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ІННОВАЦІЇ ПОЛЬСЬКИХ КОМПАНІЙ ТА ЕКОНОМІЧНОГО ЗРОСТАННЯ КРАЇНИ

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В останній період Польщі, незважаючи на низький рівень інноваційного бачив швидко економічного зростання. Це збільшення було засноване на процес швидкого накопичення капіталу в потік технологій із закордону і швидке зростання рівня інформатизації суспільства. Ці фактори, проте, повільно виснажуються. Польща, щоб не відстати розвитку держави Європи повинні крок на шлях інноваційного розвитку.

Мета статті – діагностика поточного стану і оцінку перспектив розвитку інновацій в Польщі. У статті описано поточний рівень інновацій, перешкоди до розвиток інноваційних країни і звернув увагу на перспективи розвитку. В розвитку прикладної аналіз літератури та статистичні дані про польського.

Ключові слова: *інновації, підприємництва, інновацій, технічного прогресу, людський капітал, інтелектуального капіталу.*

ИННОВАЦИИ ПОЛЬСКИХ КОМПАНИЙ И ЭКОНОМИЧЕСКОГО РОСТА В СТРАНЕ

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В последний период Польша, несмотря на низкий уровень инноваций стал свидетелем быстрого экономического роста. Это увеличение было основано на быстрое накопление капитала в потока технологии от за рубежом и быстрое увеличение уровня образования общества. Эти факторы, однако, постепенно истощаются. Польша, чтобы не отстать от развития европейских государств должны шаг на пути инновационного развития.

Целью статьи является диагностика текущего состояния и оценки перспектив развития инноваций в Польше. В статье описывается текущий уровень инноваций, барьеры для развития инновационных страны и обратил внимание на перспективы развития. В разработке прикладного анализа литературы и статистические данные на польском.

Ключевые слова: *инновации, предпринимательство, инновации, технологический прогресс, человеческий капитал, интеллектуальный капитал*

INNOVATIVENESS OF POLISH COMPANIES AND THE ECONOMIC GROWTH OF THE COUNTRY

Miczyńska – Kowalska M.

Recently, Poland, despite low level of innovation, experienced quick economic growth. This growth involved quick accumulation of capital, inflow of modern technology from abroad and rapid improvement of the society's education level. These factors are gradually being depleted. Poland, just to keep up with the development of European countries, has to follow the path to innovative development.

The aim of this article is the diagnosis of the current state and the assessment of perspectives for innovation growth in Poland. In the article characterised was the current level of innovation, barriers in the national innovation development and growth perspectives were pointed out. This assessment is based on literature analysis and statistic data concerning Poland.

Key words: *innovation, business, innovative economy, technological progress, human capital, intellectual capital.*

In the modern economy the factor of economic growth is represented by innovations.The term «innovation» comes from Latin language. Innovare means creating something new. «Innovation should be understood as «every change, which leads to creation of a new value for an organisation of the society.»[1]Commonly used is also the OECD definition, which distinguishes between four types of innovations introduced by companies. This is the Oslo methodology.[2] Innovation is the employment of new or significantly improved goods (wares, services), processes, marketing and organisational methods, changing relationships with the environment or in the organisation of work. The definition also lists the following types of innovation:

1. Product,
2. Process,
3. Organisational,
4. Marketing.[3]

Broadly speaking, innovations and innovativeness imply social and economic activity, the aim of which is a new use of resources, new ideas, new methods of operation and introduction of changes, which involve replacing the current state with something else. Creation of innovation involves specific phases: research, financial, organisational and commercial. The process is characterised by the combination and interdependency of the listed stages, high risk, use of various information sources, as well as significant costs.[4]

In accordance with the reports of the National Bank of Poland or 2016 and 2017[5], Poland is listed as one of the least innovative countries.

