

Social Capital and Innovation in the Countries of the Visegrad Group

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Abstract: The aim of the article is to assess social capital and its components in the V4 countries and to indicate their importance for innovativeness. The authors used the statistical data of the V4 and four innovation leaders. A comparative analysis was based on ESS data, Eurostat. The results of social capital reports were cited. The results show the influence of social capital and trust on innovation, while the authors' analysis indicates a large deficit of them in the V4. Their level over the last years has not improved significantly, which may be the reason for the still low innovativeness of the V4, despite an increase of R&D expenditure. It is not only financial resources that are a brake on the growth of innovation in the V4, that there is still some barrier of progress and it could be low social capital, without which effective use of financial resources is impossible. It is an important stage in the search for innovativeness generators. It is necessary to study the interaction of variables, check whether soft determinants have an impact on innovativeness. The subject requires more in-depth analyzes, as it may turn out that strategies will not be effective without building social capital.

Keywords: social capital; innovativeness; trust; Visegrad Group; V4

JEL Classification: O1; O18; O31; R11

1. Introduction

The evolution of economies has recently considerably accelerated, Europe is struggling with many problems that it must face (aging of the population, competition on the global market, financial crises etc.). The driving force behind further development, as stated in the EC report (2012, p. 2), are innovations that are "(...) the best means to put the European economy on the right track and solve social issues in the global economy".

In the Ministry of Economy's document it was stressed that the innovativeness of economic entities creates innovativeness of the economy, contributing to the competitiveness of the economy, which in turn translates into gross domestic product (GDP) growth.

The aim of the article is to assess social capital through the prism of its components in the countries of the Visegrad Group and to indicate the importance of these factors in building and implementing innovation in the V4 countries. Based on the literature of the subject, the article presents relationships between these categories. The assessment of individual V4 countries was made in terms of the social capital resources and development opportunities in the future innovativeness. To this end, the authors used the statistical data of the V4 countries and the statistical data of 4 innovation leaders, i.e. Sweden, Germany,

Denmark, Finland. A comparative analysis was used based on e.g. European Social Survey data, Eurostat statistics. The results of analyzes from reports examining the dependence of innovation on social capital and its components were also cited.

Innovativeness in the literature of the subject is determined by the prism of variously understood novelties, and its boundaries are quite fluid. The term etymology is to be found in the Latin word *innovatio*, meaning renewal or in another Latin word meaning novelty, i.e. *novus*. It is assumed that the concept of innovation was introduced into the literature by Schumpeter (1934), recognizing that the entrepreneur in the search for profit implements innovations by using different, new combinations of factors of production, which changes their current state. Today's understanding of innovation is more liberal than Schumpeter's, because it allows diffusion from other entities. In Eurostat's and OECD's papers an innovation is a new or improved product or process (or combination thereof) that differs significantly from the unit's previous products or process and that Has been made available to potential users (product) or brought into use by the unit (process).

A wider perspective on innovation and innovativeness allows interpreting it as a social and economic activity, leading to new use of resources, formulating new ideas, new ways of acting and introducing changes, understood as replacing the current state of affairs with others (Gomułka, 1998). Both Drucker (1985) and Schumpeter (1934) were looking for sources of innovation in entrepreneurs' activities. Drucker saw innovations above all as a social and economic phenomenon, not just technological processes.

Similarly, innovativeness as a category located in some space that shapes conditions is perceived in the concept of an innovative environment (*innovative milieu*), introduced by Aydalot (1986). He sees the source of innovation not in the enterprise, but in the environment in which it operates. According to this concept, the entity is innovative when it interacts with the environment, uses local conditions, which in subsequent stages, based on the specificity of a given environment, will decide on a competitive advantage. All this allows you to effectively use knowledge and information to create new products or new production processes. The model of an innovative environment strongly emphasizes the importance of interaction between business entities, such as mutual learning and a joint search for a solution. Cooperation takes place in a specific geographical space, creating a specific network.

The definitions cited above largely associate innovations with inventions, and hence innovativeness - with technical progress. A contemporary look at innovations extends a bit of a look at innovations and its sources from only its hard aspects, including those soft. The authors of "The Innovative potential ..." report (2016) define innovations through the prism of not only technological improvements, e.g. new products or production techniques, but also in the social dimension. This entails a strong emphasis on the role of social capital in shaping the conditions for innovative activity.

