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Innovativeness of the Polish economy in relation to the Visegrad Group countries

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Abstract: In March 2017, the Warsaw Declaration was signed, establishing provisions for the strategic alliance of the Visegrad Group countries, in the framework of which innovativeness is to become a new element of the cooperation between its members. The Warsaw Declaration provides for the initiation of cooperation between governmental agencies, research institutions, universities and local governments in the V4 countries. Within the framework of the envisaged cooperation, Poland has the ambition to become the leader of innovativeness in the group. In the context of the Warsaw Declaration objectives concerning close cooperation in the field of enhancing the innovation potential of the Visegrad Group's economies, the assessment of the level of innovativeness of the Polish economy in relation to the other countries of the group is important. The aim of the paper is, therefore, to make a comparison of this potential on the basis of the summary innovation index, published in the annual report of the European Commission entitled European Innovation Scoreboard, as well as on the basis of the components of this index. In the article, there was conducted a literature review on the innovativeness of the Polish economy, a descriptive analysis, an analysis of statistical data in time and a comparative analysis. The authors proposed also the research thesis that the Polish economy shows a weaker innovation potential than those recorded for the other countries of the group. Results of the research confirm the thesis to some extent. Poland holds a dominant position only in a few areas describing the innovation potential and for most of the studied indices the Polish economy is located "in the tail" of the group.

Keywords: innovativeness, Visegrad Group (V4), summary innovation index (SII), European Innovation Scoreboard (EIS)

JEL codes: *C31, C34, C38*

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1. Introduction

In March 2017, the Warsaw Declaration was signed, establishing provisions for the strategic alliance of the Visegrad Group countries, within the framework of which innovativeness is

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expected to become a new element of the cooperation between its members. The Warsaw Declaration provides for the initiation of cooperation between governmental agencies, research institutions, universities and local governments in the V4 countries. Its objectives include, among others, support for innovative companies and start-ups as well as promoting competitiveness and digital transformation in the countries of the Visegrad Group. The signatory states undertake to promote in the international arena the countries of Central and Eastern Europe as a centre of research and innovation and to cooperate in areas of common interests, i.e. in the field of research, technology, innovation and digitization, in particular through the use of the EU funds. Within the framework of the envisaged cooperation, Poland has the ambition to become the leader of innovativeness in the group.

In the context of the Warsaw Declaration objectives concerning close cooperation in the field of enhancing the innovation potential of the Visegrad Group's economies, the assessment of the level of innovativeness of the Polish economy in relation to the other countries of the group is important. The aim of the paper is, therefore, to compare this potential on the basis of the Summary Innovation Index, published in the annual report of the European Commission entitled "European Innovation Scoreboard", as well as on the basis of the components of this index. In the article, there was conducted a literature review on the innovativeness of the Polish economy, a descriptive analysis, an analysis of statistical data in time and a comparative analysis. There was also proposed the research thesis that the Polish economy shows a weaker innovation potential than those recorded for the other countries of the group. Results of the research confirm the thesis to some extent: Poland indeed holds a dominant position but only in a few areas describing the innovation potential and for the most of studied indices the Polish economy is located "in the tail" of the group.

2. The assessment of the level of innovativeness of the Polish economy in relation to the Visegrad Group countries on the basis of the *European Innovation Scoreboard*

The measurement of innovativeness of economies is carried out on the basis of different methods and indicators. One of such methods is the European Innovation Scoreboard (EIS) developed by the European Commission. The European Innovation Scoreboard has been published since 2000 in the attempt to estimate the achievements of innovative European economies based on the

summary innovation index (SII). Summary innovation index values for the countries of the Visegrad Group in 2016 are presented in Table 1.