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[1] M. Raich, Globalna transformacja biznesu i społeczeństwa, Difin, Warsaw 2011, p. 226.
[2] OECD, 2005, pp. 49-55.
[3] Cf. E. Łyżwa, Innowacyjność przedsiębiorstw a konkurencyjność regionów, Ed. Jan Kochanowski University, Kielce 2014, p. 77.
[4] E. Pawlak, Innowacje w kulturze organizacyjnej mikro i małych przedsiębiorstw, [in:] J. Szpon, [ed.] Innowacje jako źródło konkurencyjności nowoczesnego przedsiębiorstwa, Economicus, Szczecin 2009, p. 13.
[5] https://www.nbp.pl/aktualnosci/wiadomosci_2016/20160530_Raport_innowacyjnosc.pdf

Eurostat data of 2017, just like the report NBP indicate that Poland is one of the least innovative country in EU:

Table 1. Share of enterprises that had product innovations, 2012–2014.

	Product innovation new to the market	Product innovation new to the enterprise		Product innovation new to the market	Product innovation new to the enterprise
EU–28	**12.5**	**11.4**	Denmark	10.7	13.7
Ireland	22.2	13.4	Greece	15.0	8.4
Finland	20.4	14.2	Cyprus	14.9	8.0
Germany	13.3	21.1	Lithuania	8.9	12.0
Netherlands	19.0	13.5	Malta	8.1	11.5
Belgium	22.0	9.8	Croatia	8.2	10.6
Sweden	18.4	12.9	Slovakia	7.5	5.0
Austria	21.9	8.9	Hungary	7.0	4.9
Luxembourg	18.4	10.3	Spain	5.7	5.5
Portugal	14.5	13.9	Estonia	1.1	9.9
France	18.5	9.2	Bulgaria	5.7	5.2
United Kingdom	10.8	16.0	**Poland**	**5.2**	**4.3**
Slovenia	17.5	7.7	Latvia	6.3	2.2
Czech Republic	13.5	11.6	Romania	1.3	2.3
Italy	15.5	9.2			

Source: http://ec.europa.eu/eurostat/statistics-explained/index.php/Innovation_statistics

The data available in the published reports is limited to 2014, more recent are not yet available, however, Poland is still among the least innovative countries.

Because of that, it needs to be stated that our country requires a new economic transformation. Poland stands before the challenges of the future. The last 20 years brought significant economic growth, caused by accumulation of capital and increased employment.Because of the inflow of direct foreign investments and opening the economy to international markets, EU primarily, allowed Poland to learn how to generate added value.Thanks to this and to the development of education our country shortened the distance between us and countries of Western Europe in terms of physical and human capital in production processes. This potential is being depleted, however. This is why Poland needs to follow the path set by the innovative economy. In the aforementioned report of 2017 five barriers were mentioned, which are the reason why Poland significantly deviates from the good practices of highly innovative countries such as Denmark, Sweden or Finland.[6] Among them are:

1. Low level of trust of the society and trust towards institutions,
2. Lower intensity of research carried out in Polish facilities in comparison with foreign research institutes, which is reflected in statistics concerning the quality and number of publications in scientific periodicals.
3. Insignificant influence of Polish research units in international scientific cooperation,
4. Low innovation level of small and medium businesses,
5. Relatively few patent submissions.

In order to overcome the aforementioned barriers harmonised strategy and innovation support programmes should be implemented throughout the country. It would involve establishing an institution, which would be responsible for coordination of works in various ministries and government agencies. The authors of the report also point out the improvement of information transfer in available financing forms for small businesses and more focus on supporting innovative companies during the initial stage of their development. Another way could by the introduction of tax deductions for entities intending to carry out their own research and development rather than acquire existing technologies abroad. Economists from NBP also suggest removing or limiting of market entry barriers of professional services and shortening insolvency procedures along with decreased sanctions for companies that failed and announced their bankruptcy.

Entering the path to innovation requires gradual withdrawal of the use of imported technologies and innovative production techniques, or methods of work organisation and management in favour of active development and implementation of national innovations, both independently and in cooperation with foreign partners.

Innovations among Polish businesses are rare. However, they do spend relatively high sums on innovations. Poland is on the 12th position in Europe (1.005 million Euro).

