it impossible to clearly identify the leading trends in the development of the national innovation systems as well as the conditions of their integration within the limits of the EU and in the technological and economic environment of the world. Among the unresolved elements of the priorities of Ukraine's innovation development is the lack of a substantiated mechanism of materializing the innovation potential of Eurointegration by strengthening the government's regulatory role in the institutional backing of transnationalization of innovation activity and identifying the strategic areas of activity that would be capable of heightening the effect of the Eurointegrative processes in the long run.

### **Correspondence of Ukraine's Innovation Development to the Eurointegration Intentions**

The purpose of this article is to reveal the possibilities of uninterruptedly building up international and regional cooperation that enables countries-participants to derive competitive advantages in the world economic environment for account of the effect of the scale of innovations, their best possi-

ble commercialization, and reduction of costs for R&D in an individual country.

In the opinion of the author, the main flaw in the existing mechanism of identifying the priorities of Ukraine's innovation development is the concentrated attention on designing and endorsing priority programs without proper consideration of international innovation cooperation and a lack of adaptation of innovation policy to the requirements of the countries-partners. The priorities of innovation development should be of a mutually complementary, integral nature and reflect not only the strategic objectives of raising the technological development of the national economy, but also the possibilities and advantages of technology transfer whose acquisition costs or effect from the transfer provides an additional effect as compared with their use only within the limits of the national economy.

Judging from the analysis of foreign experience, the integrative processes, globalization and internationalization of world economic relations are affecting ever more the events in the economic system and socioeconomic development of individual countries. During the past two decades, and especially since the beginning of the new millennium scientific ways have been sought to invigorate international innovation integration — the creation of the best possible structure of a world and regional innovation system through the employment of joint intellectual capital, investment, financial and production resources, introduction of mechanisms and state and inter-state regulation in order to achieve the joint objectives of enhancing the competitiveness of the economy as well as ensuring sustainable economic growth and social progress.

A distinctive features of innovation cooperation of the developed countries is the high motivation of business entities, primarily transnational corporations (TNCs), as well as powerful financial institutions to enlarge the sales markets of high-tech products, to distribute R&D between different countries (because of their growing complexity and cost), and to invest<sup>1</sup>. The integration of technologies promotes the enlargement of the areas of use of the advantages in division of labor and, given the global nature of modern technologies, it promotes the internationalization of economic activity.

For countries with an insufficient level of economic development, international innovation cooperation opens broad opportunities to use their own innovation potential as well as the achievements of science and technological progress of other countries. According to the cyclic theories of economic development, long-term economic cycles are associated with the processes of convergence and divergence in science and technology. The gradual distribution of the achievements of scientific and technological progress (STP) be-

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<sup>1</sup> *Upravlinnia mizhnarodnoiu konkurentospromozhnistiu v umovakh hlobalizatsii ekonomichnoho rozvytku*. [Management of International Competitiveness under Globalization of Economic Development. Monograph in 2 vols. Vol.1 edited by D.Lukianenko and A.Poruchnyk. Kyiv, National University of Economics of Kyiv (NUEK), 2006, pp.633-635].

tween countries promotes the convergence of economic and social development, which is one of the most important factors of stimulating integrative processes.

In economic literature there is a lack of unanimity about the positive implications of integration in science and technologies. According to the assessment of V. Inozemtsev, technological progress in the developed countries is becoming more and more a factor of disintegration when property inequality is increasing in dimensions hitherto unknown in history<sup>2</sup>.

In our opinion, this viewpoint needs certain clarifications. Indeed, under the influence of globalization the economic complexes of national economies tend to lose their integrity, setting ever more their sights on the world economic space. In this manner the dependence of the innovation-technological factors of development of one country on others increases. The countries with a higher developed innovation system as well as scientific and technological developments or with a denser system of scientific-technological relations enjoy advantages in materializing their innovations.

The dangers that arise with globalization do not mean at all that one or another country refuses to participate in the international division of labor as regards the manufacture of science-intensive and high-tech products. An economic autarchy blocks the development of productive forces, making countries lag behind the world achievements in science and technology. The negative impact of outpacing technological progress in the developed countries requires the formulation of a corresponding integrative policy of the less developed countries as well as the use of mechanisms and instruments of international innovation cooperation. By its nature and depth of impact on individual national economies as well as on the entire course of world economic development the evolution of international innovation-technological relations is rather contradictory.

