

COMPETITIVENESS, INNOVATIVENESS AND INNOVATION ACTIVITY OF THE UKRAINIAN ECONOMY: PERFORMANCE AND MEASURES FOR ENHANCEMENT¹

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Abstract: *The competitiveness of Ukraine is analyzed by comparison with relevant indicators for Poland. Competitiveness rank of selected Ukrainian regions is analyzed on the basis of their monitoring by the WEF methodologies and comprehensive evaluation of the innovation activity in Ukrainian regions. Measures to enhance the competitiveness, the innovativeness and the innovation activity of Ukraine are discussed.*

Keywords: *competitiveness, innovativeness, innovation activity, innovation, socio-economic development, restructuring of the economy.*

INTRODUCTION

Market transition in Ukraine still has weak effects on the solutions related with socio-economic development and raising life quality standards. This can be clearly seen from cross country comparisons. In the long-term retrospective, the Ukrainian GDP fell in 1990-2008 by 20%, whereas in Poland it grew nearly twice. The position of Ukraine was weakened even more by the global economic crisis. According to the World Bank, per capita GDP (by PPC) in Ukraine amounted 7270 international dollars in 2008 and exceeded the analogous measure for China (6280 dollars), whereas in 2009 it fell in Ukraine to as low as 6180 dollars, against 6890 dollars in China. The above gap becomes even wider when measured by the Gross National Income (GNI): 2800 dollars in Ukraine against 3650 dollars in China.

The above figures are indications of drawbacks in elaborating and implementing the mechanisms for enhancing the competitiveness, the innovativeness and the innovation activity of the Ukrainian economy, although they are supposedly the basis of the effective economic growth. In view of this, analyses of levels and changes of the indicators reflecting economic competitiveness and innovation activity at macro and micro level, search for factors pushing them up and making cross country comparisons become increasingly important for Ukraine and for other transitional economies.

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The article contains a review of definitions pertaining to the competitiveness and the innovativeness of an economy; results of the comparative analysis of Global Competitiveness Index (GCI) estimates derived for Ukraine and Poland in 2007-2011 by the World Economic Forum (WEF) methodology; results of the analysis of competitiveness indices for Ukrainian regions, derived by the WEF methodology and supplemented by results of the comprehensive evaluation of the innovation activity in Ukrainian regions; description of measures to enhance the Ukrainian global competitiveness ranks; conclusions.

DEFINITIONS

The notion of the competitiveness of a national economy has no standard definition, most often being associated with the notion of the competitiveness of a country, defined differently by various authors. According to M. Porter, the competitiveness of a country is the position of national commodity producers at domestic and foreign markets, determined by a set of factors and reflected by a system of indicators [1]. In the definition used by OECD, the competitiveness of a country is the capabilities of this country to produce commodities and services in the conditions of free and fair market, which meet international market requirements, and to secure and increase real incomes of domestic population over a long period of time [2].

According to the WEF methodology (1997), competitiveness of a national economy is defined as the ability to secure stable and high rates of growth in the real per capita income that is measured by rates of growth in the gross domestic product per capita in constant prices. Now the competitiveness is treated by the WEF as a set of institutes, legal rules and factors that determine the level of labor productivity in a country [3]. As follows from the latter definition, labor productivity growth represents a core indicator of the economic efficiency and economic growth.

Labor productivity growth is interpreted by the contemporary economic theory as reflects incorporation of science & technology in a national economy through utilization of science & technology products and innovation activity at macro, meso and micro level. According to experts' estimations, the overall labor productivity in Ukraine has been far lower than the one across the EU, and featured very uneven increase over the recent years [4], which evidences on poor attention to issues of its systematic growth. Labor productivity growth enhances the competitiveness of economies and their capabilities to increase the incomes of domestic population.

Articles of Ukrainian researchers contain definitions of the national competitiveness, emphasizing its key features such as the capability to guarantee supply of goods and services produced by use of advanced technologies, free and fair market and increasing income of the population [5]; utilization of the national competitive advantages on the innovative basis in parallel with implementing measures aimed at comprehensive and systemic consolidation of all the existing factors of the country's competitiveness [6]; the secured enhancement of the national production's efficiency and coming out with better socio-economic parameters, than the ones of competitors [7]; increasing life standards of the population along with keeping to the international ecological standards [8]. Evidence is also given of the innovation development effects for the competitiveness [9] and technological competitiveness of a country [10]. Because of the weak emphasis on the effective measures required for competitiveness enhancement and solutions of social problems in the context of transitional economies, the competitiveness is defined in [11] as "the capability of a country to secure stable and high rates of growth in the level of consumption and real per capita

income on the basis of institutional transformations that encourage structural shifts in the economy and steady grow in labor productivity”. Also, the competitiveness in Ukraine and its regions in the global perspective is subject of concern for WEF experts [12].