Polish business structure involves mostly micro-companies and small companies. The most innovative are large industrial companies; to a higher degree than service companies. The size of a company also influences its export capabilities and foreign investments. Growth of a company also means higher accumulation of knowledge and skills as well as finding new markets. Therefore, large and medium companies tend to be more innovative than small companies. CIS data indicates that most Polish companies base their innovative activity on upgrading their machinery. They involve

[6]*Potencjał innowacyjny gospodarki: uwarunkowania, determinanty, perspektywy, May 2016 NBP https://www.nbp.pl/aktualności/wiadomości 2016/20160530 Raport innowacje; https://businessinsider.com.pl/technologie/nauka.bariery dla innowacyjności.*

about 55% of their innovation spendings. However, in order for the Polish economy to be more innovative, spendings on our own R&D activity need to be increased. The leader of innovation is the Mazowieckie Voivodeship – 95.9 points in 2017.[7] It scored the highest in relation to the work efficiency, R&D spendings, number of people working in R&D and the number of submitted patents. It is related to the research activities of Warsaw and placement of company headquarters in Warsaw. It is also a beneficiary of EU for years 2014–2020. Further in the ranking are Voivodeships: Małopolskie, Dolnośląskie and Pomorskie. They reached 69.9 points – which is above Polish average.

Polish innovation activity is distributed unevenly. It is concentrated mostly in urban and academic hubs. It is interesting that the high place of Lubelskie Voivodeship (63.7 points), where low GDP per capita does not involve lack of innovativeness. Another example showcasing that even regions with low GDP per capita can be leaders of innovativeness is Podkarpackie Voivodeship, second last in Poland in relation to PKB and in the ranking of Millenium Bank. The worst in terms of innovation is Warmińsko–mazurskie Voivodeship. Mostly agri–food as well as woodworking and furniture sectors are developed there because of access to large forested and agricultural areas. It is also one of the most attractive regions to tourism.

Based on data from the aforementioned reports it needs to be said that the foundation of the future economic growth in Poland will be TFP/Total Factor Productivity – total increase in productivity of production factors. The traditional model of growth based on accumulation of physical and human capital, relevant during the previous years in Poland is becoming insufficient. The most important factor influencing the growth of TFP is technological progress, which can be achieved through innovativeness of national economy as well as skilful use of the effects of international diffusion of innovation.

Currently the EU support system is a great chance for Polish businesses. However, the results of the research indicated that entrepreneurs are afraid of financial losses associated with failed works involving commercialisation of the results of the research. It is the reason behind reluctance to cooperate with R&D units[8], in spite of the fact that «Poland achieved an impressive level of spending on R&D activities.Between 2002 and 2010 the cumulative growth amounted to 122.5%, while the average growth rate was at 10.5%3 yoy, whereas the respective rates for EU were 27.4% and 3.1%. High growth dynamic is characteristic for emerging economies of the region, however, the level of spendings on R&D in Poland is still relatively low. Average spendings on R&D in countries of the EU 27 in 2010 reached 2% in relation to GDP, in Poland the indicator was at 0.74%.»[9]

The basic innovation indicators are expenditure indicators, performance indicators. Among expense indicators listed are: expenditures on research and development (R&D) – presented as GDP per cent. It comprises expenditures of companies (BERD), expenditures on higher education (HERD) and expenditures of governments (GOVERED).Unfortunately, Poland has weak ratings in relation to other European and OECD countries.