Social capital also falls into the category of ambiguous definitions, because depending on the purpose of the research, its framework is constructed differently, which leads to the blurring of the concept and the application of arbitrarily selected indicators, but the common denominator of all descriptions remains: trust, cooperation and civic activity. Contemporary researchers describing social capital also refer to the category of trust and cooperation within

the community, thanks to which the effectiveness of other growth factors is higher (Będzik, 2015).

The level of general interpersonal trust has a definitely positive effect on economic growth. This is indicated by the results of numerous empirical studies. For example, Knack and Keefer (1997), in a study covering 29 countries, documents the significant positive impact of overall people-to-people trust on Gross Domestic Product (GDP) per capita growth. Similar results were obtained by Akçomak and ter Weel (2009), in a study covering 102 regions in 14 European countries, and Forte et al. (2015) in a study covering 85 regions in 21 European countries.

2. Methodology

Social capital and trust belong to the category of soft factors that are difficult to measure and have been noticed relatively recently, which results in the lack of comparative statistical data. EUROSTAT and European Social Survey (ESS) databases were used to trace the different categories (social capital, trust, innovativeness) in different countries over the course of several years. Thanks to this, different countries can be compared in different years, as the methodology of obtaining data was the same for all countries. The authors made a comparative analysis using secondary data, but thanks to this they ensured the comparability of the analyzed categories.

The source of data describing the innovative capacity selected for the analysis of countries are The Global Competitiveness Reports (GCR), published by World Economic Forum (WEF), from the years 2006-2015. The reports present an assessment of the ability of economies to achieve long-term economic growth based on indicators divided into 12 pillars of competitiveness, while the data from the innovativeness pillar were used for the purposes of the article.

Data on the relationship between social capital and trust and innovation and its individual aspects are presented as correlation coefficients. The values of the t-statistics were also presented. Innovativeness was measured by the summary Innovation Union Scoreboard (IUS), "productivity" was related to the logarithm of labor productivity, measured as GDP per employee. The calculations were taken from the report of the National Bank of Poland. Information on electoral participation, volunteering and the various dimensions of trust came from Eurostat data. Aggregated data on the quality of life, included in OECD reports prepared separately for each country, were also used. A very important source of data used in this publication were the results of surveys from several editions of the European Social Survey (ESS).

3. Results

3.1. The Relationship between Social Capital and Innovativeness

In the National Bank of Poland (NBP) report entitled "The innovative potential of the economy: conditions, determinants, perspectives" the results of comparison of social capital with the level of innovativeness of European countries were presented. The most attention

was paid to the dependence of innovation on the level of social trust for two reasons. First of all, because the literature of the subject assigns to this element of social capital the highest importance in building innovation. Secondly, social capital and its components are relatively difficult to measure, so the availability of data is very limited. However, with regard to social trust, comparability and data availability are satisfactory due to data obtained from the ESS, where social trust is measured systematically, in a uniform manner, for all countries studied and in all waves of the survey. The report also included data from Eurostat and IUS. In the cross-section of EU countries, the average level of social trust is strongly positively correlated with IUS. The societies of the Scandinavian countries ie. Denmark, Sweden, Finland as well as Switzerland, are both the most innovative and the most trusting. On the opposite pole there are countries of Central and Eastern Europe (especially Bulgaria, but also Slovakia and Poland) and Portugal.

A strong positive correlation between social trust and the innovativeness rate is also maintained taking into account country-specific effects that control the level of work productivity or the use of social trust measures delayed by 2 years. It can therefore be concluded that despite relatively better results in terms of productivity and wealth in countries that are at the same time leaders of innovativeness and trust, the data also shows a direct relationship, independent of labor productivity, between social trust and innovativeness. In addition, the discussed effects also appear in the time dimension: within individual countries, the increase in social trust brings about a statistically significant increase in innovativeness (Table 1). Among the most important channels through which social trust favors innovativeness, one can mention the channel of financing and support for innovativeness, investment of companies in R&D, links between companies and support for entrepreneurship.

Table 1. Impact of social trust on innovativeness. Source: own study based on: The innovative potential of the economy: conditions, determinants, perspectives, NBP, Warsaw 2016, p. 276.