The term “innovativeness” is used to a broader extent in scientific literature. According to [13], the innovativeness denotes the ability of an individual or other entity introducing innovations to accept new ideas concerning other agents of the system, while the innovativeness degree and the agents’ distribution by introduction type is determined by the time spent till the moment when an innovation is introduced. In [14, 15] the innovativeness is defined as the capability of an organization for continual generation of innovations, whereas in [16] it’s defined as the capability of a firm to launch developments of new commodities and services, with creativity being a key resource.

The innovativeness at macro and regional level is treated by us as the capability, available with economic entities and the nation innovation system in the existing economic environment, to generate knowledge, produce competitive innovations and distribute them at national and global markets. A key criterion of the innovativeness of an economy is the efficiency and the scale of the innovation activity in a country (region), which is derived from innovation surveys by use of relevant indicators. It should be reminded that, according to the definition in [17], innovation activities pertain not only to “all the research, technological, organizational, financial and commercial actions that lead to realization of innovation or conceived for this purpose”, but also “research and development, not linked directly to the development of a concrete innovation”. Factors of the innovativeness of an economy are stocks of human capital, intellectual capital, national innovation capabilities, and the intensity of knowledge transfer from the R&D sphere to the production. Basically, the innovativeness of an economy depends on the innovativeness of economic activities, scientific and science & technology activities [18], institutional and practical links between them with respect to generation and utilization of new knowledge.

GLOBAL COMPETITIVENESS OF THE UKRAINIAN ECONOMY

The WEF publishes annual Global Competitiveness Reports, where the included countries are ranked by their competitiveness in the world economy. To measure the global competitiveness, the so called index method is used, when the weighted multi-criterion Global Competitiveness Index (GCI) is derived for cross country comparisons. GCI is calculated by aggregating indicators measuring various aspects of the national competitiveness at micro and macro level. The measured indicators are grouped into the three sub-indices (structural indicators), “Basic requirements”, “Efficiency enhancers” and “Innovation and sophistication factors”, with the total of 12 components (the so called pillars of competitiveness). “Basic requirements” are measured by the four components (pillars): Institutions, Infrastructure, Macroeconomic environment, Health and primary education; “Efficiency enhancers” – by six components (pillars): Higher education and training, Goods market efficiency, Labor market efficiency, Financial market development, Technological readiness, Market size. “Innovation and sophistication factors” – by the two components (pillars): Business sophistication, Innovation.

We are going to make a brief comparative analysis of the global competitiveness of Ukraine by the GCI data for 2007-2008, 2008-2009, 2009-2010, 2010-2011, which show competitiveness estimates for Ukraine in 2007, 2008, 2008 and 2009, respectively. The competitiveness estimates featured strong reduction in this period. According to GCI for 2007-2008, Ukraine ranked 73 (3.98 scores) in the list of 131 countries, whereas in 2008-

2009 it ranked 72 (4.09 scores) in the list of 134 countries. However, in 2008 Ukraine's rank moved down to 82 (3.95 scores) in the list of 133 countries, and in 2009 it moved even lower, to 89 (3.90 scores) in the list of 139 countries. In fact, apart from developed countries where the competitiveness is much higher than in Ukraine, Ukraine was far beneath the new EU member states, such as Poland that could up-grade the competitiveness in 2009, ranking 39 (4.51 scores) against 2008 (46), or Hungary, ranking 52 (4.33 scores) in 2009 against 52 in 2008.