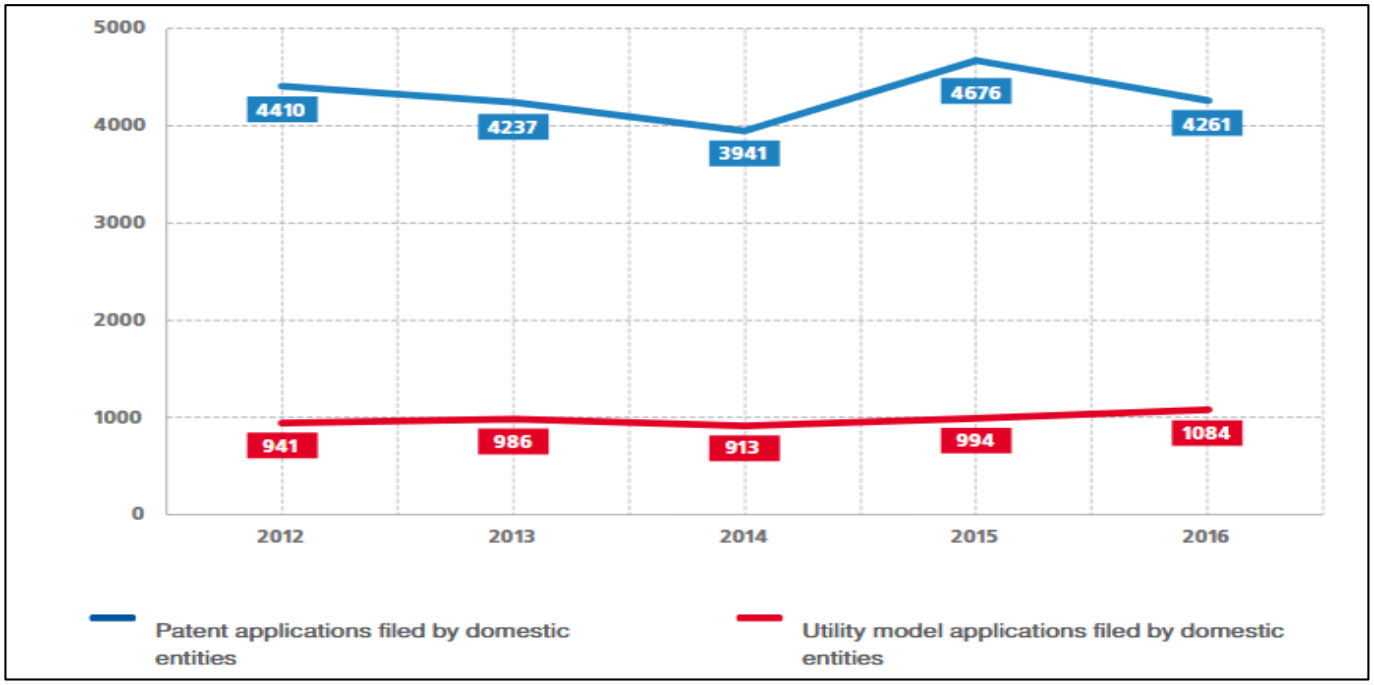


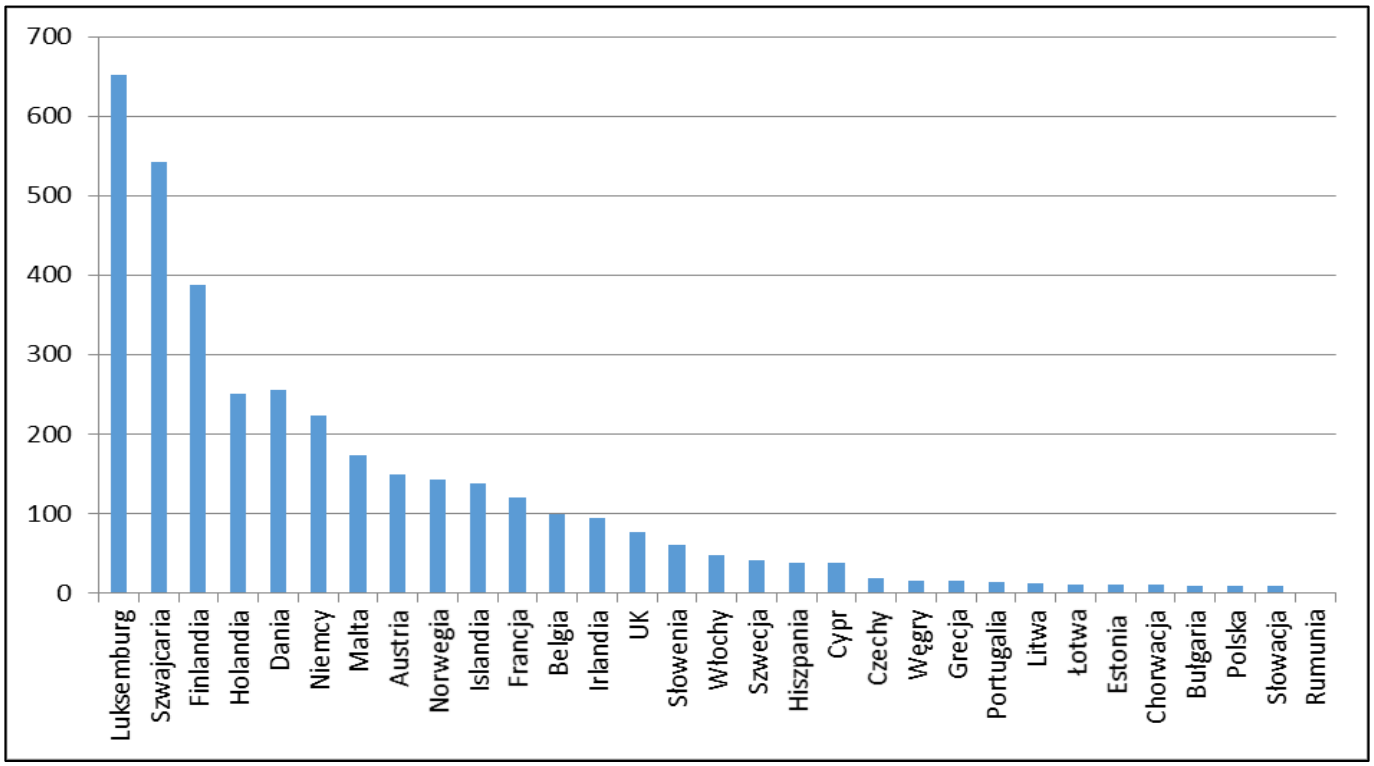
Figure 1. Patent applications and utility model applications filed by domestic entities under national and international procedure in the years 2012–2016.
Source: https://www.uprp.pl/uprp/_gAllery/87/18/87187/raport_roczny_2016.pdf

