

РАЗДЕЛ 5. ИННОВАЦИОННЫЕ И ЭКОЛОГИЧЕСКИЕ АСПЕКТЫ УПРАВЛЕНИЯ ПРЕДПРИЯТИЕМ

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LEVEL OF INNOVATION AND COMPETITIVENESS OF INDUSTRY AFTER ACCESSION OF POLAND TO THE EUROPEAN UNION

Abstract: In the paper, chosen aspects of the level of innovation and competitiveness of Poland in 2001-2005 mainly as compared to other EU countries have been presented. The empirical data originate from the Eurostat and GUS (Polish Central Statistical Office) materials. The performed analysis enables to assess the position of Poland in chosen areas as compared to other UE countries and then suggests the possibility to prepare rankings and to perform selection of the economic enterprises.

Keywords: innovation, competitiveness, innovation factors, new orders in the industry, costs of employment, gross fixed capital formation

In the conditions of the market openness and liberalization of cash flow, the competitiveness exacerbation appears in global economy. In this situation the economic growth and macroeconomic balance are consequences of an enterprise's ability to undertake competitive challenges among the factors which influence the competitive position a significant importance has innovative activity. Moreover, the creativity is on the first position among the systematic-regulative activities which are determined within social and economical program of the European Union in the form of the Lisbon Strategy.¹

Except the innovation, to achieve ambitious aims of the Lisbon Strategy some activities come in help i.e.:

- Liberalization and integration of these markets and sectors where common market de facto did not include: telecommunications, energetics, transport, mail and also financial services and the total services market
- Development of entrepreneurship, deregulation and better support from the administration by easier access to the capital and technology, creation of even competition field,
- Social cohesion i.e. increase in employment and change in social model: increase in professional activity, making job market flexible, improvement in education, upgrading the social security system, eradicating the poverty and social exclusion
- Caring of the fixed foundations of the development and natural environment

Creativity is a specific tool of entrepreneurship, an activity which gives the resources strong possibilities to create wealth and is also the distinctive ability which leads to advantage, competitiveness²; it is also a form of entrepreneurship which reflects in continuous seeking for new combinations of factors, created for reaching and multiplication of a capital, mainly profits³.

It is common for the literature to make difference between three types of innovation, depending on their effect on the change in behaviour of users. They include the following product innovations:

¹ W. Szymański, Rozstrzygająca rola przedsiębiorstw w dostosowaniu gospodarki do integracji europejskiej i globalizacji, Polskie przedsiębiorstwa wobec standardów europejskich, praca zbiorowa pod redakcją K. Kucińskiego, Matenaty i Prace IFGN SGH, Warszawa 2003, s. 11

² P.F.Drucker, Innowacje a przedsiębiorczość, Praktyka i zasady, PWE, Warszawa 1972, s. 140

³ W.N. Grudzewski, I.K. Hejduk, Zarządzanie wiedzą w przedsiębiorstwie, Difin, Warszawa 2004, s. 16

- Continuous – i.e. this which do not require the change in users' behaviour patterns, and they are caused by e.g. fashion
- Dynamically continuous – i.e. which change the routine behaviour of users but not radical
- Discontinuous i.e. which creates modern behaviour¹

In the presented classification of innovation a technical and marketing aspects are hidden.

According to the technical approach, the innovations mean industrial application of a new technical or technological solution while the marketing approach to the product innovation means that the product should be accepted as a new one by the buyers, and the technical changes are not necessary. Therefore innovations are the products portioned or packed in a different way².

First document, which defines new frames for innovation policies in the individual European Union countries, was the Action Plan on Innovation in Europe from 1996.

On the basis of that plan, the practical tools was implemented, i.e. Trend Chart on Innovation, which is used to collect data and analyse information on innovation policy at domestic and commonwealth level with special consideration of the finances for innovation implementation, intellectual ownership rights and transfer of technology between education and industry. It is also an European forum for comparison (benchmarking) and exchange of experience between individual countries.

To maintain comparability of data, the European Innovation Scoreboard is based on twenty factors grouped in four categories, such as:

- Human resources,
- Creation of new knowledge,
- Transfer and application of the knowledge,
- Investment financing.