Basically, indicators of the Ukraine's competitiveness correlate with the dynamics of the economic indicators. A stabilization of the Ukraine's competitiveness in 2006-2007 reflects high rates of GDP growth in this period, originating mainly from growth in prices for the Ukrainian exports in parallel with accelerated rates of growth in the international economy and improvements in the national managerial practices. It should be reminded, however, that the real GDP in Ukraine in 2007 and 2008 amounted to only 72.2% and 74.1% of the year 1990. Ukraine couldn't encounter the severe financial and economic crisis of 2008-2009, which considerably slowed the rate of economic growth across the EU and the world, and led to the increasing unemployment and social tensions. While GDP growth in Ukraine was 7.3% in 2008, in 2009 it fell to -15.1%. As a result, the real GDP in Ukraine in 2009 amounted to only 63.1% of the year 1990, and only slightly exceeded the level recorded in 2005 (62.1%). Heavy shrinkage of the Ukrainian economy in 2009 was the expected outcome of disregard to the quality of economic growth in the pre-crisis period.

Basically, estimates of the Ukrainian economy are more than twice lower than in the neighboring Poland where the population is nearly 7 million less. While GDP (by PPC) in Ukraine in 2009 and 2010 amounted to 289.3 and 306.3 billion U.S. dollars, in Poland it was 688.3 and 721.7 billion U.S. dollars.

A brief analysis of changes in GCI indicators for Ukraine in 2006-2009, and their comparison with analogous indicators for Poland in 2009, according to the WEG reports, is given in Table 1.

A comparison of the three GCI sub-indices in 2006-2009 allows one to see that Ukraine has the lowest ranks (86 and 102) by the sub-index "Basic requirements", whereas its position by the other sub-indices is better: 58 and 72 by "Efficiency enhancers", 66 and 88 by "Innovation and sophistication factors". Of the two latter indicators, a more sustainable position is featured by Ukraine by the sub-index "Efficiency enhancers". However, Ukraine lags behind Poland by all the sub-indices, the widest gap (46 positions) being by the sub-index "Basic requirements". A more detailed comparative study is made by breaking GCI components (pillars) for each country into the four groups: most developed ones, developed ones, weakly developed ones and the weakest developed ones.

The most developed GCI components in Ukraine are the two indicators, "Higher education and training" (component 5) – 46 rank in 2009, and "Market size" (component 10) – 38 rank in 2009, although the rating of the latter fell by 12 positions in the analyzed period. The first indicator reflects the created stock of educated workforce that is capable for quick adaptation to environmental change and for regular up-grading of skills when operating the continually renovated production systems. In this rating, Ukraine could even improve the indicators in 2009 in relation to 2006 (53 rank), but had a considerable lag from Poland that ranked 26 in 2006. The second indicator accounts for the size of both internal and external market for Ukraine, because large markets allow companies to benefit from the economy of scale, and to have the productivity effects. In 2009, Poland ranked 21 by this indicator, leading Ukraine by 17 positions.

Table 1: Global competitiveness indicators for Ukraine and Poland, 2006-2009

Year and number of countries in GCI rating*	Score in GCI	Rank in GCI	Sub-index 1: Basic requirements	Sub-index 2: Efficiency enhancers	Sub-index 3: Innovation and sophistication factors	Institutions	Infrastructure	Macroeconomic environment	Health and primary Education	Higher education and training	Goods market efficiency	Labor market efficiency	Financial market development	Technological readiness	Market size	Business sophistication	Innovation
						Sub-index 1				Sub-index 2						Sub-in. 3	
						Number of GCI components											
						1	2	3	4	5	6	7	8	9	10	11	12
Ukraine																	
1	3,98	73	90	66	75	115	77	82	74	53	101	65	85	93	26	81	65
2	4,09	72	86	58	66	115	79	91	60	43	103	54	85	65	31	80	52
3	3,95	82	94	68	80	120	78	106	68	46	109	49	106	80	29	91	62
4	3,90	89	102	72	88	134	68	132	67	46	129	54	119	83	38	100	63
Poland																	
3	4,33	46	71	31	46	66	103	74	35	27	53	50	44	48	20	44	52
4	4,51	39	56	30	50	54	72	61	39	26	45	53	32	47	21	50	54

Source: compiled by the author on the basis of WEF reports

* 1. 2007-2008: 131 countries; 2. 2008-2009: 134 countries, 3. 2009-2010: 133 countries 4. 2010-2011: 139 countries.

The following four indicators can be regarded as developed GCI components for Ukraine, which, together with most developed ones, can lay the basis for enhancing the national competitiveness.