Type	1	2	3	4
Method	OLS	RE	OLS	RE
Efficiency _t	<i>0.292 [5.669]</i>	<i>0.237 [5.242]</i>		
Trust _t	<i>0.0515 [3.192]</i>	<i>0.0341 [2.483]</i>		
Efficiency _{t-2}			<i>0.266 [6.101]</i>	<i>0.163 [4.979]</i>
Trust _{t-2}			<i>0.0546 [3.865]</i>	<i>0.0439 [3.503]</i>
Constant	<i>-2.933 [-5.730]</i>	<i>-2.260 [-4.698]</i>	<i>-2.655 [-6.157]</i>	<i>-1.491 [-4.229]</i>
Number of observations	71	71	92	92
Number of countries		26		27
Corrected R-square	0.618	0.627	0.613	0.620
Intra-group R-square		0.196		0.177

¹Note: Innovativeness is measured by a innovation union scoreboard, efficiency concerns the work productivity logarithm, measured as GDP per employee. The values of the statistics t are given in brackets. The italic text in the table means statistically significant variables at a minimum level of 5%.

In turn, Table 2 presents estimates of models that take into account country-specific random effects and trust delayed by 2 years. The results indicate that the level of trust exerts a statistically significant, positive influence on the partial indices of the IUS innovation index related to financing and innovation support (F+S), investments of companies in R&D and corporate connections and entrepreneurship (L+E). Poor positive dependence is characteristic

for innovation indicators in small and medium enterprises (I) and economic effects of innovativeness (EE). The remaining three dimensions of the IUS innovativeness index i.e. dimension of the research systems (RS), human resources (HR) and intellectual assets (IA), do not show dependence from the level of social trust.

Table 2. Impact of trust and frequency of social contacts on innovativeness and its various aspects.

Source: own study based on: The innovative potential of the economy: conditions, determinants, perspectives, NBP, Warsaw 2016, p. 277.

	IUS	HR	RS	F+S	R+D	L+E	IA	I	EE
Method	RE	RE	RE	RE	RE	RE	RE	RE	RE
Efficiency _{t-2}	0.161 [4.60]	0.306 [4.86]	0.561 [7.91]	0.172 [2.06]	-0.122 [-1.39]	0.096 [1.08]	0.367 [5.09]	0.033 [-0.37]	0.156 [3.29]
Trust _{t-2}	0.043 [3.43]	0.017 [0.74]	0.042 [1.62]	0.104 [3.46]	0.111 [3.49]	0.080 [2.48]	0.042 [1.60]	0.057 [1.79]	0.029 [1.65]
Social contacts _{t-2}	-0.001 [-0.05]	-0.102 [-3.27]	0.055 [1.56]	0.027 [0.64]	0.005 [0.12]	0.063 [1.41]	-0.019 [-0.54]	0.097 [2.19]	0.010 [0.41]
Constant	-1.458 [-3.54]	-2.337 [-3.39]	-6.129 [-7.99]	-1.996 [-2.25]	1.171 [1.23]	-1.247 [-1.28]	-3.585 [-4.42]	0.114 [0.12]	-1.397 [-2.55]
Number of observations	92	92	92	92	92	92	92	92	92
Number of countries	27	27	27	27	27	27	27	27	27
Corrected R-square	0.619	0.239	0.752	0.543	0.119	0.454	0.389	0.120	0.391
Intra-group R-square	0.178	0.427	0.261	0.018	0.130	0.008	0.254	0.112	0.057

IUS – Innovation Union Scoreboard; F+S - Finance and Support; R+D - Firm Investments; L+E - Linkages and Entrepreneurship; I - Innovators; EE - Economic effects; RS - Research systems; HR - Human resources; IA - Intellectual assets;

In the above-mentioned studies, social capital revealed by the frequency of social contacts did not show any correlation with the level of innovativeness. The indicator of the average frequency of social contacts according to the ESS data (the question concerned social meetings with friends, relatives or work colleagues) is in the statistical sense uncorrelated with both the summary IUS innovativeness index and its components. The only exception is the human resources index, which is negatively correlated with the frequency of social contacts, as well as the innovation rate of small and medium enterprises, showing moderately positive correlation.

3.2. Results of Innovation and Social Capital in the Countries of the Visegrad Group

All innovativeness rankings place the V4 countries in the group of countries with low rates. In the reports published by the European Commission (EC), the V4 countries are in the group referred to as moderate innovators. For the 28 countries presented in the European Innovation Scoreboard in 2016, Poland took 6th place from the end. It only overtook Romania, Bulgaria, Hungary, Lithuania and Latvia. Slovakia and the Czech Republic were ahead of Poland. Sweden, Denmark and Finland are in the lead. On the other hand, the ranking of innovation in the world is opened by countries such as United States of America, Japan and South Korea.