As a component part of the economic integration of countries, this process foresees a higher degree of openness of national economic systems as well as mutual benefits from investment and innovation-technological liberalization. The general economic benefits from the openness of national markets consist, first, in the development and strengthening of the countries' competitive advantages that are achieved by increasing the volumes and raising the efficiency of use of natural, human, industrial and financial resources, and, second, in gaining an effective stimulus of economic growth (effective competition) by deeper involvement in international trade. It goes without saying that in the structure of foreign trade there must be a major share of high-tech products, which, in the first place, provide for the benefits from the openness of national markets. Moreover, deeper in-

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<sup>2</sup> *Neizbezhnost postindustrialnogo mira. K voprosu o polyarnosti sovremennogo miroustroistva. Postindustrialny mir i Rossiya.* [V. Inozemtsev. The Inevitability of the Post-Industrial World. A Proposal on the Polarity of the Modern World System. *The Post-Industrial World and Russia*. Moscow, 2000, pp. 84-104].

egrative processes intensify foreign investment and shape an efficient market through human assets growth. The countries that have not yet claimed their place as high-tech countries on the world market are faced by the problem of aligning the requirements and interests of national development with the processes of globalization and internationalization of investment-innovation activity<sup>3</sup>.

The place and role of innovation policy in government regulation of the economy is determined by the specifics of the innovation process as an object of administration, which, much more than the STP, is related to commodity-money relations that impact on all the stages of its materialization, investment and financing, as manifested in the developed countries. In the latter, private companies translate the bulk of the innovation processes into reality. Such processes are not an end in itself, but a method for the best achievement of manufacturing and commercial objectives of companies that want to gain high profits.

Under such circumstances innovation is aimed right from the outset at achieving commercial results. The very idea that serves as a spur is of a mercantile substance, but not the result of «pure science» gained by university academics in a free creative quest. The practical aim of an innovative idea is the attractive aspect for companies, especially TNCs, which are capable of quickly achieving their technological leadership and deriving competitive advantages on the world markets. For TNCs the *raison d'être* for invigorating innovation activity is to reduce cost value to enhance the competitiveness of their products for account of international interaction of manufacturing and economic processes and maximum use of the markets of foreign countries.

### **The Innovation Potential of Ukraine's Eurointegration**

Among the motives that induce integration the leading place is held by the desire of every country to use as much as possible its own innovation potential as well as the potential of the countries with which more active international cooperation is effected. Integrative processes are the more intensive as international competition increases and the forms of world economic relations develop. The underlying foundation of modern competition is knowledge, scientific and technological factors, information technologies, and, most important of all, an economy's capability of quickly and effectively using the achievements in science and the latest in technologies on the widest scale. This transforms the innovation potential of the integrative process into a principal moving force in the development of the world economy and accentuates

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<sup>3</sup> *Stratehia ekonomichnoho rozvytku v umovakh hlobalizatsii: Monohrafia* [Strategy of Economic Development under Globalization: Monograph. Edited by D.Lukianenko. Kyiv, NUEK, 2001, p.11]. Глобалізація і економіка України. — К.: Логос, 1999. — С. 24—28. (*Hlobalizatsia i ekonomika Ukrainy*. [Globalization and Ukraine's Economy. Kyiv, Logos Publishers, 1999, pp.24-28].

for a lot of countries (to which Ukraine can be referred) the issue of membership in one or another integration association.

In the general understanding, the term *potential* (from the Latin *potentia* — power, potency) means an aggregate of capacities, reserves and methods that can be used under certain conditions. In economic literature, the term *potential* is used to describe the aggregate of a country's resources and possibilities (economic potential) and to reveal its aggregate intellectual and material resources that are used to conduct research and experiments, their results being brought to a developed level and introduced into production (scientific-technological potential), or else to describe the resources of an individual enterprise, sector, or region.

According to Article 2 of the Law of Ukraine *On the Priority Areas of Innovation Activity in Ukraine*, innovation potential is defined as an aggregate of scientific-technological, financial-economic, manufacturing and cultural-educational possibilities of a country (sector, region, enterprise, etc.) that are necessary to ensure the innovation development of the economy». <sup>4</sup> But this definition of the essence of innovation potential is not generally accepted.

Some authors see the essence of innovation potential as «a certain amount of information about the results of scientific-technological developments, inventions, R&D, samples of new machinery and products<sup>5</sup>.» In our opinion, such a definition is narrow and equates the innovation and scientific-technological potential. But science and scientific-technological activity only produce innovations and do not reflect the entire structure and substance of the innovation potential. Other authors interpret the innovation potential as «a system of factors and conditions required for the innovation process,<sup>6</sup>» thereby confining this concept within the limits of innovation activity as well as rejecting its interdisciplinary nature and narrowing its sphere of application. In the definition of the innovation potential as «the ability of sectors of the national economy to manufacture science-intensive products meeting the requirements of the world market,<sup>7</sup>» the entity that is evaluated (namely, different sectors of the economy) is precisely stated, linking the term with a sector and the national economy as a whole. In many cases, the category *innovation potential* does not have a clear definition at all as well as the

<sup>4</sup> Law of Ukraine *On the Priority Areas of Innovation Activity in Ukraine* of January 16, 2003, No.433-14. *Holos Ukrainy* [Voice of Ukraine] newspaper, No.28, February 13, 2003].