Human resources for the innovation purposes are verified by such factors as:

- percentage of persons with technical university degree (aged 20 – 29) on the subject such as sciences, mathematics, statistics, information technology, engineering, production and architecture
- percentage of persons with university degree (aged 25 – 64)
- percentage of persons who take part in further, continuous education (aged 25 – 64); improving skills and learning new ones is one of the main assumptions of an economy based on the knowledge, using such forms of extending education such as: courses, seminars, arts learning, foreign languages.
- employment in the industries of medium-high and high technology in the sectors such as: aircraft and spacecraft production, radio, television and telecommunications equipment and devices, production of office devices and computers, pharmaceutical chemicals production, chemicals and chemical products manufacturing, production of machines and electrical equipment, production of machines and devices, production of medical, precision and optical instruments, clocks, production of vehicles, trailers and semitrailers. This factor reflects the participation of the people employed in the above listed industries as compared to the total of people employed in all the industries.
- percentage of persons employed in three sectors: mail and telecommunication services, information technology services and the research sector services

The assessment of new knowledge creation is based on four factors:

¹ A H. Jasiński, Przedsiębiorstwo innowacyjne na rynku, Książka i Wiedza, Warszawa 1992, s. 8

² M. Hoffer, Determinanty strategii nowego produktu polskich przedsiębiorstw przemysłowych, Wydawnictwo Uniwersytetu M. Kopernika, Toruń, 1998, s. 28

- total of domestic expenditure on R&D as a percentage of GNP. This factor is built as a difference between domestic expenditures and the enterprises' expenditures.
- expenditures on the R&D activities as a percentage of GNP in enterprises
- number of patent applications to European Patent Office EPO
- number of patent applications to United States Patent and Trademark Office

Transfer and application of the knowledge is based on three factors which were not the subject of research in candidate countries in 2002.

Main factors which identify financing of innovation include:

- investments of venture capital nature in computer, electronic, biotechnology and automatic devices industry, and in finance sector
- percentage of persons who have the access to the Internet from their own homes,
- expenditures of the Information and Telecommunication Technology sector.

The empirical research on the innovation and competitiveness of the Polish economy include the assessment of:

- strong and weak sides of the individual EU members,
- dynamics of new orders in the industry,
- index of costs of employment,
- dynamics of gross fixed capital formation,
- dynamics of industrial production,
- dynamics of production in industrial processing sector.

Diagnosis of innovation of economy of the European Union is synthesized by the assessment of strong and weak sides of each new EU members (see table). The most frequent strong side for new EU countries is a percentage of persons with a technical university degree and a percentage of persons with an university degree. The weak side of the investigated countries is a small number of patent applications to European Patent Office, poor access to the Internet, poor employment in the industries of medium-high and high technology. From the presented table No. 1 it results that the highest innovation ability possess Slovenia, Hungary and Czech Republic. Poland is one of the poorest countries among the new members of EU in terms of the innovation research and competitiveness. Poland is comparable to Spain (due to the similar area, population and the development degree) at the time of its accession to Union in 1986. Spain benefited a lot from its presence in the European Union and reached the highest level of development. Poland has a long way ahead to reach the level of development comparable to Spain.

While analysing the enterprises the extent of new orders in the industry should be considered. The orders are determined as a value of contracts in terms of delivering goods and providing services. Factor of new orders in the industry shows at increase in the demand on goods and services and it helps in assessment of future production. Comparing data from the new orders in the industry it should be found that in EU 25 scale, this factor increased from 9.6% in 2004 to 11.1% (according to the data from January 2006). In 2004, the percentage increase of the described factor as in comparison to analogous period of the previous year was highest in Latvia, 21.6% and in Sweden, 18.6%. In Poland, this factor was decreased almost by 5% as compared to 2003. Note the changes in factor of new orders in the industry during 2005-2006. While in 2005 this factor decreased in Poland by 4% as compared to its level of 2004, in first month of 2006 its increase by as much as 97.8% has been observed. The comparison analysis of changes in the described factor within the EU enables to situate Polish industry on the first place here. The percentage change in the factor of new orders in the industry in January 2006 in Denmark amounted to 25%, in Estonia 24.4% (see Table No. 2)