Table 1.Values of the summary innovation index for the Visegrad Group countries in 2016

Country	Summary Innovation Index – SII							SII in relation to SII EU28 (2016) (%)	SII in 2016 in relation to 2010
	2010	2011	2012	2013	2014	2015	2016		
EU 28	0.493	0.496	0.489	0.495	0.489	0.497	0.503		
Czech Republic	0.434	0.439	0.423	0.421	0.412	0.421	0.416	82.7	0.96
Poland	**0.261**	**0.263**	**0.251**	**0.254**	**0.251**	**0.257**	**0.270**	**53.7**	**1.03**
Slovakia	0.306	0.329	0.340	0.357	0.328	0.348	0.345	68.6	1.12
Hungary	0.350	0.349	0.325	0.326	0.329	0.332	0.332	66.1	0.95

Source: European Commission, 2017: annex F

The analysis of the data presented in Table 1 indicates that the level of innovativeness of the economies of the four countries concerned, measured by means of the summary innovation index (SII), is below the average for the EU28. The highest level of the index in 2016 was recorded in the Czech Republic and the lowest in Poland. The index increased in 2016 in relation to 2010 only in two countries of the Visegrad Group, i.e. in Poland by 3% and in Slovakia by 12%. For the Czech Republic and Hungary, the index decreased by approx. 5%.

On the basis of this index, the EU countries are divided into four groups: innovation leaders, innovation followers, moderate innovators, and modest innovators. It is worth noting that all the analysed countries belong to the group of moderate leaders – this group consists of 14 countries. The Czech Republic ranks first in this group, Slovakia ranks ninth, Hungary eleventh, and Poland thirteenth.

The analysis of variables that describe different areas of innovativeness forming the basis for the construction of the summary innovation index (SII) (Table 2) provides important information on the level of innovativeness of the Polish economy in relation to the economies of the other Visegrad Group countries.

Table 2. Innovativeness of the Polish economy in relation to the Visegrad Group countries in 2016

Innovativeness indices	EU28	Czech	Poland	Slovakia	Hungar	Leader-

		Republic			y	laggard
1. Human resources						
1.1. Graduates of doctoral studies per 1000 inhabitants aged 25-34 years	1.8	1.7 (94%)	0.6 (33%)	2.2 (55.6%)	1.0 (56%)	Slovakia – Poland
1.2. Share (%) of people with university education in the 25-34 age group	38.2	32.6 (85%)	43.9 (115%)	33.4 (87%)	30.4 (80%)	Poland – Hungary
1.3. Share (%) of people aged 25-64 years participating in continuing education	10.8	8.8 (82%)	3.7 (34%)	2.9 (27%)	6.3 (58%)	Czech Rep. – Slovakia
2. Research systems						
2.1. Publications in the framework of international research cooperation per 1 million inhabitants	494	688 (139%)	277 (56%)	408 (83%)	445 (90%)	Czech Rep. – Poland
2.2. Share (%) of scientific publications among the 10% most cited publications in the country's total number of publications	10.6	7.0 (66%)	5.0 (47%)	5.5 (52%)	6.2 (58%)	Czech Rep. – Poland
2.3. Share (%) of doctoral students from outside the EU in the total number of PhD students	25.6	14.8 (58%)	1.9 (7.4%)	9.1 (36%)	7.2 (28%)	Czech Rep. – Poland
3. Innovation-conducive to environment						
3.1. Share (%) of businesses with access to broadband Internet	13.0	10.0 (77%)	11.0 (84%)	9.0 (69%)	12.0 (92%)	Hungary – Slovakia
3.2. Motivational index*	3.1	2.7 (87%)	1.6 (52%)	1.4 (45%)	2.0 (65%)	Czech Rep. – Slovakia
4. Funding and support						
4.1. Share (%) of public expenditure on R&D in GDP	0.71	0.88 (124%)	0.54 (76%)	0.85 (120%)	0.35 (49%)	Czech Rep. – Hungary
4.2. Share (%) of venture capital investments in GDP	0.063	0.013 (21%)	0.029 (46%)	0.008 (13%)	0.055 (87%)	Hungary – Slovakia
5. Enterprises' investments						
5.1. Share (%) of expenditure on R&D in GDP in the sector of enterprises	1.30	1.06 (82%)	0.47 (36%)	0.33 (25%)	1.01 (78%)	Czech Rep. – Slovakia
5.2. Share (%) of expenditure on innovations unrelated to R&D in turnover	0.76	0.94 (124%)	1.24 (163%)	0.58 (76%)	0.75 (99%)	Poland – Slovakia
5.3. Share (%) of enterprises conducting training in the area of information and communication technologies	22.0	22.0 (100%)	12.0 (55%)	20.0 (91%)	16.0 (73%)	Czech Rep. – Poland
6. Relations						
6.1. Share (%) of SMEs cooperating in the area of innovations in the total number of SMEs	11.2	10.0 (89%)	3.5 (31%)	8.4 (75%)	6.2 (55%)	Czech Rep. – Poland
6.2. Scientific publications in the	28.7	10.2	3.7	10.0	23.2	Hungary –