<sup>5</sup> *Innovatsiyny potentsial u promyslovosti Ukrainy*. [Innovation Potential in Ukraine's Industry. *Economist* magazine, 1999, No.10, pp.26-32].

<sup>6</sup> *Innovatsionnoye razvitiye i innovatsionnaya kultura*. [A.Nikolayev. Innovation Development and Innovation Culture. *Science and Science Policy Studies*. 2001, No.2, pp.54-65].

<sup>7</sup> *Rynok: Business. Kommertsya. Ekonomika: tolkovy terminologicheskii slovar*. [Market: Business. Commerce. Economics: explanatory dictionary of terms. Compiled by V.Kalashnikov, edited by A.Dashkov. Fourth edition, revised and supplemented. Moscow, Marketing Publishers, 1998, pp.403].

methods of its evaluation<sup>8</sup>. There is a viewpoint that essentially equates the economic and innovation potential, defining this phenomenon as «containing latent possibilities of accumulated resources which can be put into operation in order to achieve the purposes of the economic entities<sup>9</sup>. This is an attempt to limit the definition of the term only to the microeconomic level.

The diversity of the identifications of *innovation potential* requires a fundamentally new approach to its essence. In our opinion, an innovation potential can be presented at the macroeconomic level as a system of indicators comprehensively reflecting not only the quantitative parameters of the results of individual components of the innovative process and the status of the object of analysis (in particular, GDP per capita, share of gross added value, the economy's technological readiness, etc.), but also as a foundation for revealing the essence of the quantity of real processes and phenomena related to support of innovation development. The integration of the quantitative evaluation of the innovation potential into the qualitative parameters of an economic system as well as the institutional, financial and legislative support of its use make it possible to adequately represent the existing situation in the innovation area and analyze the economic relations, processes and trends of innovation development. Thus there appears a methodological basis for revealing the ability of a national economic system's receptibility of innovations and the use of the technological, economic and market effects from the introduction and commercialization of the achievements of science in social production. At the same time the system of these indicators makes it possible to identify the global competitiveness index evidencing the efficiency of the operation of a national economic system in the world.

The innovation potential reveals a country's sources of development and its ability of mutually beneficial international economic cooperation. Diffusion of innovations achieves the effect from their duplication, which increases much faster than the duplication of innovations itself. Therefore it can be argued that all phenomena and processes resulting in innovation development have an innovation potential, thereby ensuring a close link between today and tomorrow, the current and long-term development.

The existence of a latent potential does not mean it has a static status: it is capable of accumulating and dynamically developing on its own in the course of its materialization. In this manner an innovation potential can generate a long-term effect in a country's economic development and at the same time create an innovation component of the global integrative process, as represented in Figure 1.

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<sup>8</sup> *Formirovaniye potentsiala innovatsionnogo razvitiya*. [M.Gusakov. Formation of the Potential of Innovation Development. *Economist*, 1999, No.2, pp.3-38].

<sup>9</sup> *Nauchno-technicheskiy potentsial: struktura, dinamika, effektivnost*. [G.Dobrov, V.Tonka, A.Savelyev et al. Scientific-Technological Potential: Structure, Dynamics, Efficiency. Kyiv, Naukova Dumka Publishers, 1987, pp.347].