The conclusions drawn in recent years from reports on innovations change their pronunciation a bit, accentuating the role of soft factors more and more (OECD, 2009). The

importance of the so-called open innovation, innovation based on cooperation between companies (in the form of contracts, joint ventures, outsourcing), eco-innovation, human capital and innovation in the public sector, e.g. in health service, public administration, education, increases.

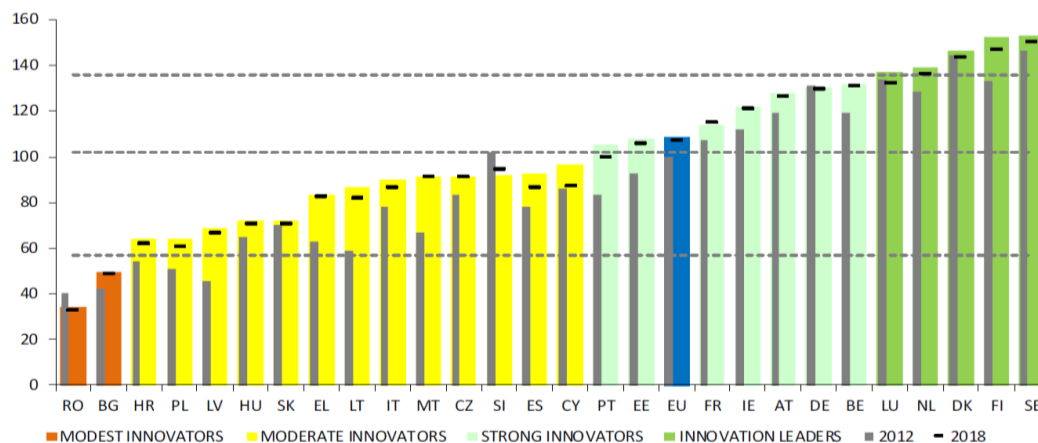


Figure 1. Performance of EU Member States' innovation systems, 2020

Coloured columns show Member States' performance in 2019, using the most recent data for 27 indicators, relative to that of the EU in 2012. The horizontal hyphens show performance in 2015, using the next most recent data for 27 indicators, relative to that of the EU in 2012. Grey columns show Member States' performance in 2012 relative to that of the EU in 2012. For all years the same measurement methodology has been used. The dashed lines show the threshold values between the performance groups in 2019, comparing Member States' performance in 2019 relative to that of the EU in 2019.

Source: European Innovation Scoreboard 2020, European Union 2020, p. 6.

https://ec.europa.eu/commission/presscorner/detail/en/QANDA_20_1150

In the ranking prepared by the US agency Bloomberg, the V4 countries are among the 40 most innovative countries in the world. Poland is ranked 24th in terms of Bloomberg's global innovation index, although of the V4 countries it is ahead of only Hungary. However, we can see a gradual improvement in this area, as it ranked 30th last year, while in 2012 it took 34th position. There is no improvement in the 2017 innovativeness report and the only country with V4, in which there was an improvement compared to 2010, is Slovakia, although it was not enough to leave the moderate innovators (MI) group anyway. Figure 1 shows improvement in 2019.

In 2010, Poland held the 50th position, and in 2015 - 67th out of 144 countries. In the Hungarian economy, the changes were even greater, as it fell from the first fifty to the 127th position in 2015. The Czech Republic ranked relatively in the best position in 2015, ranking the 38th position in 2015. In the mentioned reports, the innovativeness of the presented economies is explained by 6 variables: quality of scientific research institutions, R&D expenditure of enterprises, cooperation of science with industry in the field of R&D, government support for technologically advanced products, availability of qualified human capital (scientists) and the number of patent applications. Analysis of data contained in Table 3 shows that Poland in this comparison is very unfavorable. The highest result was achieved in 2015 in terms of government tender procedures for technologically advanced products. Lower results according to the analyzed criteria were achieved by Slovakia, although all

indicators improved during the period considered. A positive phenomenon is the increase in the number of patents in this country in the last analyzed year. The Czech economy has the most favorable situation in the context of the conditions of innovation. The highest values of this country resulted from the highest measures of R&D enterprises' expenditure as well as access to qualified scientists and engineers. In turn, Hungary had the highest number of patents (25 patents per million inhabitants, compared to 7 in Poland), the highest quality indicator for scientific research institutions and cooperation between science and industry in the field of R&D.