framework of public-private partnerships per 1 million inhabitants		(36%)	(13%)	(35%)	(81%)	Poland
6.3. Share (%) in GDP of expenditure on R&D in the sector of government institutions and higher education institutions co-financed by the private sector	0.05	0.03 (60%)	0.02 (40%)	0.04 (80%)	0.03 (60%)	Slovakia – Poland
7. Intellectual assets						
7.1. Patent application submitted to the European Patent Office per 1 billion GDP	3.70	1.08 (29%)	0.58 (16%)	0.45 (12%)	1.32 (36%)	Hungary – Slovakia
7.2. The EU trade marks per 1 billion GDP (Euro PPP)	7.60	5.14 (68%)	5.25 (69%)	4.30 (56%)	3.91 (51%)	Poland – Hungary
7.3. The EU industrial designs per 1 billion GDP (Euro PPP)	4.33	2.62 (61%)	5.90 (136%)	1.06 (24%)	0.93 (21%)	Poland – Hungary
8. Innovators						
8.1. Share (%) of SMEs introducing product and process innovations in the total number of SMEs	30.9	30.8 (99.6%)	13.3 (43%)	16.7 (54%)	15.1 (49%)	Czech Rep. – Poland
8.2. Share (%) of SMEs introducing organisational and marketing innovations in the total number of SMEs	34.9	25.7 (74%)	11.4 (33%)	22.4 (64%)	15.2 (44%)	Czech Rep. – Poland
8.3. Share (%) of SMEs introducing internal innovations in the total number of SMEs	28.8	28.0 (97%)	8.3 (29%)	13.9 (48%)	11.7 (41%)	Czech Rep. – Poland
9. Impact of employment						
9.1. Employment in knowledge-intensive sectors as a share (%) of the total number of employed people	14.1	12.8 (91%)	10.0 (71%)	10.0 (71%)	12.2 (87%)	Czech Rep. – Poland/ **Slovakia**
9.2. Employment in fast-growing innovative sectors as a share (%) of the total number of employed people	4.8	5.0 (104%)	5.5 (115%)	7.4 (154%)	7.6 (158%)	Hungary – Poland
10. Economic effects						
10.1. Exports of medium-high and high-technology products as a share (%) of total exports	56.2	64.1 (114%)	49.4 (88%)	66.5 (118%)	69.6 (124%)	Hungary – Poland
10.2. Exports of knowledge-intensive services as a share (%) of total service exports	69.3	42.0 (61%)	39.6 (57%)	34.8 (50%)	47.3 (68%)	Hungary – Slovakia
10.3. Sales of products new and significantly improved for the market and for the company as a share (%) of total turnover	13.37	14.57 (109%)	6.45 (48%)	19.11 (143%)	12.47 (93%)	Slovakia – Poland

The percentage share of a given variable in relation to the EU28 average is given in brackets.

*Motivational index is calculated as the ratio of persons involved in entrepreneurial activities because of a desire to improve their financial situation to persons involved in such activities because of a lack of other options.
Source: European Commission, 2017: annex C, D

On the basis of the analysis of the data contained in Table 2, it can be concluded that among 26 components of the summary innovation index Poland holds a dominant position in this group of countries only in terms of 4 of these components. These variables include: the number of university graduates, expenditure on innovations unrelated to R&D activities, as well as the EU trade marks and industrial designs. In terms of the number of university graduates, Poland records a higher level of this index in relation to the EU28 average (15%), expenditure on innovations unrelated to R&D activities is at the level 63% higher than the EU28 average, the number of the EU trade marks constitutes 70% of the EU28 average, and the number of the EU industrial designs is 31% higher than the EU28 average. It is worth noting that in terms of employment in fast-growing innovative sectors Poland also exceeds the EU28 average by 15%.