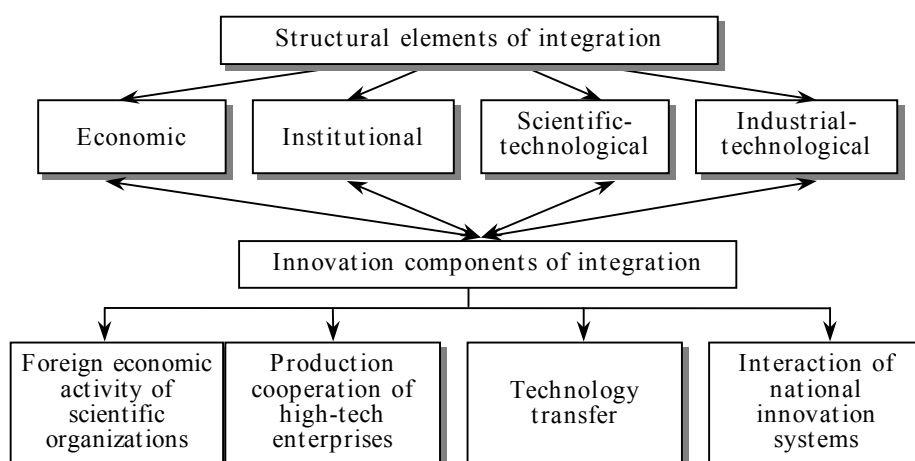


Fig. 1. Place and structure of innovation components in the integration process

The innovation potential of integration consists in the ability to harmoniously combine scientific-technological and resource possibilities and use the integrated innovation potential at the micro, macro, mezo, regional and global levels for the development of joint innovation activity between individual economic entities; for targeted innovation activity between related sectors and types of production; for executing joint innovation-technological projects to expand production and sales of high-tech products, to increase international distribution of labor and on its basis enhance the competitiveness of national economies, and to deepen their interaction in the process of implementing strategies of international and regional innovation activity.

In characterizing the scientific-technological and innovation potential, Ukrainian statistics use data about the number of scientific organizations and their personnel, funding of scientific-technological works, the material plant of organizations, the results and foreign economic activity of scientific organizations, the innovation activity of industrial enterprises, as well as patenting and licensing activity. When making international comparisons and determining the role of the innovation potential in the integration of economic systems, it is necessary to design a system of indicators describing its status and development in order to provide a quantitative measurement and analytical evaluation of the potential. Some steps in this direction have been made by the World Bank, the Organization for Economic Cooperation and Development (OECD) and the European Union.

In 2001, a system of indices evaluating innovation activity was adopted and endorsed as a standard in the countries of the European Union<sup>10</sup>. The EU experts believe that this system makes it possible to objectively evaluate the level of the scientific and technological development of the EU countries as

<sup>10</sup> Innovation and Technology Transfer, Special Edition, 2002.



well as the status and development of the economy of learning in these countries.

The design of the system was preceded by a lengthy debate and control calculation of a number of indices that could be included in the final list. In the end, it was agreed to have four groups of indices reflecting the following:

1. status of personnel potential;
2. funding R&D and patenting;
3. innovation activity, primarily in the group of small and medium-size enterprises;
4. modern technology transfer in the economy.

These are the basic indices. For deeper analysis other indices can be added, but they are not required for comparisons by the European Commission. The European Union intends to continue improving all four groups of indices.

Apart from designing innovation activity standards, different organizations try to construct comprehensive competitiveness indices that take into consideration a lot of factors. The best-known study was made by the World Economic Forum (held annually at Davos), which identifies the level of competitiveness and economic growth in individual countries. In 1996 the study covered 49 countries, while in 2005 there were already 95 evaluated by the following factors: openness, government, finance, technologies, infrastructure, management, labor, institutions. A general competitiveness index and micro competitiveness index are used to evaluate and forecast technological development. The competitiveness index reflects the effect of three groups of characteristics: technologies, institutions, and macroeconomic environment. Accordingly, the micro competitiveness index consists of two sub indices: development of national companies and quality of national business environment.

In particular, technological competitiveness is characterized by labor productivity growth, efficient resource utilization, substantial share of scientific-technological products in world trade, and high living standards.

To the sources of domestic technological development experts include such factors as expenditures for R&D; state and private expenditures for R&D; accessibility of venture capital; level of higher and mathematical education; availability of high-class scientists and engineers; presence of world-class research institutes; ties of universities and research institutes with industry.

In 2005 the leader among the countries selected for the rating was Finland, which in the year before ranked fifth (see Table 1). The US was second by the

competitiveness index and by the micro competitiveness index<sup>11</sup>. Almost half of the 500 largest industrial companies of the world (by the Financial Times FT-500 rating) were from the US and one from Finland. Notably, some countries have advantages by the micro competitiveness index, while others by the competitiveness index, e.g. Singapore 10th and 4th place respectively; China — 29th and 39th. Relying on the date of this study, we can identify the strong and weak points of countries. For instance, the technological component of Singapore's competitiveness is ranked as 18th in the world, while its macroeconomic environment holds first place, and fourth place as regards competitiveness. The US, by the technology index, holds first place in the world, and Finland third place.