[7] *https://www.bankmillennium.pl/o-banku*
[8] *Cf. M. Bąk, Kulawczuk [ed.], Przedsiębiorczy uniwersytet. Praktyczna użyteczność badań naukowych i prac badawczo-rozwojowych. Projektowanie i prowadzenie badań naukowych we współpracy z gospodarką, Institute for Private Enterprise and Democracy, National Foundation of Culture of Entrepreneurship, Gdynia, Warsaw 2009, p. 40.c*
[9] *www.paih.gov.pl/files/?id_plik=19611 :4.1.12 Sektor badawczo-rozwojowy w Polsce. Sector profile*

Basic variables comprising performance indicators, in turn, involve selected effects of expenditures on R&D, such as number of scientific publications, patent submissions, obtained patents, and, most importantly, the number of innovative products.[10]

Another factor are the human capital metrics. Human capital is an important component of the innovative potential in Poland. Listed here are also metrics of human capital; average number of years of education in people between 25 and 64; the percentage of university graduates in the total population.[11]

The measurements above also indicate that Poland does poorly in relation to OECD countries[12].



Graph 2. Number of patents registered for every 1 million people.
Source: http://natemat.pl/100285,Polska-w-europejskim-ogonie-patentow-Jestesmy-na-szarym-koncu-kontynentu

Table 2. Population by education level in %.

SPECIFICATION	Total	higher	secondary and post secondary	basic vocational	lower secondary	primary completed
2002	100.0	11.1	32.4	23.8	1.8	28.0
2005	100.0	14.2	33.0	23.0	5.5	21.8
2010	100.0	19.3	33.6	21.9	5.3	18.0
2011	100.0	19.3	33.1	22.5	5.1	18.8
2012	100.0	20.7	32.9	22.1	5.0	18.2
2013	100.0	22.0	32.9	21.6	4.9	17.6
2014	100.0	23.2	32.7	21.2	4.8	17.1

Source:https://stat.gov.pl/files/gfx/portalinformacyjny/pl/defaultaktualnosci/5515/3/9/1/rocznik_demograficzny_2016.pdf

Among the innovation indicators also are the openness of the economy metrics. «Openness» is defined as weighted average of the export intensity and import penetration. In the economic growth equations included also is the degree of financial growth (value of loans granted by banks to private companies of private sector; market capitalisation; IMF financial liberalisation index).