“Infrastructure” (component 2) – 68 rank in 2009 for Ukraine, which is much better than in 2006-2007, being an indication of the improving infrastructure. Indicators incorporated in this component reflect the performance of transport arteries that are supposed to reduce the effect of distances between regions, thus integrating the national market and linking it with external (national and regional) markets, allowing for safe and timely commodity supplies to the market, for safe and sufficient energy supply, and for building up telecommunication networks. In 2009, Ukraine led Poland (72 rank) by this indicator.

“Health and primary education” (component 4) – 67 rank in 2009 for Ukraine. As emphasized by WEF experts, healthy workforce has the highest importance for the competitiveness and productivity of a country, because ill employees are often absent on the

job place or work with a low efficiency. Education, accordingly, up-grades the efficiency of each worker, thus enhancing the labor productivity across the economy. Ukraine lags 28 positions from Poland by this indicator, which ranked 39 in 2009.

“Labor market efficiency” (component 7) – 54 rank in 2009 for Ukraine, reflecting the enhanced performance in relation to 2006. This indicator depends on the flexibility of a labor market, on the relationships between workers’ stimuli, results and best utilization of their skills, which calls for equality between males and females in the business environment. This rating is nearly the same for Ukraine and Poland.

“Innovation” (component 12) – 63 rank in 2009 for Ukraine. Rating of the countries by this indicator was worse than in 2007. This indicator depends on the friendliness of business environment in public and private sector, and reflects the sufficiency of investment in R&D, especially from business, availability of high-level research institutes, collaboration between universities and industry in R&D, and the level of intellectual property protection. Poland ranking 54 in 2009 leads Ukraine.

Indicators that hinder competitiveness enhancement in Ukraine most strongly, can be classified in the two groups, weakly developed (components 9, 11) and the weakest developed (components 1,3,6,8). Their more detailed consideration is given below. Weakly developed aspects of the Ukrainian competitiveness are:

“Technological readiness” (component 9) – 83 rank in 2009 for Ukraine, which is far lower than in 2007 (65 rank). This indicator reflects the intensiveness of adaptation of existing technologies by the national economy, allowing for productivity enhancement at industry (sectoral) level. This is a critical aspect in the enhancement of the national competitiveness. According to the WEF conception, a source of incoming technologies – domestic or from abroad – doesn’t matter for the competitiveness enhancement. However, this conclusion seems to be controversial, because, we believe, utilization of technologies produced on the basis of national R&D will foster the national intellectual (human) potential and its contributions to the national competitiveness enhancement. By this rating Poland led Ukraine in 2009 by 36 positions.

“Business sophistication” (component 11) – 100 rank in 2009 for Ukraine. A considerable decrease of this rating is recorded in relation to 2007 (80 rank), as well as the lag from Poland in 2009 by 50 positions. This indicator contributes to the efficiency enhancement in the production sector and to the enhancement of labor productivity.

The weakest developed aspects of the Ukrainian competitiveness are:

“Institutions” (component 1) – 134 rank in 2009 for Ukraine. Ukraine is too far behind other countries by this indicator in 2009 (by 80 positions). This indicator reflects the performance of the institutional environment in which entrepreneurs, companies and governments interact, attempting to come out to leading positions in the global economy, and (reflects) the possibilities for institutional transformations. It includes indicators reflecting the situation with property rights (intellectual property in particular), ethics and corruption, independence of legal proceedings, efficiency of government, including transparency in formulating the political course, safety and quality of private institutions.

“Macroeconomic environment” (component 3) – 132 rank in 2009 for Ukraine, which reflects aggravation of the economic situation in relation to 2006-2007. This indicator informs on the stability and friendliness of macroeconomic environment, it depends on the government profit/deficit (which is a factor of the financial sector performance), on national savings and inflation rate. For Poland this component is also problematic.

“Labor market efficiency” (component 7) – 129 rank in 2009 for Ukraine, whereas Poland ranked 45. Main factors for this indicator are healthy market competition at domestic and external market, and the minimal barriers for business, erected by administrative interferences.

“Financial market development” (component 8) – 119 rank in 2009 for Ukraine. This indicator went down in relation to 2006-2007 under pressures of the financial and economic crisis. This component shows the reliability and transparency of financial market, the possibilities for allocating free resources available with residents or investments coming from abroad in highly performing and productive sectors, the possibilities to invest business resources for development purposes or implementation of politically neutral investment projects, access to venture capital, loans, existence of well established and regulated stock exchanges. In Poland these processes are regulated continually, which is confirmed by a high rating in 2009 (32).