Table 3. Innovation measures in the V4 countries in 2010 and 2015

Specification	Czech Republic		Poland		Slovakia		Hungary	
	2010	2015	2010	2015	2010	2015	2010	2015
Capacity for innovation	4.1	4.6	3.3	3.8	2.9	3.5	3.6	3.0
Quality of scientific research institutions	5.1	4.5	4.1	3.0	3.3	3.9	5.2	5.1
Company spending on R&D	4.0	3.7	3.0	2.8	3.0	3.1	3.0	2.9
University-industry collaboration in R&D	4.5	4.0	3.6	3.5	3.3	3.4	4.3	4.3
Government procurement of advanced technology products	4.2	3.0	3.7	3.2	2.7	2.9	3.2	3.2
Availability of scientists and engineers	4.4	4.2	4.2	4.2	4.0	4.0	4.4	4.2
Utility patents per million population	4.2	15.8	0.9	7.1	1.9	9.2	4.6	25

The indexes are in the range from 1 to 7 points; „1” is the smallest and „7” is the most innovative; weighted averages.

Source: own study based on: The Global Competitiveness Report 2010-2011 and 2014-2015. 2011 and 2015. WEF, Geneva, Switzerland p. 488-494 and p. 530-536.

Difficulties in explaining differences in economic development and innovativeness of the country increased, which turned the researchers' attention to soft factors (Będzik & Łoś-Tomiak, 2016; Kaasa et al., 2007; Pérez-Luño et al., 2011; Tura & Harmaakorpi, 2005). In the literature of the subject, innovativeness is combined with the concept of social capital, which level and quality are determined by the processes of creating and disseminating innovations (Casanueva & Gallego, 2010; Wann-Yih et al., 2008; Dakhli & De Clercq, 2003; Florida et al., 2002).

The most important component of social capital, which is the starting point for materializing the benefits of it, is trust. This is the basis for cooperation, participation or involvement in activities. Using a novel panel data on co-owned patents across 29 countries, Brockman et al. (2018) show that “firms in high trust countries are able to produce a higher level of joint output (i.e., co-owned patents). They further show that open innovation is the channel through which societal trust promotes innovative efficiency. Overall, their study establishes societal trust as a key factor in influencing the efficiency of open innovation.” “According to the European Social Survey (ESS), in terms of the general level of trust all V4 countries occupy the last four places among the European countries. V4 respondents think that people in their countries mostly look out for themselves and are not helpful, most people can not be trusted and most people try to get advantage of others rather than to be fair” (Figure 2) (Murphy et al., 2016).

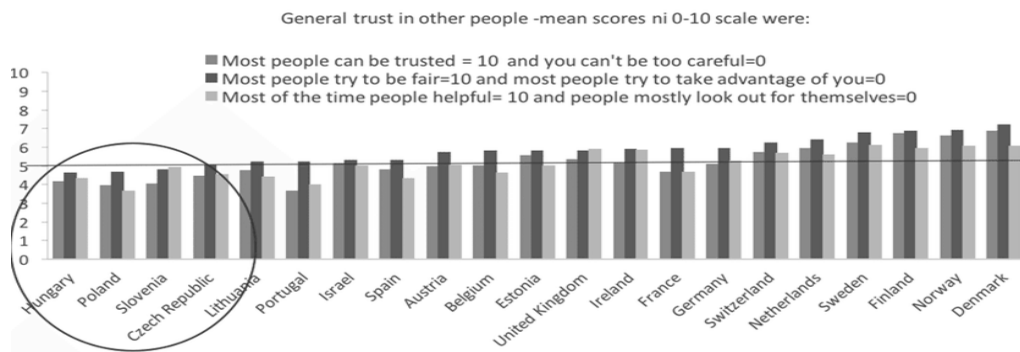


Figure 2. General level of trust, Visegrad Group compared to other EU countries. Source: Koszewska et al. (2015).