Table 1

**Comparing Ukraine with some countries by the competitiveness index  
and micro competitiveness index in 2004—2005**

Indices	Ukraine	Russia	Estonia	China	Korea	Singapore	USA	Finland
Competitiveness index								
2004	56	54	—	40	28	2	1	5
2005	69	63	29	39	23	4	2	1
including:								
- technological index	63	60	8	53	9	18	1	3
- institutional index	71	61	29	50	44	6	12	1
- macroeconomic environment index	73	57	43	6	8	1	7	10
Micro competitiveness index								
2004	56	52	—	26	27	9	2	1
2005	60	58	27	29	28	10	2	1
including:								
- index of development of national companies and strategies	62	54	32	30	26	15	1	2
- index of quality of national business environment	60	56	26	28	30	9	2	1

<sup>11</sup> *Stratehichny menedzhment konkurentospromozhnosti nastionalnoi ekonomiky v perpektyvi yevrointehratsii.* [A.Pabat, S.Khaminich. Strategic Management of the Competitiveness of a National Economy in the Perspective of Eurointegration. *Economist* 12, 2005, pp.59-61].

When examining the principal factors impacting on innovation attractiveness (see Table 2), it becomes evident in what area a country enjoys competitive advantages. Luxembourg created the best conditions for the protection of intellectual property. The US has mighty venture capital and favorable conditions for scientific work. In 2004 the expenditures for R&D as share in GDP were the largest in Sweden, ahead of Japan that had been a leader in this respect for many years.

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<sup>12</sup> *Stratehichny me-nedzhment konkurentospromozhnosti nastionalnoi ekonomiky v perspektyvi yevrointehratsii.* [A.Pabat. S.Khaminich. Strategic Management of the Competitiveness of a National Economy in the Perspective of Eurointegration. *Economist* 12, 2005, pp.59-61].

Table 2

Indicators of countries' innovation attractiveness

Indices	Place in rating								
	1	2	3	4	5	56	57	58	59
Intellectual property protection	Luxembourg	USA	UK	Austria	Finland	Russia	Vietnam	Venezuela	Ukraine
Brain drain	USA	Japan	Finland	Germany	Spain	Zimbabwe	Venezuela	South Africa	Bulgaria
Accessibility of loans	Luxembourg	USA	Finland	UK	Belgium	Peru	Bulgaria	Ukraine	Ecuador
Venture capital	USA	Israel	Finland	UK	Netherlands	Peru	Salvador	Bolivia	Ecuador
Expenditures for R&D as share in GDP	Sweden	South Korea	Japan	Finland	USA	Ecuador	Columbia	Luxembourg	Zimbabwe

We can conclude that for all the different methods of evaluating the innovation potential of one or another country, economists are of one mind about the impact of their components and dynamics of economic development. World practice has convincingly proved that innovations impact directly proportional on the competitiveness of a national economy and its position in world economy.

Ukraine's Eurointegration intentions seriously raise the issue of revealing the possibilities of economic cooperation by involving the country's innovation potential in the Eurointegrative processes. But for this purpose innovation cooperation requires the harmonization and interaction of national economic systems.

Most modern researchers understand the essence of the term *national innovation system* in the interpretations of C.Freeman<sup>13</sup>, B.Lundwall<sup>14</sup> and R.Nelson<sup>15</sup>. The national innovation systems (NIS) of the European countries differ markedly within the context of set aims and purposes: while France sees as the main aim of NIS the creation of additional jobs, Germany as a development of progressive technologies. According to European experts, the effectiveness of NIS of these countries is approximately the same<sup>16</sup>. Differences also exist between the EU countries of the «second wave» of the integrative process and those countries that currently try to integrate into the European R&D environment. They are linked with a definite strategy of NIS development, macroeconomic policy, legislative framework, and financial-economic instruments of support. These differences are also reflected to a certain extent in the NIS structure of different countries and in the economic behavior of the principal entities of transnational innovation activity — the TNCs.

Within the EU the activity of the TNCs has certain features, primarily as regards a few of those companies that are among the leading corporations of the world. According to UNCTAD data, in the late 1990s there were almost 60,000 multinational firms that ran over 500,000 affiliates in different countries. More than a half of the TNCs were in Germany (7,100), followed by Japan (3,650), Sweden (3,550), Switzerland (3,000), the US (3,000), and the United Kingdom (2,800). At the turn of the millennium the foreign affiliates of TNCs manufactured US \$5 trillion worth of products, while 500 of the largest TNCs had concentrated over one-fourth of the world's output of goods and services, one-third of the export of industrial products, and three-fourth of

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<sup>13</sup> Freeman C. *The Economic of Hope Essays in Technical Change. Economic Growth and the Environment*. London; New York: Pinter, 1992

<sup>14</sup> Lundwall B.-A. *National Systems of Innovation: Towards a Theory of Innovation and Interactive Learning*. London: Pinter Publishers, 1992.