Unlike many countries, Poland could reinforce its competitiveness in the conditions of the financial and economic crisis, which is evidenced by the change in its GCI rating from 46 rank in 2008 to 39 rank in 2009. This period marked considerable improvements in components of the sub-index “Basic requirements” such as “Institutions”, “Infrastructure” and “Macroeconomic environment”, allowing Poland to move from 71 rank to 56 rank. Vivid positive changes occurred in the components of “Goods market efficiency” and “Labor market efficiency”. Yet, the performance of components in the sub-index “Innovation and sophistication factors” was downward. According to data for 2008-2009, most developed components of the competitiveness in Poland were 5, 8, 10; developed components – 4, 6, 9; weak – 1, 7, 11, 12; weakest – 2, 3.

We believe that the Polish success in enhancing the stability to changes in the external economic environment results from the purposeful government’s actions in elaborating and implementing several government programs focused on enhancing the national socio-economic innovativeness [16]. The main of them are: Government Strategy of the National Development for 2007-2015; Nation’s Strategic Framework 2007-2013 (basis for use of the money from European structural funds); “Areas for Enhancing the Innovativeness of the Economy in 2007-2013”. A significant role in expanding the innovation activities in Poland is with the financing coming from European funds, from which Poland receives 59.5 billion euro for projects purposes. The total value of all the actions in the abovementioned period amounts to 85.5 billion euro.

COMPETITIVENESS, INNOVATIVENESS AND INNOVATION ACTIVITY IN UKRAINIAN REGIONS

According to methodologies [20] competitiveness evaluation at country level, where the competitiveness is characterized by the functional economic criteria at macrolevel, the competitiveness at mesolevel (the competitiveness at regional level) is also assumed to have great importance. The competitiveness of a region is the position of this region and its individual producers at internal and external markets, determined by economic, social, political and other factors [21].

Analysis of the competitiveness in selected Ukrainian regions on the basis of their monitoring conducted by the Foundation “Effective Governance” in keeping with the WEF methodology is given below [10]. Its specificity is that at the first phase ranking of 20 selected Ukrainian regions is performed, and at the second phase the Ukrainian regions are compared with the other 133 countries by 12 GCI components. Data sources are official statistics and information obtained from interviews on a representative sample of managers from nearly fifty companies located across these 20 regions. A comparative analysis of the component indicators (12 GCI components) for the Ukrainian regions assigned top seven and three bottom ranks (the total of 10 regions) in the WEF ranking, with estimated regional

competitiveness indices and ranks of Ukrainian regions in the international comparison, is given in Table 2.

By estimates for 2008, the top rank in the leading group of the Ukrainian regions, but only 59 rank in the international comparison is with the city of Kyiv, where the Gross Regional Product (GRP) per capita is more than twice higher than in Dnipropetrovsk region (2nd rank), and six fold higher than in Trans region (3rd rank). Donetsk and Kharkiv regions took, accordingly, 6th and 7th ranks in the leading group, or 73rd and 76th ranks in the international comparison, after Transcarpathian and Lviv regions and the Autonomous Republic of Crimea (AR Crimea). Bottom ranks (18th to 20th) are, accordingly, with Sumy, Zhitomir and Vinnitsa regions, or 106th to 111th ranks in the international comparison, where GRP per capital is somewhat higher than in Transcarpathian region.

As follows from the ranking, the city of Kyiv is not a leader among other regions by the component "Institutions", by which it has only 17th rank.

Dnipropetrovsk region ranks second due to quite developed infrastructure, average estimates of indicators included in "Efficiency enhancers" and rather high estimates of "Innovation and sophistication factors" (11, 12 components). Donetsk region took the sixth rank due to the low estimate of the sub-index "Basic requirements", resulting mainly from bad performance of the component "Health and primary education", rather low estimates of the indicators included in "Efficiency enhancers" and "Innovation and sophistication factors".

The six rank of Kharkiv region by the component "Innovation" seems to be surprising, as this region is known for its scientific facilities, innovation capacities and science & technology achievements. AR of Crimea ranks 5th in the leading group with most developed components 2, 4, 5, 11; developed components 7, 9; weak component 12; and weakest components 1, 6, 8. The bottom group features the increasing number of bottom ranks by most part of GCI components, although Vinnitsa region has average estimates of the components "Health and primary education" and "Innovation".