Table 1. Synthetic approach to strong and weak sides of innovation in individual new members of the EU

Country	Main strong sides	Main weaknesses
Cyprus	percentage of persons with university degree and access to the Internet	Small employment in the industries of medium-high and high technology, low enterprises' expenditures on R&D
Czech Republic	Increase in number of persons with a technical university degree and growing number of people with university degree, increase in budget expenditures on R&D	Small number of patent application to EPO and USPTO
Estonia	percentage of persons with a technical university degree, increase in out-of-budget expenditures on R&D, increase in number of patent application to EPO and USPTO	Low percentage of people completing their education
Hungary	increase in budget and out-of-budget expenditures on R&D, increase of expenditures of ICT sector	Decreasing percentage of persons with technical university degree, access to the Internet
Lithuania	percentage of persons with university degree, increasing participation of enterprises' expenditures on R&D,	Low and decreasing employment in the industries of medium-high and high technology, access to the Internet
Latvia	Growing employment in the industries of medium-high and high technology, increase in out-of-budget expenditures on R&D, increase in number of patent application to EPO	Small number of patent application to USPTO, access to the Internet
Malta	percentage of persons with technical university degree and access to the Internet	patent application to EPO and USPTO,
Poland	Growing percentage of persons with technical university degree and with university degree, increase of expenditures of ICT sector	Small number of patent application to EPO and USPTO, access to the Internet
Slovenia	increase in number of patent application to EPO, growing employment in the industries of medium-high and high technology,	Decrease in number of persons with university degree,
Slovakia	growing employment in the industries of medium-high and high technology, increase in percentage of persons with technical university degree	Decrease in public expenditures on R&D activities, small number of patent applications to USPTO

Source: European Innovation Scoreboard 2003, K. Koziol, Innowacyjność nowych członków Unii Europejskiej ze szczególnym uwzględnieniem Polski, w pracy badawczej pod redakcją naukową E. Urbańczyka, Strategie wzrostu wartości przedsiębiorstwa, Teoria i praktyka, Tom I, Wydawnictwo Kreos, Szczecin 2005, p. 447

Table 2. New orders in the industry in 2005 - 2006*

		Percentage change as compared to analogous period in the previous year (t-12)		
		2005		2006
1	2	3	4	5
UE25	UE25	9,6	3,5	11,1
Euro-zone	Euro-zone	8,2	7,4	9,7
Belgium	BE	-0,8	7,1	7,2
Czech Republic	CZ	3,9	10,1	19,3
Denmark	DK	14,6	11,5	25,0
Germany	DE	9,4	5,4	15,6
Estonia	EE	13,0	12,1	24,4
Greece	EL	-	-	-
Spain	ES	-	-	-
France	FR	8,3	16,5	6,1
Ireland	IE	9,6	7,6	9,5

1	2	3	4	5
Italy	IT	12,1	-1,0	7,8
Cyprus	CY	.	.	.
Latvia	LV	21,6	10,4	-8,7
Lithuania	LT	17,1	7,1	11,2
Luxembourg	LU	10,5	3,8	.
Hungary	HU	-0,9	-9,0	22,8
Malta	MT	-9,3	-7,4	.
Netherlands	NL	2,6	7,4	11,7
Austria	AT	8,4	5,7	.
Poland	PL	-4,7	-3,9	97,8
Portugal	PT	1,9	12,4	1,1
Slovenia	SI	.	.	.
Slovakia	SK	-3,3	8,9	-0,7
Finland	FI	.	.	.
Sweden	SE	18,6	0,0	19,9
United Kingdom	UK	.	.	.

