

Regional Innovations in Transition Economies (the Case of Ukraine)

Market transformation of post-socialist countries was accompanied by innovative activity slowdown against the background of considerable economic recession and further crisis. The former economic system was characterized by selective approach to the innovations. Particularly, in the former Soviet Union, including Ukraine, demand on the innovations within military-industrial complex prevailed. Institutional and structural transformations, conversion of military-industrial complex, prolonged rehabilitation period had negative influence on the development of innovative sphere of Ukraine. At industrial enterprises introduction of new types of production decreased more than 3,6 times in 2005 in comparison with 1995, amount of innovatively – active enterprises – more than 2 times, and adoption of new technological processes – more than 1,6 times¹. Among factors, preventing the innovative activity of industrial enterprises at the present time, first of all, we should mention the following: economic factor (lack of own funds), excess expenditures on innovations, insufficient financial support of the state, high economic risks, imperfection of legislative basis, prolonged period of innovations' recoupment, insufficient amounts of customers' money etc.

In addition, we could mention such factors as absence of opportunities for cooperation with other enterprises and scientific organizations, underdevelopment of informative base about new technologies and product markets, lack of high-qualified personnel, low susceptibility of companies and enterprises to innovations, absence of proper demand on innovative production. As a result, specific weight of sold innovative production in total volume of sold production amounted just 6,5%

¹ Calculated by: Hurzhiy A. M. and others. Innovative activity in Ukraine. Kyiv. 2006, p.9-10.(ukr.)

in 2005, and technological component kept just 0,7% of GDP growth². According to existing calculations, specific weight of innovative production in its total volume must increase up to 35 % in Ukraine till 2015³.

Innovative policy is characterized by 3 main levels: national, regional and local. Their systemic, coordinated interaction has determinative influence on the economic growth under conditions of emerging economy of knowledge. As this analysis focuses on regional aspects of innovative development, we will review the main characteristics of Ukrainian regions, which have considerably different economic, natural and scientific, and technical potentials, socio-economic levels.

Table 1

Main characteristics of the regions of Ukraine

Region	Territory, thousand km ²	Population (as of 01.01.06), thousand people	Gross regional product, million UAH	Per capita income, UAH	Fixed assets, million UAH	Sum of sold industrial production, million UAH
Autonomous Republic of Crimea	26,1	1983,8	12848	5432,9	47685	7398,4
Vinnitsya	26,5	1701,6	10207	5791,1	28747	7154,2
Volyn	20,1	1040,4	6553	5254,2	16559	5378,0
Dnipropetrovsk	31,9	3447,2	41227	7015,9	136776	69034,2
Donetsk	26,5	4622,9	58044	7088,9	144630	98396,1
Zhytomyr	29,8	1330,1	7430	5568,5	21669	5129,7
Zakarpattia	12,8	1245,4	6700	4821,2	17027	3200,3
Zaporizhzhya	27,2	1861,0	19962	7074,5	70358	34270,6
Ivano-Frankivsk	13,9	1388,9	9622	5321,6	28022	7335,2
Kyiv region	28,1	1763,8	15362	6305,0	46815	14521,0
Kirovohrad	24,6	1067,2	6877	5568,7	21612	3484,9
Luhansk	26,7	2409,1	19716	5900,9	57357	34687,3
Lviv	21,8	2577,1	17192	6203,1	59232	11759,3
Mykolaiv	24,6	1219,6	9553	6137,5	29348	9130,2

² Shevtsova H. Z., Memedlyayev Z. N. Theory and practice of innovative activity. Luhansk, 2007, p.30 (ukr.).

³ Innovations: problems of science and practice. Kharkiv, 2007, p. 61 (ukr.).

Odesa	33,3	2402,2	20762	5883,4	65200	14624,5
Poltava	28,8	1554,9	18099	6653,5	57632	23100,3
Rivne	20,1	1156,5	7263	5344,4	22785	5148,8
Sumy	23,8	1226,3	8025	5972,0	28138	7715,3
Ternopil	13,8	1112,1	5137	5032,7	15097	2488,6
Kharkiv	31,4	2829,0	25618	6355,7	86816	22685,3
Kherson	28,5	1126,5	6469	5400,5	19234	3758,1
Khmelnysky	20,6	1373,4	7958	5733,3	26764	5127,5
Cherkasy	20,9	1341,5	9014	5534,0	26790	7493,4
Chernivtsi	8,1	908,2	4234	5078,0	13720	1466,7
Chernihiv	31,9	1168,5	7627	5979,1	29425	6107,5
Kyiv city	0,8	2693,2	77124	10683,3	151036	56735,8
Sevastopol city	0,9	379,1	2823	5723,3	7627	1411,1

Source: Ukraine in figures 2006. Statistic Handbook. Kyiv, 2007, p.46(ukr.);
Statistic Collection "Regions of Ukraine" 2006. Part 1, Kyiv, 2006, pp. 11-12 (ukr.).