Table 2: Component indicators of GCI for selected Ukrainian regions, 2008

Region	Rank	Gross regional product	Regional competitiveness index	Rank in international comparison	Institutions	Infrastructure	Macroeconomic	Health and primary	Higher education and	Goods market efficiency	Labor market efficiency	Financial market	Technological readiness	Market size	Business sophistication	Innovation
					Sub-index 1				Sub-index 2						Subin. 3	
					Number of GCI components											
					1	2	3	4	5	6	7	8	9	10	11	12
Kyiv	1	61 592	4,21	59	17	3	...	1	1	1	2	2	1	...	5	1
Dnipropetrovsk	2	30 918	4,12	65	13	2	...	11	4	5	3	6	4	...	1	3
Transcarpathian	3	10 626	4,09	67	1	10	...	5	7	10	1	19	2	...	4	4
Lviv	4	13 902	4,09	69	3	4	...	7	6	4	19	1	6	...	16	2
Crimea	5	13 898	4,06	72	19	1	...	2	2	20	5	20	10	...	3	15
Donetsk	6	26 028	4,05	73	7	5	...	19	5	12	11	4	3	...	6	5
Kharkiv	7	21 294	4,04	76	9	9	...	4	3	3	8	9	5	...	9	6
Ukraine (regions' average)		20 495	3,97					
Sumy	18	13 622	3,85	106	10	12	...	18	20	19	10	13	19	...	20	19
Zhitomir	19	11 545	3,84	107	5	20	...	15	16	11	4	16	11	...	17	16
Vinnitsa	20	12 061	3,77	111	20	15	...	10	19	17	20	17	20	...	19	13

Source: compiled by the author from [10]

The scientific and practical value of the information on GCI of the regions in form of sub-indices, their components and other indicators can be enhanced by using the methodology for measuring the efficiency of the socio-economic development (CED) at country and regional level [22], and a new methodology for evaluation of economic and social policy effects for CED by distinguishing between economic components (aggregated productivity, production technologies, utilization of potentials) and social components (social justice, shadow economy, utilization of labor) in the integral criterion [23]. It allows to estimate the dynamics of the CED efficiency by economic activity at country and regional level.

Considering the experiences of industrially developed countries and countries that have succeeded in enhancing the competitiveness of national economy in the existing market system, it can be concluded that their excellence rests on the favorable economic environment, technological and innovative competitiveness. The decreasing competitiveness of the Ukrainian economy, found from the WEF data over 2008-2009, is confirmed by selected measures of the innovation activity in the industry (see Figure 1).

The number of innovating enterprises in Ukraine reduced by 1.4% in 2009 in relation to 2007, and the number of enterprises introducing innovations reduced by 0.8%, the share of innovative products sales reduced by 1.9%, and innovative products exports accounted for only 2.02% in the total sales. Even stronger reduction in the two latter indicators was recorded in 2010.

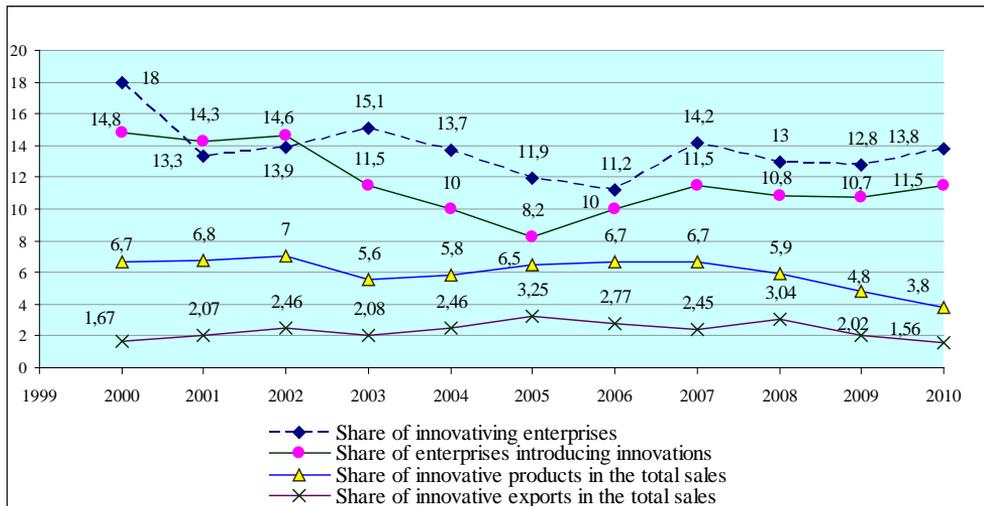


Figure1. Innovation activity in the Ukrainian industry

To extend the analysis of the competitiveness in the Ukrainian regions with consideration to the innovation activity in the regions, integral indices of the innovation activity (I_{int.}) for the regions in the year 2008 are derived using the formula:

$$I_{int.} = \sqrt[6]{K1 \times K2 \times K3 \times K4 \times K5 \times K6}$$

- K1 – coefficient of the innovation activity at industrial enterprises, by region;
- K2 – coefficient of the industrial enterprises introducing innovations, by region;
- K3 – coefficient of new technologies utilization at industrial enterprises, by region;
- K4 – coefficient of the industrial enterprises selling innovation products, by region;
- K5 – coefficient of the innovative products sales by region, as the share of total sales of industrial products;
- K6 – coefficient of the enterprises selling innovative products outside Ukraine, by region.

The coefficients are derived as shares of the total amount (volume) of the indicator equalling 1. Calculations are made by use of data from the Ukrainian State Statistics Committee. The calculated coefficients, integral indices of the innovation activity in regions, and their ranks by the innovation activity derived on the basis of the coefficient K1 and integral indices of the innovation activity I_{int.} are shown in Table 3.

Table 3: Indicators of the innovation activity in selected Ukrainian regions

Region	Rank by K1	K1	K2	K3	K4	K5	K6	I int.	Rank by I int.
Ukraine		0,1302	0,1081	0,1535	0,0926	0,059	0,0318	0,0849	
Kyiv	1	0,2902	0,2621	0,7135	0,2491	0,0990	0,0750	0,2156	1
Dnipropetrovsk	10	0,0848	0,0699	0,0781	0,0579	0,0230	0,0296	0,0513	10
Zakarpatiye	5	0,1216	0,1020	0,0510	0,0941	0,0230	0,0392	0,0614	8
Lviv	6	0,1207	0,0848	0,0645	0,0705	0,0310	0,0215	0,0561	9
Crimea	3	0,1325	0,0994	0,2417	0,0927	0,0230	0,0430	0,0814	4
Donetsk	9	0,1045	0,0945	0,1436	0,0806	0,0460	0,0315	0,0741	5
Kharkiv	4	0,1308	0,1153	0,1130	0,0951	0,0740	0,0297	0,0842	3
Sumy	8	0,1128	0,1053	0,2895	0,1015	0,086	0,0489	0,1066	2
Zhitomir	7	0,1139	0,1111	0,0833	0,0806	0,023	0,0306	0,0625	7
Vinnitsa	2	0,1623	0,1429	0,1883	0,1104	0,010	0,0227	0,0692	6

Source: compiled by the author on the basis of calculations

A brief analysis of the indicators for selected regions shows that:

The city of Kyiv has the top rank by the innovation activity coefficient and the integral index of the innovation activity in the region, which is nearly fourfold higher than the analogous estimates for Dnipropetrovsk region that has the 2nd rank in the rating of global competitiveness of the regions. The peculiar success of Kyiv is in introduction of new technological processes at industrial enterprises. As follows from our estimates, Dnipropetrovsk region has only 10th rank by the coefficient K1 and Iint., due to low estimates for the innovation activity at industrial enterprises, for industrial enterprises introducing innovations and for sales of innovative products.

Transcarpathian region has 5th and 8th rank by the innovation activity coefficient and the integral index of the innovation activity in the region. Its advantages stem from the large numbers of industrial enterprises introducing innovations and utilizing new technologies;

AR of Crimea lagged behind by the innovation activity coefficient and the integral index of the innovation activity in the region, and had 3rd and 4th ranks, which confirms its rather high rank by GCI. This region has high coefficients of the innovation activity at industrial enterprises, introduction of new technological processes at industrial enterprises and innovative products sales outside Ukraine.

Vinnitsa region also has rather high ranks by innovation activity estimates, but it has the bottom GCI rank. This confirms that the region has accommodated the potentials allowing it to join the leading group of regions in GCI ranking through enhancing the weak and the weakest components of the competitiveness.