<sup>15</sup> Nelson R. *National Innovation Systems. A Comparative Publishers*, 1992.

<sup>16</sup> *Institutsionalnye aspekty razvitiya i vzaimodeystviya natsional-nykh sistem stran Yevropeiskogo Soyuzu*. [A.Oreshnikov. Institutional Aspects of Development and In-teraction of National Systems of the European Union Countries].

trade in technologies and management services<sup>17</sup>. Although sizeable in number, the European TNCs are not the most powerful on the world market. According to Global 500 (rating of the world's leading corporations), the 2005 rating included only 143 companies representing the EU. In this rating there is not a single country that acceded to the EU in 2004. The largest number of companies is in the United Kingdom (36), then in France — 28, Germany — 10, Italy — 12, the Netherlands — 12, Spain — 8, Sweden — 7, Belgium — 6, only 3 companies each in Denmark and Ireland, 2 in Finland, and 1 company each in Austria and Portugal<sup>18</sup>.

The European corporations have the strongest positions in the following sectors:

- 2 companies in the aerospace and defense sectors, their market value being only 2 % of the total market value of all Global 500 companies;
- 4 companies in the chemical industry (0.5 %);
- 4 companies in the IT sector;
- 5 companies in electronic machine-building and electric equipment (0.66 %);
- 6 companies in the automotive sector (0.8 %);
- 6 companies in electricity (0.84 %);
- 8 companies in the oil and gas industry (4.2 %)<sup>19</sup>.

Another distinctive feature of the innovation activity in the EU is the adaptational changes the new EU members are introducing into industry. According to Ukrainian scientists, the technological balance of payments for the new EU countries (when in 2001 they made the decision to accede) depends very much on the technologies from abroad<sup>19</sup>. For Hungary, Poland and Slovakia the payments in the referred to balance exceed earnings by 0.60 %, 0.43 % and 0.17 % of GDP respectively, and only the Czech Republic had a favorable balance of 0.14 % GDP. But in material production, Slovakia, Hungary, the Czech Republic and Poland had a much larger share of added value than the OECD countries as a whole and in 2003 accounted for 32.4 %, 31.1 %, 30.5 % and 28.9 % respectively of the OECD average<sup>20</sup>.

Yet another distinction of cooperation between Ukraine and the EU countries is the considerable increase in FDI committed to Ukraine and a small increase of FDI from Ukraine to the EU countries during the past two years (see figures 2 and 3).

<sup>17</sup> UNCTAD (1998a). *The Least Developed Countries 1998*. Geneva: UN Conference on Trade and Development UNCTAD (1998 b) *Trade and Development Report 1998*. Geneva.

<sup>18</sup> <http://www.fortune.com/fortune/global500>.

<sup>19</sup> *Transformatsiyni zminy v promysloviy strukturi Yevropeiskoho Soyuzu*. [V.Chuzhykov, D.Ilnytsky, O.Fedirko. Transformational Changes in the Industrial Structure of the European Union. *Economy of Ukraine*, No.6, 2006, pp.85-93].