* data from 2006 concern the orders from January of the year
Source: WWW.euroopa.eu.int

A significant criterion of assessment of competitiveness of Polish industry as compared to the EU is the index of costs of employment and it concern total cost of employment of workforce calculated per 1 working hour, which is incurred by an employer within the short period of time (quarter). Costs of employment in total include gross remuneration and the remaining employment costs. From the data contained in the Table No. 3 it results that for the Euro zone the index of costs of employment in total in January 2005 as compared to the analogous period of the previous year amounted to 3.2 and in December that year it decreased and amounted to 2.4. The level of the index of employment costs for EU25 was similar to this of Euro zone: in I quarter of 2005 it amounted also 3.2 and in IV quarter of 2005 it amounted to 2.9. In Poland, index of employment costs was higher than the average in EU25 in I quarter of 2005 by 25% and at the end of the year by 82%. In last quarter of 2005 Poland, in terms of the index of employment costs within the EU25 countries reached 12th position. The costs of employment of workforce calculated per 1 working hour was in Poland lower than in such countries as: Germany, Portugal, Malta, Sweden, Denmark, Cyprus, United Kingdom, Spain, Finland, France and Austria.

Table No. 3 Index of employment costs – in total

1		Percentage change as compared to analogous period in the previous year (t/t-4)	
		Data compensated with working days	
		2005	
		I-III	X-XII
1	2	3	4
UE25	UE25	3,2	2,9
Euro-zone	Euro-zone	3,2	2,4
Belgium	BE	2,9	.
Czech Republic	CZ	3,7	6,5
Denmark	DK	3,1	2,9
Germany	DE	1,3	0,4
Estonia	EE	9,4	14,2
Greece	EL	.	.
Spain	ES	4,3	3,6

1	2	3	4
France	FR	3,3	3,7
Ireland	IE	4,5	.
Italy	IT	.	.
Cyprus	CY	5,8	3,2
Latvia	LV	15,2	16,6
Lithuania	LT	12,5	13,7
Luxembourg	LU	6,9	7,7
Hungary	HU	9,4	7,6
Malta	MT	3,0	2,0
Netherlands	NL	2,5	.
Austria	AT	3,9	3,8
Poland	PL	4,0	5,3
Portugal	PT	2,0	0,7
Slovenia	SI	7,7	7,5
Slovakia	SK	7,5	9,2
Finland	FI	3,8	3,4
Sweden	SE	3,2	2,8
United Kingdom	UK	4,3	3,3

Source: as for Table No. 2

In 2004 the gross fixed capital formation in the European Union increased, as compared to 2003, by 2.9%. In the United States they increased by 8.4%, mainly as a result of increase in the capital on the metal products and the transport machines and devices. Among the described countries, the highest dynamics of investment in 2004 presented Latvia (increase by 23.8%), Lithuania (by 12.3%), Cyprus (by 11.6%) and Russia (by 10.8%). The gross fixed capital formation level similar to the one observed in 2003 was maintained in Austria, while in Germany, in fourth consecutive year, the decrease in investment appeared.

In 2005 in most of described countries the dynamics of the gross fixed capital formation was higher than for the gross national product. In the European Union in consecutive quarters of 2005 the successive increase in the fixed capital increase was observed. The highest increase in the investment in a year scale was observed in Belgium, Latvia, Hungary, Spain and Sweden and also in the United States. The gross fixed capital formation was decreased as compared to 2004 in Finland, Portugal and Italy.

Table No. 4. Dynamics of gross fixed capital formation * (fixed prices)

Countries	2001	2002	2003	2004		2005*
	Previous year =100			1995=100		
1	2	3	4	5	6	7
E U	100,5	98,8	100,8	102,9	129,3	103,1
Austria	98,5	95,0	106,1	100,6	117,1	100,4
Belgium	100,2	97,7	99,3	104,2	123,5	.
Cyprus	103,2	108,1	100,7	111,6	142,8	.
Denmark	98,6	100,5	101,6	103,3	141,2	105,3
Estonia	113,0	117,2	108,5	106,0	220,1	.
Finland	103,9	96,9	98,5	105,0	146,3	.
France	102,4	98,3	102,7	102,5	133,2	103,6
Greece	106,5	105,7	113,7	105,7	207,7	.
Spain	104,5	103,3	105,6	104,9	168,9	107,4
Ireland	99,8	103,7	105,6	108,0	233,4	.