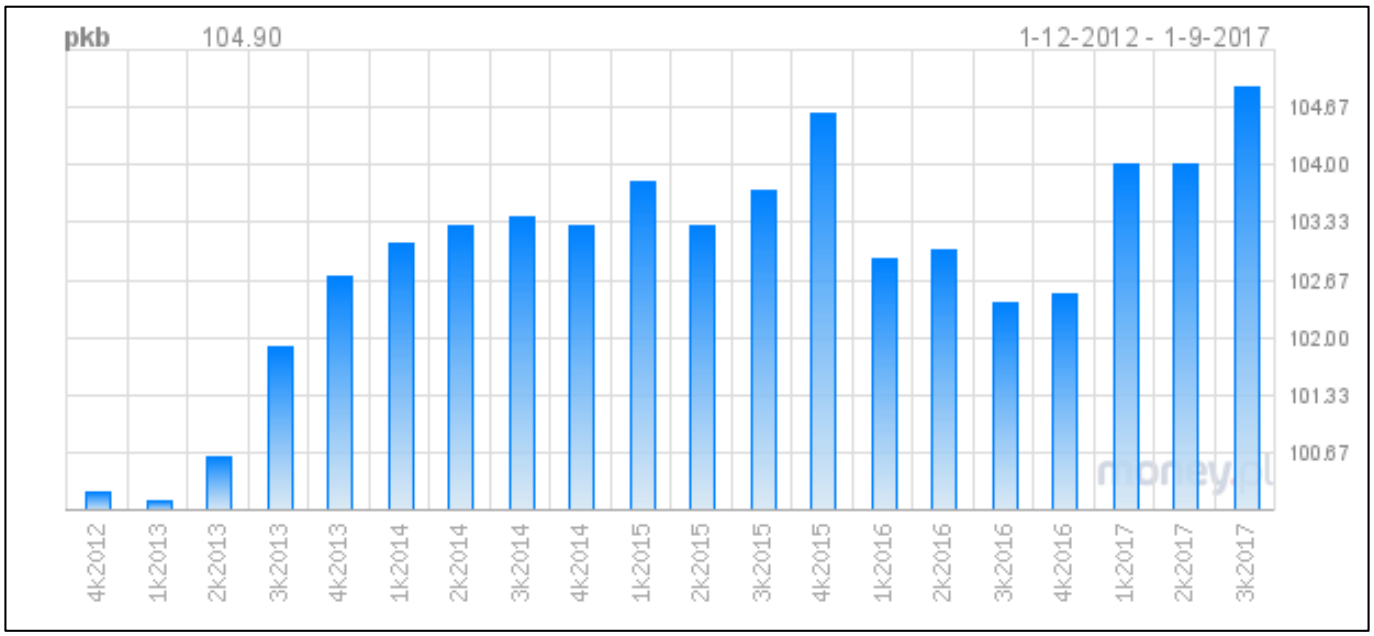
Other indicators are regulatory environment metrics (EPL employment protection legislation indexes and PMR product market regulation indexes and management quality indexes), as well as intellectual property protection indicator.

Currently, innovation in Europe is a basic element of the policy, which was highlighted in the Lisbon Strategy. The European council on 17 June 2010 approved the new long–term development strategy for EU, which replaced Lisbon Strategy implemented in years 2000–2010. The new strategy was adopted for years 2010–2020 and is named Strategy for smart and sustainable growth encouraging inclusion. The priorities presented in that document involve

[10] *https://www.uprp.pl/uprp/_gAllery/87/18/87187/raport_roczny_2016.pdf*
[11] *https://stat.gov.pl/files/gfx/portalinformacyjny/pl/defaultaktualnosci/5515/3/9/1/rocznik_demograficzny_2015.pdf*
[12] *http://natemat.pl/100285,Polska-w-europejskim-ogonie-patentow-Jestesmy-na-szarym-koncu-kontynentu*

the growth of an economy supported by knowledge; achieving sustainable growth, effective and careful use of natural resources; development of economy based on a high level of employment, providing social, economic and territorial cohesion. The aim of development is improving competitiveness and building innovative economy supported by knowledge. Entrepreneurship is mostly associated with innovativeness. Development of modern society, referred to as knowledge society would not be possible without the rapid evolution of modern information technologies, as described by Castells in his book «Network society».[13] Modern socio–economic development is based on improvement of qualifications, innovation, including technological innovation.The terminology concerning economic development and economic growth itself is defined differently.Economic growth is a «long–term process of changes occurring in the economy, measurable, i.a., by GDP, which also involves qualitative changes in the economy, e.g. structural changes of the economy.»[14] Economic growth, in turn, refers to the process of increasing the production of goods and services of a given economy measured by an adopted indicator GDP, NNP, GNI. [15]