<sup>20</sup> <http://213.253.134.29/oecd/pdfs/browseit/0105061E.PDF>

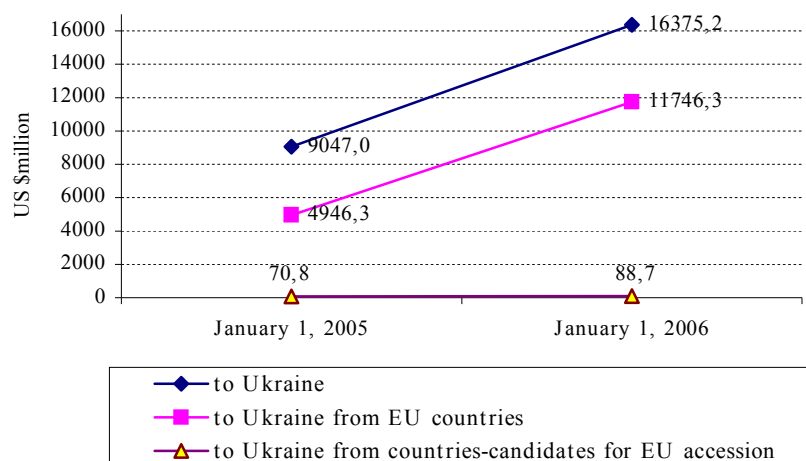


Fig. 2. Foreign direct investment to Ukraine from the EU countries

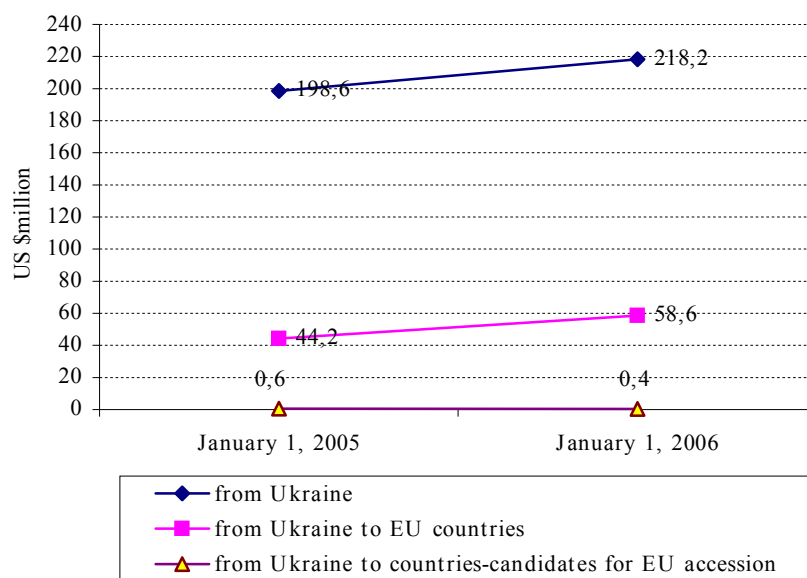


Fig. 3. Foreign direct investment from Ukraine to the EU countries

But judging from the data of distribution of FDI from the EU countries, FDI for innovation activity almost does not reach Ukraine<sup>21</sup>.

To invigorate Ukraine's innovation activity with the EU, it is necessary to substantially increase financing and for the government to take part in more extensive and diversified areas of innovation development. As statistics show, technologically developed EU countries, the US, and Japan uninterruptedly increase funding of R&D. Therefore, the forecast budgetary appropriations and funding of R&D in Ukraine are utterly inadequate (see Table 3).

Table 3

**Forecast of budgetary appropriations and funding of R&D in Ukraine<sup>22</sup>**

	2007	2008	2009	2010	2011
State budget expenditures ( % GDP)	1.20	1.40	1.55	1.70	1.70
Domestic orders ( % GDP)	0.72	0.79	0.86	0.93	1.00
Foreign orders ( % GDP)	0.67	0.69	0.71	0.73	0.75
Total expenditures for R&D ( % GDP)	2.59	2.88	3.12	3.36	3,50

Given Ukrainian realities, it can be argued that the potential for the development of international industrial and scientific-technological cooperation should be concentrated in a rather narrow number of areas of such cooperation. Experts believe that the main objective of deepening cooperation is for Ukraine joining the integration high-tech efforts of EUREKA and such international EU programs as ESPRIT, BRITE, BAP and others that deal with fundamental scientific and technological issues to achieve a qualitatively new manufacturing and research potential as well as a joint effect from participation in the establishment and work of international research centers.

The scientific-technological program EUREKA was initiated by France and endorsed in 1985 by the 1st Conference of Ministers of the countries participating in this program. It is an information network covering all of Europe and aims to conduct R&D that would be competitive on the world market. All of its areas almost completely accord with the priorities of Ukraine's innovation activity, namely: IT, communications, power engineering, medicine, biotechnologies; transport, new materials, robotics, industrial automation, lasers, environment. The EUREKA program ensures the implementation of projects

<sup>21</sup> *Spiyrobotnytstvo mizh Ukrainoiu ta krainamy ES. Statystychny zbirnyk*. [Cooperation between Ukraine and the EU Countries. Statistical Reference Book. published by the State Statistics Committee of Ukraine. Kyiv, 2006, pp.324].

<sup>22</sup> *Nauka ta innovatsiyny protses v Ukraini. Problemy Nauky*. [P.Bubenko, K.Priadkin. Science and the Innovation Process in Ukraine. *Issues of Science*, No,4, 2003, pp.8-12].



when the efforts of one country to this end are not enough for one or another reason.

The advantages of a country's participation in this program consist in that additional resources (special know-how, auxiliary technologies, manufacturing facilities, sales/marketing networks, etc.) can be attracted to complete a project. The status of EUREKA confirms its high-tech prestige, international level of quality and opportunities that contribute to the future success on the market.

For Ukrainian innovation products such support is also important, because it complements to a certain extent the existing legal framework in case of detection of flaws or the lack of necessary international industrial standards that stand in the way of commercializing new technologies or create technical obstacles in trade.