With regard to 14 SII components (out of 26 analysed ones), Poland ranks last among the studied countries. These indicators show values below the 28 EU average. Among them, relatively high values in relation to the EU average are recorded for exports of medium-high and high-technology products as a percentage of the total exports (88%) and the number of enterprises with broadband access (84%). The level of approx. 70% of the EU 28 average was recorded for: the share of public expenditure on R&D in GDP (76%), employment in knowledge-intensive sectors as a share in the total number of employed people (71%) and the number of the EU industrial designs (69%). The following SII components are at the level slightly higher than half of the 28 EU average: exports of knowledge-intensive services as a share of the total service exports (57% of the EU28 average), publications in the framework of international research cooperation per 1 million inhabitants (56%), the share of enterprises conducting training in the area of information and communication technologies (55%), and the motivational index (52%). The remaining components are at the level lower than the EU average: the number of patent applications submitted to the European Patent Office (16% of the EU28 average), the number of scientific publications in the framework of public-private partnerships (13% of the EU28 average), and the number of doctoral students from outside the EU (7% of the EU28 average).

Among the remaining Visegrad Group countries, in terms of 13 components of the summary innovation index, the Czech Republic holds the dominant position, while Hungary is the leader in the areas of 7 components and Slovakia in 3.

The Czech Republic holds a dominant position in the region in terms of the following variables: publications in the framework of international research cooperation (139% of the EU28 average), public R&D expenditure (124%), the number of enterprises conducting training in the area of information and communication technologies (100%), the number of SMEs introducing production and process innovations (99.6%), the number of SMEs introducing internal innovations (97%), employment in knowledge-intensive sectors (91%), the number of SMEs cooperating in the area of innovations in the total number of SMEs (89%), the level of motivational index (87%), the number of persons participating in continuing education (82%), enterprises' expenditure on R&D (82%), the number of SMEs introducing organisational and marketing innovations (74%), scientific publications among the 10% most cited publications in the country's total number of publications (66%), and the number of doctoral students from outside the EU (58%). It is worth noting that the Czech Republic also records the levels of the following SII components which are significantly higher than the EU28 average: expenditure on innovations unrelated to R&D activities (124%), exports of medium-high and high-technology products (114%), sales of products new and significantly improved for the market and for the company (109%), and employment in fast-growing innovative sectors (104%).

Hungary is the leader in the analysed group in terms of: employment in fast-growing innovative sectors (158% of the EU28 average), exports of medium-high and high-technology products (124%), the number of businesses with access to broadband Internet (92%), venture capital investments (87%), the number of scientific publications in the framework of public-private partnerships (81%), exports of knowledge-intensive services (68%), and patent applications submitted to the European Patent Office (36%).

Slovakia is the leader in terms of the following components of the summary innovation index: sales of products new and significantly improved for the market and for the company (143% of the EU28 average), the share of expenditure on R&D in the sector of government institutions and higher education institutions co-financed by the private sector in GDP (80%), and the number of new doctoral students (55.6%).

Current reflections on innovativeness indices for the countries of the Visegrad Group help to formulate a few conclusions relating to the assessment of the innovation potential of Poland's economy in relation to the other countries of the group.

Firstly, it should be noted that Poland is characterised by a relatively low share of medium-high and high-technology exports in its total exports (i.e. 88% of the EU28 average in 2016 based on the European Innovation Scoreboard; however, the level of this variable is high compared to the other SII components for Poland). The Czech Republic and Hungary have higher shares of this type of exports. The Polish economy is even worse off in terms of the share of high technology exports in the GDP, as in 2015 this share amounted to 8.5%, while in the case of the Czech Republic it amounted to 15.4%, for Hungary it was 15.2% and 9.8% for Slovakia (Polski Fundusz Rozwoju, 2017). It should be noted that indicators describing exports of advanced technologies are a synthetic picture of the economy's capacity to produce competitive products for the global market. However, this ability often stems from high innovativeness of companies with foreign capital, which have moved production facilities but left research and development centres in the countries from which their capital originated (Geodecki et al., 2013: 27). This is the situation which has occurred in Poland. Thanks to foreign capital, new industries – Poland's specialties – have been created: car, consumer electronics and household appliances assembly plants as well as car and aircraft components production plants (Gromada et al., 2015: 27). However, in the international value-added chain, they are one stage of production located between the concept-research phase and marketing&sales, which means a low return of Polish export expenditure. This situation means that there is a threat of continued dependence of economic growth on foreign capital which shows more interest in the maintenance of the low labour costs than in investments in innovation (Geodecki et al., 2013: 28).