1	2	3	4	5	6	7
Latvia	113,5	111,1	114,0	112,3	241,0	.
Luxembourg	110,0	98,9	93,7	103,5	152,5	.
Lithuania	111,4	113,0	112,3	123,8	428,8	.
Nederland	100,2	95,5	96,5	102,9	122,6	103,4
Germany	96,4	93,9	99,2	99,8	101,0	100,8
Poland	91,2	94,2	99,5	105,1	163,9	105,3
Portugal	97,1	94,9	90,1	101,3	124,5	.
Czech Republic	105,4	103,4	104,7	107,6	127,6	.
Slovenia	113,9	99,4	98,5	102,5	140,6	.
Slovakia	100,4	100,9	107,1	105,9	189,0	.
Sweden	99,0	97,4	101,1	105,1	131,3	.
Hungary	105,9	109,3	102,5	108,4	193,4	.
United Kingdom	102,4	103,0	100,0	104,9	148,6	102,8
Italy	101,9	101,2	98,2	102,1	127,7	.
China	113,1	113,3	.	.	193,5 ^a	.
Japan	98,6	94,3	100,9	101,6	99,2	104,4
Russia	112,3	103,1	112,8	110,8	119,8	.
United States	98,2	96,5	103,3	108,4	155,0	107,4

^a Data compensated by seasons.

2005^a - data from III quarter

Source: as in Table No. 3

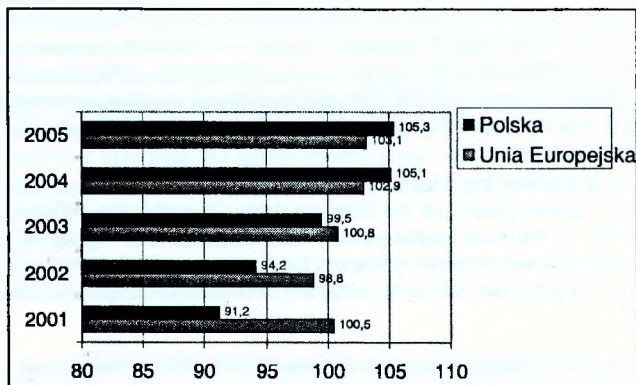


Fig.1 Dynamics of gross fixed capital formation

Source: as in Table No. 4

In 2001-2003 the dynamics of gross fixed capital formation in Poland was decidedly lower than its average level for the EU. According to the data from 2004-2005 the situation changed favourably: the dynamics of gross fixed capital formation in Poland was by 2% higher than the average in the EU.

Next criterion of the competitiveness assessment for business entities is the dynamics of the industrial production. In 2004 the industrial production in the European Union increased, as compared to 2003 by 2.2%. A significant acceleration of the dynamics in the industry as compared to the one observed in previous year was observed in Poland, Lithuania and the Czech Republic (increase of production appropriately by 12.2%, 10.9% and by 9.2%) and among the countries outside the EU – in China (increase by 11.1%). In 2004, the increase in industrial production in a year scale, first time

since 2000, was observed in the United States and United Kingdom (appropriately by 4.2% and by 0.4%). In Ireland, after very high increase of production in the nineties, since 2001, gradual slowdown in dynamics in the industry was observed – and in 2004 the production was only by 0.3% higher than the previous year. Production in the industry decreased as compared to 2003 in Portugal, Italy and slightly in Denmark.

In 2005 the dynamics in the industry was weakened as compared to the observed in 2004. In the consecutive three quarters of 2005 the industrial production in European Union increased in a year scale within 0.5%-1.1%. The production increased, with a rate significantly over an average one for the EU, in Luxembourg, Estonia, Hungary, Czech Republic and Lithuania and also in the countries outside the European Union – in China. The slowdown in the production dynamics in quarters of 2005 in comparison to the one observed in 2004 was found for Finland, Greece, United Kingdom and in Italy. In Germany, after several years of slow rate of the industrial production, since 2004 its growth has been observed and in consecutive quarters of 2005 the production in a year scale increased within 2.4%-3.1%.