To lend international cooperation a mutually beneficial nature, it is advisable to establish in our country clusters patterned on the Silicon Valley, which are successfully used in the majority of developed countries, the EU included. This is a new vector of institutionalizing the scientific-technological environment. Its underlying foundation has three mutually related components: foreign investment growth, more vigorous transnational manufacturing and multinational cooperation, and the establishment of international manufacturing networks. In our opinion, the establishment of such networks on the basis of clusters would be a catalyst of profound structural changes in the economy and facilitate its stable growth.

But what should also be taken into account is that for Ukraine's national innovation system the effect from local innovation centers (technoparks, technopolises and the like) or the stimulation of exclusive highly productive and export-oriented commodities would be much lower than in the technologically developed countries, primarily in the EU countries. This can be explained by the relatively technological homogeneity of these countries' enterprises and their high attractiveness for innovations. The products of high-tech sectors easily find their place in the economy, the latter being to a considerable extent facilitated by the motivation for using innovations and stimulating demand in innovations.

A realistic condition for bridging the technological gap between Ukraine and the EU is the speeded-up establishment of new institutions whose purpose would be to ensure the postindustrial development of the economy and its reorientation toward an innovation model.

Advancing integration policy in R&D and the commercialization of technological developments to the level of state priorities requires inter-state regulation between the EU member countries as well as between the EU and other countries, Ukraine in particular. In this case Ukraine's Europeintegration strategy implies the regulation of international capital flows, the activity of the market institutions of intellectual property, as well as the financial resources of the state and economic entities.

## Conclusions

In order to pursue its Eurointegration intentions more energetically, Ukraine has to identify the possibilities of including the innovation component in this process. In international economic relations, scientific-technological and innovation cooperation ensures mutual benefits. Relying on the experience of the developed countries, we have revealed the financial and institutional limitations that stand in the way of deepening Ukraine's innovation interaction with the EU. To achieve the desired purpose, as system of priorities of the country's innovation development should be set, namely to:

- restructure Ukraine's economy on the basis of technological renovation in accordance with its internal requirements and the requirements of development of partner countries, primarily in the EU, to enhance the competitiveness of the domestic economy and find its own technological niche in the system of international economic relations;
- speed up international lending and investing in both joint innovation projects and those executed by national project developers for account of foreign financial institutions and also for account of combined sources of financing.

The integration of Ukraine's technological priorities into the world scientific-technological space and the harmonization of institutional regulators, their structure, substance and instruments of technological cooperation — legal, IT, organizational, managerial — and the evolution of Ukraine's state technological and innovation policy will facilitate the choice of international cooperation on a bilateral and multilateral basis. Ukraine's interaction with the countries whose economies are built on knowledge and the design of mechanisms of their joint use of technologies and innovations will deepen cooperation by participation in special partnership programs and more extensive introduction of the latest in technologies at the enterprises involved in innovation activity.

As a general conclusion, it should be pointed out that the growth of Ukraine's innovation potential is an imperative condition for the implementation of a consistent policy of Eurointegration. The objective stimulus of deepening the integration processes between the countries of Central Europe and Ukraine requires adequate institutional reforms. There is an urgent need to assimilate the model of innovation development, introduce on its basis industrial systems of manufacturing, overcome the deep differentiation in the population's incomes, and ensure advancing economic growth rates.

When determining the system of formation and orientation of the innovative potential of Eurointegration, it should be borne in mind that direct adoption of world experience might achieve little results. The objective reasons behind such an outcome could be the different motives in the behavior of the entities of economic relations as well as the signals and mechanisms of administration in the different economic systems. There are also essential dif-

ferences in the government's participation in the innovation process, its economic results and social implications. These circumstances should be taken into consideration when framing innovation policy and adapting it to the requirements of the EU. There is also the need to clarify the interests of the EU in relation to our country in the area of innovations and how they accord with national interests, and then design the strategy of innovation-technological cooperation as a component of Ukraine's accession to the EU. When framing innovation policy, considerable attention should be attached to the mechanisms of clearing the current obstacles and the ones that might appear in the future.

To the institutional conditions of bringing into accord the national interests of the participants in the Eurointegration process concerning innovation, the following should be referred: alignment of Ukraine's legislation with EU legislation; precise determination of functions, powers and obligations of government agencies; all-round support of elements of an effectual innovation system and elaboration of actions to promote its entry into the EU markets. Synchronization of the pace and quality of economic growth should be the priority condition of speeding up the Eurointegration process in the area of scientific, technological and innovation activity.

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The article was received by the editorial board on 21.03.2007