Innovation policy adopted by EU is one of the economic policies. It encompasses, i.a., areas such as: strengthening relations in the national innovation system; shaping and improving the capabilities of introducing innovations in technology as well as in organisation and education; optimal implementation of innovations as a basic factor influencing economic growth and increasing employment; applying structural changes in techniques, technology and quality in industry; employing international cooperation and globalisation processes in the economy.[16]



Graph 3. Polish economy growth rate.
Source: https://www.money.pl/gospodarka/wiadomosci/artykul/pkb-polski-wzrost-gospodarczy-gus-trzeci,181,0,2392245.html

In accordance with EU guidelines, ensuring effectiveness of economic development requires cooperation with the research community and R&D businesses. In this case the flow of knowledge from universities into the economy is important.

This solution, as intended by EU, is meant to be a solution to global competition on the market. Commercialisation of knowledge must occur and then its transfer from the university to the economy.[17] In practice it means that scientific activity carried out by universities should respond to the needs of the market. In Poland 2050 Report it was assumed that universities are crucial for the future of Poland. It is because nowadays education is an investment in human capital. In Polish education such example of turning to human capital and New Public Management policy is the act of 27 July 2005 – Law on Higher Education. In the aforementioned act the primary goal of a university is to educate students in terms of acquisition and supplementation of knowledge and skills necessary for professional work.[18] The provisions say that the universities shall be institutions which provide employees for the economy.

Human capital is a part of intellectual capital. It is dependent on the relationship between the factors influencing it: social capital – relations allowing exchange of knowledge within a given society and market capital – relations with the external environment and structural capital.Currently, human capital is treated as one of the primary factors of growth and development of society and economy. The source of this concept is visible even in Adam Smith's reflections, who perceived work and skills as a form of capital, though did not explicitly name them as such. One of

[13] *M. Castells, Network society, PWN Scientific Publisher Warsaw 2008.*
[14] *J. Gardawski, L. Gilejko, J. Siewierski, R. Towalski, Socjologia gospodarki, Difin, Warsaw 2006, p. 57.*
[15] *Thereto.*
[16] *M. Strużycki, Innowacyjność w teorii i praktyce, Oficyna Wydawnicza, Warsaw 2006, p. 188.*
[17] *Cited after A. P. Wierzbicki, Szkolnictwo polskie w perspektywie 2050, [in:] PTE bulletin, Forum myśli strategicznej, no 2, 2012, p. 119.*
[18] *Act on Higher Education of 27 July 2005, Journal of Laws of 2005, No 164, item 1365, Article 13 paragraph 1*

the first economists, who used this expression was Irving Fisher.[19] However, this theory was revolutionised in the 1970s. Research carried out by i.a. Chicago School economists, Theodore Schultz, Gary Becker and Jacob Mincer emphasised the importance of human capital as one of the most important growth factors in modern economy. Follow up studies, which highlighted the importance of human capital were the studies of endogenous growth models carried out by i.a. Robert Lucas and Paul Romer starting from the 1980s.[20] To this day there is no common agreement concerning the definition of human capital. Globally, human capital comprises the size of population, socio–occupational categories, their physical state, and reproduction capability. It needs to be noted that human capital does not only depend on demographic resources of a given society. Currently it largely depends on the system forming the intellectual potential of the society.[21] However, individually, human capital is a structural element of human resources in the global sense. «It comprises a set of skills and predispositions of a person, properties of his/her social personality, views on life and career, beliefs and opinions, vocational knowledge, skills concerning the application of knowledge for problem solving, algorithms of creative activities and simulation skills, etc.[22] The shape of human capital is influenced by many factors. They are associated with, i.a., education, science and new technologies, factors associated with labour market and health. The notion of intellectual capital, in turn, is a narrower term. It encompasses knowledge, experience/possession of organisational technology, interactions with the clients, vocational skills, which provide a competitive edge on the market.[23]