Secondly, it is significant that indicators concerning the education system in Poland are favourable. According to the European Innovation Scoreboard, in 2016 Poland recorded the highest percentage of people with higher education among the countries of the Visegrad Group. However, it needs to be emphasised that this indicates only a high degree of formal education, and not the actual quality of teaching, which is clearly seen in the level of innovativeness of the Polish economy. The Polish education system is not conducive to the promotion of creativity and collaboration skills, it does not teach principles of communicating and acceptance of failure, or

encourage the building of social capital understood as a set of informal values and ethical standards common to members of a particular community enabling them to cooperate effectively.

Thirdly, a lack of permanent ties between the sphere of scientific research and the business sphere indicates an insufficient level of social capital development. In Poland, there is, in fact, still a lack of an effective system of cooperation between these spheres. There exists in this area a kind of "vicious circle" of impossibility. On the one hand, entrepreneurs complain that innovative projects offered by R&D institutions do not correspond to their needs and show a passive approach to the commercialisation of research results. On the other hand, representatives of the R&D sphere institutions believe that enterprises are not particularly interested in utilising research results, as their strategy is mainly focused on the exploitation of simple reserves of workforce productivity growth. In fact, many companies use basic competitive advantages resulting from low costs of production, and not from the continuous raising of the quality of products, the power of the created brand or capital-intensive investments in the development of technologies. In turn, companies that are interested in innovations often focus not so much on finding their own solutions but on the much simpler purchase of technologies or licences from the outside.

Fourthly, when there is a lack of incentives for the cooperation between the sphere of scientific research and the business sphere, it should come as no surprise that enterprises' expenditure on R&D activity in Poland is only 36% of the EU28 average (only Slovakia shows a lower level among the countries of the Visegrad Group), while Poland's level of expenditure on innovations unrelated to R&D activity exceeds the EU28 average by more than 63%. It should be also said that the level of government's expenditure on R&D activity in Poland is the lowest among the EU and OECD countries. It is also lower than the average for the Visegrad Group countries. The share of this type of expenditure in Poland is at the level of 1% GDP, in Slovakia – 1.14% GDP, in Hungary – 1.35% GDP, and in the Czech Republic – 1.95% GDP (Polski Fundusz Rozwoju, 2017: 15). It should also be noted that an increase in public expenditure on R&D activity is not something that could significantly affect the growth of innovativeness of the economy. This expenditure is determined by political decisions, and not, as in the case of inputs from the private sector, by market forces. Thus, in the present situation, efforts should be made to increase expenditure on research and development incurred by enterprises rather than the state.

Fifthly, in the EIS, the index for patent applications to the European Patent Office for Poland is only 16% of the EU28 average. Among the countries of the Visegrad Group, only Slovakia records a lower level of this index. The research results indicate that there is a positive relationship between patent activity and the level of the country's development – highly developed countries have a tradition of invention culture (e.g.: Germany, English-speaking countries, East Asian countries) and patent activity is widespread, while countries with a lower level of development lack appropriate, well-established tradition/institutions in this regard and patent activity is weak (Orłowski 2013:, 13). Poland, due to its low level of R&D investment, especially expenditure financed by the private sector, and poorly developed cooperation between higher education institutions and enterprises is doomed to belong to the latter group of countries.

Sixthly, the lowest number of scientific publications created in Poland in the framework of public-private partnerships and the lowest among the countries of the Visegrad Group percentage of doctoral students from outside the EU also stem from the analysed indices. The reasons for this situation can be found in deficiencies of social capital, manifested, among others, in the inability to perform joint tasks, a lack of trust and social unwillingness to participate in joint public-private ventures, as well as a small degree of openness to cooperation with foreign countries (Hausner, 2013: 37).