„Low levels of trust and social capital (Figure 3), understood as networks of people with similar values, indicate that the societies in V4 countries are not motivated to act in accordance with the idea of common good, including environmental protection, and, in the longer term, to build a sustainable economy. As a result, financial incentives remain most effective.” (Koszewska et al., 2015, p. 27)

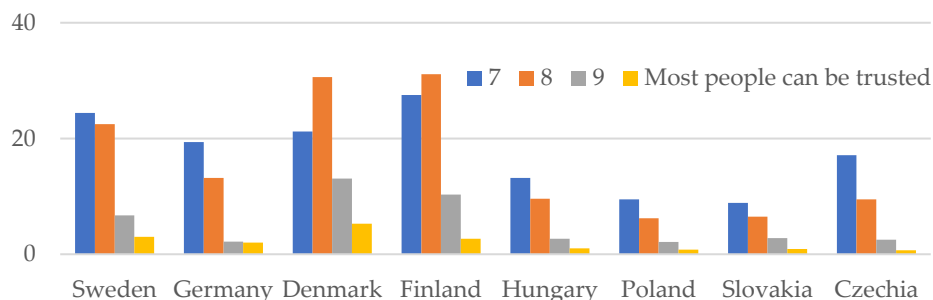


Figure 3. The percentage of people aged 16 and more trusting other people in selected countries in 2018. Source: own calculations based on European Social Survey (ESS) 2018; <http://nesstar.ess.nsd.uib.no>.

Note: The percentage of responses 7-10 on the 0 - scale you can never be too careful; 10 - most people can be trusted.

All V4 countries are characterized by a low level of social capital and its individual components in comparison with other countries of EU. The data presented in Table 4 indicate a relatively high position, i.e. among the countries leading according to this criterion, only in terms of the engagement of government stakeholders. The worst results were obtained by all countries with regard to volunteering. In this analysis, Hungary appears to be the worst, which in all categories belong to the countries with the lowest level of the examined category, in addition to trust in the police, which ranked at the average level among EU countries. This situation remained at a similar level during the period considered, and in the case of voter turnout, despite relatively poor results, it even deteriorated.

Table 4. Social capital in the V4

Indicator	Czech Republic		Hungary		Poland		Slovakia	
	Tier	Change	Tier	Change	Tier	Change	Tier	Change
Trust in others	3	2013	3	2013	2	2013	2	2013
Trust in the police	3	2013	2	2013	3	2013	3	2013
Trust in the national government	2	↑ 2005-2018	3	↔ 2005-2018	2	↔ 2005-2018	2	↑ 2006-2018
Voter turnout	3	↓ 2006-2013	3	↓ 2006-2014	3	↑ 2005-2015	3	↑ 2006-2018
Government stakeholder engagement	1	2014	3	2014	1	2014	1	2014
Volunteering through organisations	3	2011/2012	No data available		3	2011/2012	3	2011/2012

1 – top-performing OECD tier, latest available year; 2 – middle-performing OECD tier, latest available year; 3 – bottom-performing OECD tier, latest available year; ↑ - improving over time; ↓ - worsening over time; ↔ - no change

Source: own study based on: How's Life? How's life in the Czech Republic; Hungary; Poland; Slovak Republic. 2018. Measuring Well-being, OECD Publishing, Paris. https://read.oecd-ilibrary.org/economics/how-s-life-2017/how-s-life-in-the-czech-republic_how_life-2017-15-en#page225.

Figure 4 presents a rather varied picture of R&D intensity across EU Member States, ranging from 0.38% to 3.17% in 2014. Northern European Member States such as Finland and Sweden not only share a pattern of high expenditure, they have also adopted the most ambitious national targets. In 2014, Denmark achieved its national R&D target of 3% and the Czech Republic reached 1.97%. Other V4 countries have not even approached the target.