Conclusions. Poland is currently before a challenge of changing the economy model from imitation to innovation. Poland belongs to the group of moderate innovators. Unfortunately, it is one of the least innovative countries in EU. Our country is characterised by an uneven innovative potential, which relies mostly on human resources and poor willingness to introduce innovation as well as cooperation in terms of research and development. Investments of Polish companies in innovation do not display a research and development character, but imitational, which involves adopting existing solutions. Also the investment activity within SMEs sector is poor. Poland is also not doing well in relation to EU countries in terms of creating own intellectual property. The main problem are patents rights. Poland fares relatively well in terms of sales and export of innovative goods. The factors improving the potential of the Polish society are access to modern forms of media and gradual growth of social mobility. The barriers, in turn, are: education system which lowers creativity and low social capital. A significant restriction is also the conservative approach, focused on survival, of Polish entrepreneurs towards the market and organisational structure. A chance for growth of the Polish economy is focusing on innovation, entrepreneurship and creative thinking. EU policy supports the sector of mall and medium companies in terms of innovations, which is a major chance for growth of Polish companies. Companies can use both national innovativeness support programmes, and the Regional Operational Programmes.

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ІННОВАЦІЙНА ДІЯЛЬНІСТЬ ЗА УМОВ КРИЗИ ТА ЇЇ ВПЛИВ НА КОНКУРЕНТОСПРОМОЖНІСТЬ ВІТЧИЗНЯНИХ ПІДПРИЄМСТВ

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Предметом дослідження є сукупність теоретичних, методичних та практичних аспектів формування інноваційної діяльності підприємств за умов кризи національної економіки.

Метою статті є обґрунтування особливостей формування інноваційної діяльності підприємств за умов кризи національної економіки та її впливу на конкурентоспроможність вітчизняних підприємств.

Дослідження ґрунтується на застосуванні діалектичного методу пізнання для вивчення закономірностей розвитку концепцій інноваційної діяльності підприємства (абстрактно-логічний метод, метод типології та класифікацій, метод аналогій). Крім цього, використано такі методи дослідження: теоретичного узагальнення і порівняння; системний аналіз; синтез; інформаційне моделювання; конкретизація; спостереження.

У статті визначена сутність інноваційної діяльності підприємства. Зазначено, що інноваційна діяльність – це процес, який починається з ідеї, що трансформується у об'єкти права інтелектуальної власності та завершується їх впровадженням у власне виробництво та/або комерційною реалізацією, при необхідності з післяпродажним супроводом. Побудовано алгоритм організації процесу прийняття та реалізації інноваційних рішень на підприємстві, що сприятиме підвищенню їх конкурентоспроможності. Обґрунтовано, що інноваційна діяльність може включати як всі етапи інноваційного процесу, так і бути його частиною, кожна з якої може завершуватися комерціалізацією її результату, на який поширюється право інтелектуальної власності, необхідність та доцільність комерціалізації якого визначається в залежності від можливостей підприємства та вимог ринку. Доведено, що економічна криза може бути як джерелом загроз, так і джерелом нових можливостей у розвитку економіки України. Криза також дозволяє використовувати шанс на проведення ефективної глобальної політики, щоб поліпшити стабільність фінансової системи і стимулювати економічне зростання. З метою активізації інноваційної діяльності в сфері вітчизняного підприємництва обґрунтована необхідність вироблення нової інноваційної політики, яка є сукупністю принципів і заходів, що забезпечують створення сприятливого інноваційного клімату в Україні, необхідного для успішного інвестування в українську економіку в умовах кризи. Реалізація такої політики також сприятиме підвищенню конкурентоспроможності вітчизняних підприємств.

Ключові слова: *інновації, інноваційна діяльність, криза, національна економіка, інноваційний потенціал підприємств, інноваційний розвиток підприємства, система управління інноваційним розвитком підприємства, конкурентоспроможність підприємств.*