We believe that the insufficient level of competitiveness, innovativeness and innovation activity in a major part of the Ukrainian regions stems from many reasons, such as: underdeveloped and unevenly located production and social infrastructure required by the

market economy; lack of regulatory instruments with public administrations of many regions for the balanced utilization and development of innovative, socio-economic, ecological, human resources; inadequate institutional background for the initiated action of local administration bodies and local populations, to solve local socio-economic objectives. These can be added by weak foreign economic cooperation, weak interactions between R&D and business, undeveloped forms of public-private partnerships and absence of effective mechanisms for building up regional economic clusters.

These problems can be solved in a way, if future actions on enhancing competitiveness, innovativeness and socio-economic development in the Ukrainian regions, taken at national or regional level, will conform to the innovation and investment development model.

One of the main barriers for enhancing competitiveness and innovation activity of the Ukrainian economy is low investment in R&D and innovation. The R&D capacity of GDP was falling year by year in 2004-2010. According to the State Statistics Committee of Ukraine, while in 2003 the share of R&D expenditures in GDP was 1.24%, in 2009 it reduced to 0.95% and in 2010 – to 0.90%. The government appropriations for R&D were 0.4% in 2003, 0.371% in 2009 and 0.338% in 2010. In a condition like this, the policy should focus on enhancing the efficiency of budgetary funds allocated in the Ukrainian R&D, by reinforcing its application segment.

Also, investment shortage (3059.8 mln.gryvnya in 2003, increase to 11994.2 mln.gryvnya in 2008, and reduction to 7949.9 mln.gryvnya in 2009 and 8045.5 mln.gryvnya in 2010) suppresses the innovation sector being incapable to meet the industrial demand for new technologies. A significant constraint for the development of R&D and innovation in Ukraine is low innovation sensitivity of the national business sector.

Enhancement of the competitiveness and the innovation activity in the Ukrainian economy is in focus of “Program for Development of Investment and Innovation Activities”, elaborated by the government and approved in February 2011 [24], devoted to restructuring, modernization and technological up-grading of the national economy. At the first phase (2011-2012) it’s planned to improve conditions for investors, to provide massive support to sectors working for both domestic and foreign markets, such as agrarian, military-industrial, mining and metallurgy, mechanical engineering and consumer goods manufacturing, and to accumulate investment resources. It is private capital, and not budgetary funds, that is expected to become the main source of investment growth, for which additional stimuli will be elaborated. The second phase (2013-2015) will be focused on the investment growth in high tech sectors: aircraft, information & communication technologies, biotechnologies, nanotechnologies and new materials, pharmaceuticals and medical devices.

Implementation of the Program is associated with reforms in R&D and innovation sector, which, as follows from the government plan, will involve two phases. The first phase (2011-2012): creation of institutional and economic background for intensification of innovation processes through the revival and renovation of research facilities at universities, building up and activation of regional innovation clusters, small innovative enterprises, and institutes for development. The second phase (2013-2015): effective utilization of already created innovative products through the strict system for financial support to innovation activities, mechanisms to reduce price of loans and stimulate commercial banks to massive crediting (2013-2015) of innovation projects.

We believe that for the effective accomplishment of the Program the government must elaborate and implement periodic and systematic measures at national and regional level, to diminish gradually the effects of the weakest and weak components of the Ukraine’s competitiveness. This should be done on the basis of the analyzed existing indicators and the ones outlined in future WEF reports. It’s expected that such political course will allow Ukraine to join the club of 50 most competitive countries of the world till the year 2020

[25]. This goal is feasible in view of the available competitive advantages in Ukraine such as high quality of intellectual and human capital, developed research, technology and innovation capabilities, developed production infrastructure, low cost of workforce, sufficiently diversified development of territories and many others.

CONCLUSIONS

1. The methodology for analysis of GCI indicators by breaking GCI components into the four groups is applied for Ukraine. Downgrading of the Ukrainian GCI in 2008-2009 is caused by the government's disregard of the need to adopt the innovation and investment model of development at national and regional level, and of the effects of the global financial and economic crisis.
2. Analysis of the competitiveness and the innovation activity in Ukrainian regions shows that the scientific and practical value of measurement of the competitiveness at regional level by WEF methodologies can be enhanced by use of the methodology for evaluation of the effects of economic and social components on socio-economic development of a region.
3. The most effective measure to enhance the competitiveness, the innovativeness and the innovation activity in Ukraine is in launching radical economic restructuring in favor of high tech manufacturing and intellectual, scientific and education services.

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