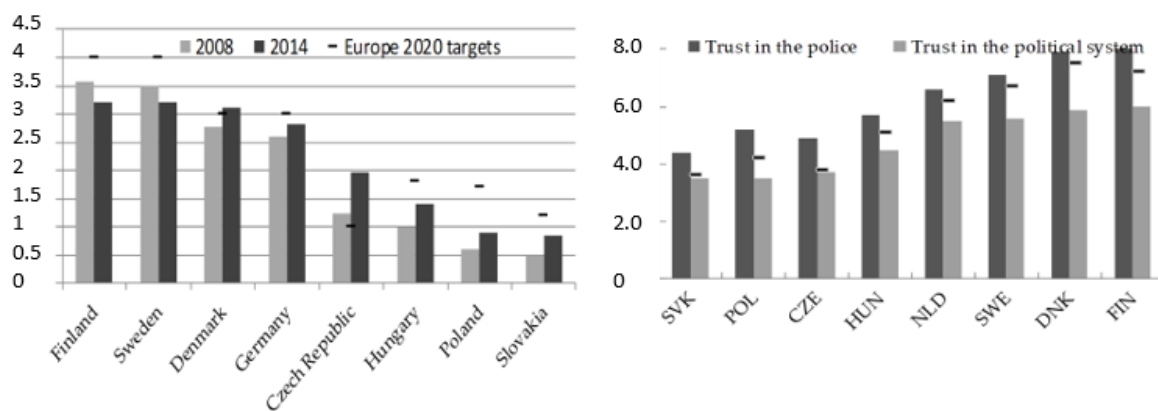


Figure 4. Gross domestic expenditure on R&D, by country, 2008 and 2014 (% of GDP) (left figure). Source: own study based on Eurostat; <https://ec.europa.eu/info/statistics>.

Figure 5. Trust in public institutions in European countries, 2018 (right figure)

Note: Response options range from 0 (No trust at all) to 10 (Complete trust) to the question: How much do you trust: The political system in [country]/The legal system in [country]/The police in [country]? The OECD EU average is the population-weighted average of the values included in the chart.

Source: own compilation based on OECD from <https://stats.oecd.org>

The presented research results indicate the dependence of the level of innovation on social trust, and trust in the V4 countries is relatively low compared to the innovation leaders. This is evident in every comparison carried out. The V4 countries are characterized by low

level of trust in the legal system, political system and the police, although among the analyzed institutions, the level of trust in the police is the highest in every country (Figure 5).

The financial crisis and its adverse impact on GDP growth in the following years, along with a rise in nominal government spending on R&D, led to an increase in R&D intensity in most Member States of EU between 2008 and 2014. The exceptions were Finland and Sweden. Growth in R&D expenditure over the same period has been most pronounced among countries with generally low R&D spending such as Slovakia and Czech. The observed trends show that most Member States have put R&D investment high on the policy agenda for combating the effects of the crisis. However, despite these increases the Visegrad Four (except Czech Republic) states would require significant acceleration of R&D intensity growth to meet their respective national target.

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The growing complexity of technology and the growth of specialization mean that innovation increasingly requires the ability to quickly learn and cooperate within a network of connections. Innovative enterprises rely to a large extent on external networks as an important factor in creating, increasing and seeking new development opportunities and profits. Resource in social capital provides access to a variety of resources and networks, increasing the innovative possibilities of enterprises. Therefore, the new innovativeness model is based on the inclusion of various partners outside the company in the development process of the new product, including customers, users, suppliers and research centers (Alguezali & Filieri, 2010). The level of general interpersonal trust has a statistically significant positive impact on innovation. A higher level of social trust, avoiding costly and time-consuming monitoring, has a positive impact on cooperation and increases time and resources that can be spent on innovation activities. Akçomak and ter Weel (2009) have shown that the impact of public confidence on economic growth results from its statistically significant positive impact on innovation. Similar conclusions on the basis of research were formulated by de Dakhli and Clercq (2004) and Kaasa (2007) proving the significantly positive impact of the level of trust in institutions and the activity in associations on innovativeness.

Social capital, especially in the form of engaging people from the immediate environment in their own entrepreneurship, has a significant impact on the likelihood of engaging in a start-up. Research using microeconomic data shows that social capital is conducive to the likelihood of engaging in a start-up in the form of general entrepreneurship standards in society (Parker, 2011) and the support of loved ones (Davidsson & Honig, 2003). In the Davidsson and Honig (2003) studies, the importance of social capital for the probability of getting involved in the start-up is even higher than the importance of human capital. These authors also show that support for relatives and membership in business organizations (e.g.

chambers of commerce) and other associations have a significant impact on the continuation of activities related to the development of a new enterprise.

Social capital has a significant impact on both progressive and breakthrough innovations, while the impact on incremental innovativeness is slightly higher. Landry et al. (2002), based on research involving companies from the Montreal area, showed that participation and relational capital are the most important factors determining the likelihood of company innovation. At the same time, they distinguished four forms of social capital: 1) the level of trust; 2) networks of connections (business, information, research), which are the source of information; 3) participation capital (frequency of participation in meetings and associations of companies from a given sector); 4) relational capital (personal knowledge with people employed in organizations that support entrepreneurship or universities, as well as with clients and suppliers). At the same time, in their research, the influence of the level of confidence on total innovation and breakthrough innovativeness is not statistically significant, as well as participation. The social capital in the form of a network of connections and relational capital has a significantly positive impact.