The analysis of the presented indices describing the level of innovativeness of the Visegrad Group countries' economies allows formulating the conclusion that Poland holds a dominant position only in a few areas describing the innovation potential. It can be said that for the majority of studied indices the Polish economy shows a weaker innovative potential than those recorded for the other countries of the group. Thus, in the context of Poland's desire to aspire to the role of the leader in the area of innovativeness among the economies of the Visegrad Group countries, it is necessary to increase its innovation potential.

3. Directions in increasing the level of innovativeness of the Polish economy

In The Global Innovation Index 2017 report, Poland occupies the last position among the countries of the Visegrad Group and ranks 39th in the total ranking (Dutta et al., 2017). In the European Innovation Scoreboard, Poland is in the group of moderate innovators as other countries in the group, but ranks last among them. Thus, the conducted analysis leads to the conclusion that the effects of the innovation policy to date have been poor. It is therefore

necessary to make efforts to reconstruct the existing model of promoting the development of innovation in Poland. The success of this project depends on many different factors related not only to the sphere of economic policy, but to social and cultural determinants as well.

Firstly, the formulation of a long-term strategy for the socio-economic development is important for enhancing the level of innovativeness of the Polish economy. The current strategy of the country's development, based on the use of knowledge and innovations as the main driving force of this process, is fraught with many problems. The main weakness of this strategy is the predominance of short-term thinking about the economy over long-term thinking, i.e. setting long-term development goals.

Secondly, fostering a stable macroeconomic environment, which provides a background for the implementation of modernisation programmes, is a key prerequisite for raising the level of innovativeness of the economy. In this context, the state of public finances is of particular importance, as it determines the government's participation in pro-innovative activities, in particular in the areas, such as education, R&D activity, provision of support for innovative enterprises (especially small and medium-sized), as well as transport or energy infrastructure (Ministerstwo Gospodarki, 2011: 54).

Thirdly, the development of innovativeness requires a well-functioning institutional system. Skilled human capital and high expenditure on R&D are important factors stimulating innovative processes, but they do not guarantee automatically the effective use (commercialisation) of new technologies or the acceleration of the GDP growth per capita (Płowiec, 2010: 657). It is therefore necessary to introduce the appropriate institutional system that affects the degree of use of the economy's technological potential. Empirical studies confirm the existence of a positive, statistically significant, correlation between the degree of development of the economies and the efficiency of the state's activities in the field of shaping the institutional system (the research covered the OECD countries in the years 2001-2005) (Balcerzak, 2009: 231-241). Widely understood conditions for the pursuit of economic activities facilitating the development of entrepreneurship and innovativeness are an important element of the institutional environment. This means, among others, the need to simplify lengthy administrative and judicial procedures.

Fourthly, creating an effective system supporting innovations requires increased and appropriate allocation of financial resources for R&D and deployment activities originating from

the state budget and enterprises' own funds. Changes in this area should primarily constitute in increasing enterprises' expenditure on R&D by facilitating access to capital in all the phases of implementation of R&D projects. The state funding for R&D should also increase provided, however, that enterprises' own expenditure in this area grows even more rapidly (Okoń-Horodyńska, 2004: 33).

The development of the high-risk capital market (private equity, venture capital) is of key importance for financing innovative enterprises. The existing commitment of private equity or venture capital funds in the financing of this type of activity in Poland is insufficient – in 2015, venture capital investments in relation to the GDP amounted to 0.029%, while the EU28 average amounted to a 0.63% (European Commisssion, 2016). The development of the system of public-private partnerships in the field of funding strategic technologies creates opportunities to overcome the capital barrier which currently discourages, especially small and medium-sized enterprises, from undertaking innovative projects.

Fifthly, for a significant increase in the level of innovativeness of the economy, it is necessary to develop permanent links between the R&D sphere and the business sphere. The Small Innovativeness Act (Act of November 4, 2016 on the Amendment of Certain Laws Setting Out Conditions for Conducting Innovative Activities), providing the possibility of elimination of income tax on intellectual property, contributed to an enterprise or deduction of patent costs from the tax, as well as the amendment to the Law on Higher Education may become a remedy for this situation.