Taking into account quantitative and qualitative parameters (economic, scientific and technical, natural and resource potential, level of socio-economic development) of Ukrainian regions, they may be divided into 3 main groups:

- regions of major industrial agglomerations with high level of product (production) and population concentration (Donetsk, Dnipropetrovsk, Zaporizhzhya, Luhansk regions);
- industrially developed regions with product concentration mainly in regional centres and big cities (Kyiv region and Kyiv city, Kharkiv, Odesa, Lviv, Poltava);
- regions with local industry (the Crimea and many western regions).

As is known, innovations become apparent in different forms, such as: new kinds of technology, new production, new production process. Usually, term "innovations" means system, which consists of 3 specific phases: knowledge generation; common usage and dissemination of knowledge among potential consumers; usage of this knowledge for product development*. Obviously, all elements of this cycle are integrally determined by the level of economy

* Schumpeterian vision of innovations includes some additional elements (new markets, competition, management improvement etc.). Ukrainian statistics rates fundamental and applied researches, scientific and technical developments and scientific and technical services as scientific and scientific-technical works. In addition, technological innovations, technologically new products, innovative production are singled out (Regions of Ukraine, 2006. Part II. Kyiv, 2006, p.363).(ukr.)

development of the region, by the character of institutional structures and the size of financial potential.

Thus, innovative development of the regions greatly depends on 3 main groups of factors, namely economic, institutional and financial. During the last decades economic component in Ukraine can be generally estimated as favourable, as a result of steady economic growth, with average annual rate of 7,4% in 2000-2007. At the same time regional measurement of economic growth is not so definite in terms of its quality, dynamics and structure of production.

Market transformation, privatization of state-operated enterprises, liberalization of economy and improvement of investment climate are the main incentives for innovations at the regional level. However, the great share of shadow sector (about 50%), archaic structure of economic system, low technological level of released production, as a whole extensive (cost-based) type of economy complicate innovative process. Therefore, for example, labour productivity in metallurgy industry in Ukraine doesn't exceed 29% of the level of EU, 28% - of the level of Germany, 27,6% - of Japan, 36,9% - of Brazil.

Institutional structures at the regional level are on the stage of formation in Ukraine. On the one hand, after collapse of the Soviet Union regional authorities have received additional powers and economic opportunities in the context of innovative development. On the other hand, during the formation of regional authorities and self-government there was an evident disbalance of authorities, contradictions between them have become aggravated.

Apart from general institutional factors of insufficient innovative activity of the regions, it is necessary to emphasize weakness of regional government owing to duplication of local authorities' and self-government institutions' functions, usage by both parties of out-of-date management, absence of real economic, financial and institutional leverages and stimulus of influence on innovative process. The second institutional problem is imperfection of the legislation on protection of the intellectual property rights. Besides, venture business, cluster innovative systems and pilot projects are at the initial stages of their development.

Large local enterprises and corporations remain practically the only structures which generate innovations (see table 2).

Table 2

Main business groups in Ukraine

	Name	Assets, million \$	Key business interests
1.	<i>System Capital Management</i>	12,144	Ferrous metallurgy, iron ore, coal, coke, electrical power engineering, engineering industry, finances, telecommunications, hotels, beer, non-alcoholic beverages, etc.
2.	<i>Industrial Union of Donbas</i>	7,391	Ferrous metallurgy, iron ore, coal, coke, electrical power engineering, engineering industry, agricultural business, tourism, etc.
3.	<i>Privat Group</i>	6,312	Finances, oil business, ferrous metallurgy, iron and manganese ore, ferroalloys
4.	<i>Interpipe</i>	5,410	Pipe manufacturing, ferrous metallurgy, ferroalloys
5.	<i>Mariupol metallurgical works (Illich plant)</i>	5,102	Ferrous metallurgy, coke, iron ore
6.	<i>Donetskstal</i>	4,272	Ferrous metallurgy
7.	<i>Zaporozhstal</i>	2,763	Ferrous metallurgy, financial market
8.	<i>APC-group</i>	1,931	Coal, coke, engineering industry
9.	<i>Ukrauto</i>	1,594	Motor industry, financial market
10.	<i>Continium</i>	1,491	Oil industry, confectionary and dairy industry
11.	<i>Energostandard</i>	1,429	Power engineering, engineering industry
12.	<i>Ukrprominvest</i>	1,129	Motor industry, shipbuilding, transportation
20.	<i>Ukrainian Innovative-financial company</i>	0,788	Electrical power engineering, hotels, gas complex

Source: Big Ukrainian capital: mutual relations with state authority and society. Kyiv, 2007, p.14.(ukr.)