The dynamics of the industrial production in Poland was favourable. It was higher than the average for EU in 2003 by 7.7%, in 2004 by 10% and in 2005 by 4% (see chart No. 2)

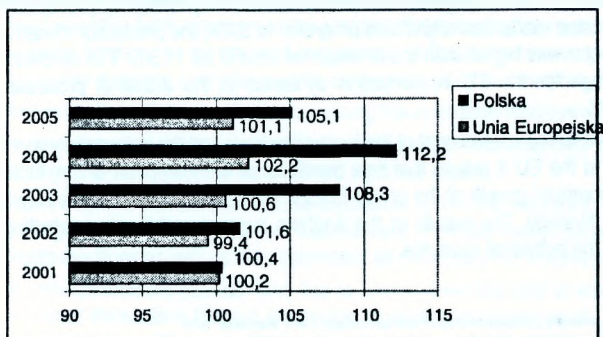


Fig.2 Dynamics of industrial production

Source: Eurostat data

The noticeable fact are the changes in the production dynamics in the industrial processing sector. The production in the industrial processing in the European Union in 2004 increased, as compared to 2003, by 2.4%. Its highest increase was observed for Poland, Lithuania, Czech Republic and Estonia. In Japan and in the United States, since 2002 the successive dynamics improvement was observed and in 2004 it amounted to, respectively, 5.5% and 4.7%. The decrease in production in a year scale in this sector of the industry was found for Denmark, Portugal and in fourth year – in Italy.

In three quarters of 2005, in industrial processing the production was increasing the most in new member countries of the European Union: Estonia, Lithuania, Czech Republic and Hungary. Over the average for the EU, in the described period the increase in processing production was also observed in Germany (within 2.5%-3.2%). In Japan in United States, after growth in the dynamics in 2004, in next quarters of 2005 the gradual slowdown was found and in third quarter the increase in a year scale in Japan was insignificant while in the United States it amounted to 3.0%. The decrease in the industrial processing in three quarters of 2005 as compared to the analogous periods of the following year was observed in Greece, Spain, Portugal and the Italy.

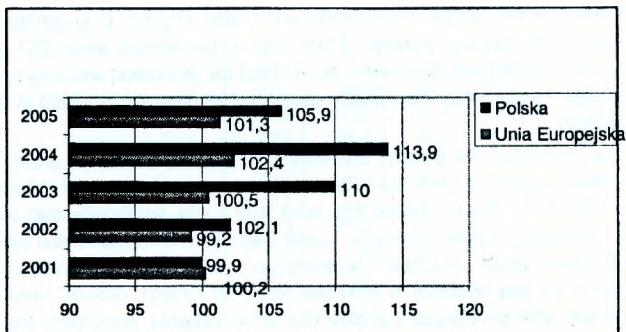


Fig.3. Dynamics of production in industrial processing sector

Source: Eurostat data

As compared to the average for the EU in terms of dynamics of production for the industrial processing, Poland made here significant progress. In 2004, the production dynamics in the industrial processing sector was higher than the average for the EU by 11.5%. The difference between Poland and the average for the EU in production dynamics in the industrial processing sector in 2005 amounted 4.6%.

From the presented assessment of the innovation level and the competitiveness of Polish economy as compared to the EU it results that new members of the European Union, including Poland, may inhibit the economical growth of the united Europe and may contribute to the slowdown in realization of the Lisbon strategy. The results of the analysis suggest ranking and selecting of the economic enterprises of the individual countries.

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GENERAL ASPECTS OF INNOVATION MANAGEMENT IN COMPANIES

Summary: The purpose of the present paper is to show the most important aspects of the innovation management process. We also aim at determining its stages and identifying characteristics and skills that may be useful in its realization. It is particularly important to look at company's relations with macro and micro-environment since proper relations of the environment with company's resources facilitate the transfer of knowledge to organizations and thus speed up the development of innovations.

Keywords: Innovation management, stages of the management process, skills useful in the management process, macro and micro-factors.