Sixthly, an important pillar of the strategy for raising innovativeness is the education system which places emphasis on developing creativity and the ability to cooperate and communicate, on lifelong learning with a wide offer of supplementing knowledge or even changing one's profession, and on increasing flexibility in developing programmes of study and their internationalisation. The growth of social capital is essential for the efficient use of human capital. Indicators characterising this capital in Poland are now among the lowest in the European Union. According to the research conducted within the framework of “Social Diagnosis 2015” (Czapiński, Panek, 2015), only 15% of Poles trust other people compared to the 32% average level of trust in the European Union.

4. Conclusions

Summing up the reflections on the level of innovativeness of the Polish economy, it should be stressed that there is no universal recipe for a strategy of raising the level of innovativeness which would work with the same efficiency in any economy. In search of a strategy for Poland, one can refer to the experiences of countries which over the last quarter of the century have progressed to the group of the most innovative economies in the world. Taking into account the real capacity of the Polish economy at the present stage of its development, it can be assumed that in the near future Poland should pursue a strategy based on the specific version of the imitation model, focused primarily on direct foreign investment. A prerequisite for the effectiveness of this solution, however, is the introduction of regulations that will force foreign companies to base in Poland, in addition to the production cycle, also elements of the value chain related to R&D activities. It should also be noted that transfer of new technologies through direct investments imposes certain obligations on the country which receives such investments. Therefore, it is necessary for the said country to have its own R&D facilities and highly qualified employees as well as financing for the development of imported technologies. It should be noted, however, that the imitation strategy may exhaust its possibilities. Over time, access to technologies known in the world can become limited, therefore in the long-term perspective Polish economy should selectively, i.e. in selected fields of science and technology in which Poland represents the highest world level, progress from the group of "peripheral technologies" economies to the group of leaders in technology (Fiedor, 2009: 281). The project of cooperation in the framework of the Visegrad Group, proposed in the Warsaw Declaration, which is aimed at raising the innovation potential of each group member provides an opportunity for such a change.

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Innowacyjność polskiej gospodarki na tle krajów Grupy Wyszehradzkiej

Streszczenie

W marcu 2017 r. została podpisana Deklaracja Warszawska, zakładająca strategiczny sojusz państw Grupy Wyszehradzkiej, w ramach którego innowacyjność ma stać się nowym elementem współpracy między państwami grupy. Deklaracja Warszawska przewiduje zainicjowanie współpracy między agendami rządowymi, instytucjami badawczymi, ośrodkami uniwersyteckimi i samorządami w krajach V4. W kontekście założeń Deklaracji Warszawskiej dotyczących bliskiej współpracy w zakresie zwiększania potencjału innowacyjnego gospodarek Grupy Wyszehradzkiej istotna jest ocena poziomu innowacyjności polskiej gospodarki w odniesieniu do pozostałych krajów grupy. Celem artykułu jest zatem porównanie owego potencjału na podstawie sumarycznego wskaźnika innowacji (Summary Innovation Index), publikowanego w corocznym raporcie Komisji Europejskiej, zatytułowanym European Innovation Scoreboard, jak również w oparciu o składowe tego wskaźnika. W artykule zastosowano następujące metody badawcze: przegląd literatury na temat kwestii związanych z innowacyjnością polskiej gospodarki, analizę opisową, analizę danych statystycznych w czasie i analizę porównawczą. Sformułowano tezę badawczą, że polska gospodarka wykazuje słabszy potencjał badawczy od pozostałych krajów omawianej grupy. Wyniki badania potwierdzają tę tezę do pewnego stopnia. Polska zajmuje dominującą pozycję wśród krajów grupy jedynie w kilku obszarach opisujących potencjał badawczy, natomiast w odniesieniu do większości wskaźników zajmuje niskie pozycje.

***Słowa kluczowe*:** innowacyjność, Grupa Wyszehradzka, sumaryczny wskaźnik innowacyjności (SII), Europejska Tablica Wyników w zakresie Innowacyjności (EIS)