As the analysis indicates, large economic entities are not only the main manufacturers of innovations, but they also form a financial base of regional innovative process. But certain, even large-scale innovations, frequently lead to greater differentiation of the regions, further marginalization of some of them, turn them into the regions with depressive status.

Regional projection of the economy of knowledge is carried out by determining scientific and technical potential of the region, including its innovative components (Table 3).

Table 3

Basic components of scientific and technical potential of the region

Component	Certain indicators
<i>Scientific manpower</i>	<p>X1 – number of staff in scientific organizations per 10 thousand employed population;</p> <p>X2 – specific weight of persons with scientific degrees in the region in general number of experts, taking part in scientific, research and development projects;</p> <p>X3 – number of scientists in the region, who had worked abroad under the contract, per 1 thousand experts</p>
<i>Financing</i>	<p>X4 – financing of scientific, scientific and technical works in the region (in % to gross added cost);</p> <p>X5 – financing of scientific and scientific and technical works in the region, per one employee (thousand UAH)</p>
<i>Capital investment yield</i>	<p>X6 – capital investment yield of labour of principal activity employees of scientific organizations per one employee (thousand UAH)</p>

<p><i>Innovation potential</i></p>	<p>X7 – number of applications for titles of protection, submitted to the State Patent of Ukraine, per 1000 persons of active population of the region;</p> <p>X8 – number of applications for titles of protection, submitted to patent bodies of other countries, per 1000 persons of active population of the region;</p> <p>X9 – number of patents, received in patent bodies of Ukraine and foreign countries, per 1000 persons of active population in the region</p>
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Source: Innovations: problems of science and practice. Kharkiv, 2007, p.62-63 (ukr.).

Limit of scientific, technical and innovative potential of the regions can fluctuate from 0 to 1. Low level is characterized by indicators 0 to 0.25, average - 0.25 - 0.50; high 0.50 – 1.00. Quoted characteristics and their different combinations are used mainly for analytical purposes. Official statistics operates with another set of figures and criteria, which reflect different static and dynamic aspects of development of innovative activity in the regions.

The following factors have a direct impact on innovative activity of Ukrainian regions: general costs on innovative activity; internal current costs on scientific, scientific and technical works; quantity of organizations, carrying out scientific, scientific and technical works; quantity of experts, occupied in scientific, scientific and technical sphere, including those with the highest level of skills; number of institutes of higher education of I – IV levels of accreditation. In regional perspective these factors can be presented as a table:

Key factors influencing volume of innovative production in the regions of Ukraine (data for 2005)

Region	Volume of innovative production (thousand UAH)	General amount of expenses on various directions of innovative activity (thousand UAH)	Internal current costs on scientific, scientific and technical work (thousand UAH)	Number of organizations carrying out scientific, scientific and technical works	Number of experts, occupied in scientific, scientific and technical works	Number of institutes of higher education of I – IV levels of accreditation
Crimea	932209,0	93613,8	89857,2	47	1946	35
Vinnyitsya	54026,4	55701,0	39391,3	28	866	25
Volyn	206823,0	9315,5	10985,9	16	482	18
Dnipropetrovsk	2650430,3	385472,6	364020,7	109	9021	57
Donetsk	4935545,3	1955088,2	250496,3	81	7633	90
Zhytomyr	147812,4	46797,1	10461,3	12	430	25
Zakarpattia	100270,1	6031,5	14688,1	21	661	19
Zaporizhzhja	3201468,0	158383,2	246521,8	38	3156	35
Ivano-Frankivsk	199995,0	56244,7	27307,6	21	764	31
Kyiv region	309261,3	30672,8	80933,7	36	2451	25
Kirovohrad	220297,9	36542,8	14427,6	11	429	23
Luhansk	1449660,2	334418,0	60891,7	49	1897	42
Lviv	343360,4	75858,0	156784,1	87	4847	61
Mykolaiv	719781,7	255470,6	157957,9	41	1457	17
Odesa	2176907,3	110684,1	106424,4	74	3459	45
Poltava	349933,3	138499,0	34182,9	32	954	26
Rivne	55143,0	32742,0	9331,7	17	332	17
Sumy	1243998,0	109303,9	83821,5	29	2429	17
Ternopil	44092,5	5678,8	11991,5	16	436	23
Kharkiv	1903187,6	592036,8	682762,6	227	17203	75
Kherson	128282,4	41451,4	17197,0	28	954	21
Khmelnitsky	189973,2	18071,6	4044,3	6	122	25
Cherkasy	103495,3	53903,8	27119,2	30	913	27
Chernivtsi	77841,0	13838,9	13840,2	24	684	20
Chernihiv	252979,7	122445,3	21194,7	22	683	26
Kyiv city	2986358,4	1009456,3	1794270,1	393	39969	116
Sevastopol city	12244,3	3841,2	55364,2	15	1334	10

Source: Statistic Collection "Regions of Ukraine" 2006. Part I, 2006 p.441; Part II, Kyiv, 2006 p. 364-368, 373, 377 (ukr.).

We can evaluate effectiveness of innovative activity of the regions by the correlation of results, namely received innovative production (the second column in the table) and costs of its carrying out (the third column in the table). Calculations indicate that the figures vary greatly in different regions; there can be more than 20 times difference between them. Indicators in relatively small regions (Vinnytsja, Volyn, Zakarpattya and Khmelnytsky regions) are characterized by the biggest fluctuations. Above the average returns can be seen in a number of large regions (the Crimea, Dnipropetrovsk, Zaporizhzhya, Odesa, Sumy regions). High indicators, correlated with the quantity of organizations, carrying out scientific, scientific and technical works, number of experts, occupied in scientific, scientific and technical sphere, and quantity of institutes of higher education display the Autonomous Republic of Crimea, Dnipropetrovsk, Zaporizzja, Kyiv, Lviv, Odesa regions.

An important role at the regional level belongs to appropriate innovative infrastructure, which assists in providing financial, information, consulting, marketing and other kinds of support to innovative processes. It includes, as a rule, universities and other educational institutions, enterprises, research centres, regional governance bodies, financial institutions, all that enables to create interconnected set of relations in the system: education – scientific researches and development – industrial production – market. Ukrainian legislation provides for creation of the whole network of innovative structures: industrial parks, technology towns, innovative business-incubators, innovative exchanges, consulting, engineering, marketing firms, technological clusters and other institutions. The most widespread in Ukraine are industrial parks, which produce about 20% of innovative production in the country. Such institutions as Electric Welding Institute named after E.Paton, Monocrystal Institute, Kyiv Polytechnic University have successfully been integrated into the economy of knowledge. But creation of the system of innovative institutions in the regions is restrained both by the above-mentioned reasons of macroeconomic nature and the factors of regional level. One

of the main reasons is deficit of financial resources. In accordance with Ukrainian law “On scientific, scientific and technical activity” allocations on science should amount to 1.7% of GDP. In fact, during 1992 – 2005, that average annual indicator was only 0.42% of GDP. In 2005 only Kyiv, Lviv, Mykolaiv, Chernivtsi regions and Kyiv city allocated funds for innovative activity from their local budgets. The main sources of financing innovations are enterprises own funds, which amount to almost 80%. Credit resources play unimportant role (less than 20%). Recent events connected with the world mortgage crisis, forced the National Bank of Ukraine to pursue a rigid monetary policy, and to increase its rate of interest to 12% per year, which is 2, 5 times higher than optimal indicators, leads to rise in the cost of credit and restricts this source of financing innovations.

Thus, as the above-mentioned data indicate, the majority of regions have no their own funds for financing innovations. Solution of this problem lies in radical reforms of interbudget relations on the basis of fiscal decentralization, providing more independence to regional self-governance. Such a reform is to be directed at increase of regional budget revenues through redistribution of financial resources, strengthening of fiscal authorities of regional governance. Decentralization will give more responsibility to regional authorities, lead to more efficient use of innovative development resources.

Attraction of foreign financial sources is one of the important ways of increasing financial resources for regional innovations. Such financial instruments as grants, loans, share capital and indirect support constitute the basic elements of regional financial value chain (the analogue of global value chain). Every regional innovative project or company, implementing it, requires special, specific solution, which depends on individual increasing demands and appropriate innovation stage. The main thing in the process of providing financial resources for innovation development, both for public and private sectors, is to direct one’s activity in such a way as to provide interconnected and efficient interaction between various elements of this chain.

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