In the works of Subramaniam and Youndt (2005), social capital in the surveyed companies is measured by the level of cooperation and knowledge sharing between employees and partners outside the company. The research results identified social capital as a catalyst for the positive impact of human capital on breakthrough innovativeness. Delgado (2011) also distinguishes social capital (knowledge coming from informal and personal relations between employees) and relational capital (benefits related to relations with partners outside the company: customers, suppliers or strategic partners), which impact on breakthrough and progressive innovation turned out to be significantly positive.

4. Discussion

Summarizing the analysis carried out and the research results cited, it should be stated that:

- All V4 countries are characterized by a low level of social capital, compared to other EU countries;
- All V4 countries have the lowest levels of overall confidence among EU countries;
- The V4 countries achieved a relatively high position only in terms of the involvement of government stakeholders, and the worst in the field of volunteering. In this respect, Hungary has the lowest position in the ranking, which achieved the lowest level in all compared categories (trust in others, trust in the national government, etc.). The exception was trust in the police, formed at an average level among EU countries. This situation remained at a similar level in the analyzed period, and in the case of voter turnout, despite relatively poor results, it even worsened;
- Low levels of trust and social capital, understood as networks of people with similar values, indicate that the societies in V4 countries are not motivated to act in accordance with the idea of common good, including environmental protection, and, in the longer term, to build a sustainable economy;

- The V4 countries are characterized by low level of trust in the legal system, political system and the police, although among the analyzed institutions, the level of trust in the police is the highest in every country;
- The years after the financial crisis led to an increase in R&D intensity in most EU countries, except Finland and Sweden. The increase in R&D spending over the same period was also visible in countries such as Slovakia and the Czech Republic. However, despite these increases, the V4 countries (with the exception of the Czech Republic) have not achieved their intended target.

Social capital is conducive to innovativeness and involvement in start-up activities. Based on the results of the research, the most important aspects can be determined. Among them: general interpersonal trust, trust in institutions, social norms and patterns supporting entrepreneurship and creativity, participation capital and relational capital (both related to the intensity of the network of connections). These results are confirmed by the analysis of international innovativeness rankings, in which 10 countries that ranked the highest in terms of various aspects of social capital included in World Values Survey (WVS) and European Social Survey (ESS) surveys are at the same time characterized by the highest innovativeness indicators (National Bank of Poland, 2016).

In the literature of the subject, researchers attribute a key role in creating technical progress indispensable in socio-economic development to various factors. For example, Lucas (1988) focuses on the importance of human capital, while Romer (1986) emphasizes the importance of the research and development sector. Without neglecting the weight of either factor, it should be noted that full and effective use of these factors requires additional conditions. The most important of these is the existence of a cooperation network between actors (Gust-Bardon, 2012). At the same time, it should be remembered that only the fully functional and non-erodible tissue that connects all elements of the system will allow to achieve benefits from the synergy effect. Even the highest quality human capital is not able to stimulate or maintain progress individually. There must be some level of cooperation, and this requires trust, communication and social participation, in other words widely discussed social capital. It is also important that such a conclusion does not apply only to enterprises, because in the era of globalization and integration, they compete and cooperate in search of comparative advantages for entire regions and even countries. And that means that the radius of influence of social capital increases significantly.

In the conditions of globalization and far-advanced integration, innovation is determined by a high level of social capital. It is widely believed that the barrier to the growth of innovation is the low level of funding for creative solutions. This is particularly important in relatively poor economies, which include the V4 countries and which do not have significant resources for R&D. Unfortunately, the problem is much more complicated, because it is not enough to increase expenditures on innovation, because an improperly shaped economy will not be able to absorb them. Therefore, economies with lower R&D funding opportunities should increase their efforts to build social capital, thanks to which even small funds can give greater effects in terms of innovation than large expenditures,

which without an appropriate level of social capital will not bring an increase in innovation. In the area of soft factors from among the V4 countries, relatively the best indicators are reached by Slovakia and the Czech Republic, especially in relation to trust, while the worst in the area of participation. On the basis of this analysis, Hungary obtained the worst results, which in the face of the results of innovation and R&D expenditure suggests the need to intensify efforts to build favorable conditions for future development. Therefore, the level and quality of social capital, which determines effective cooperation and absorption of innovative solutions, is of key importance.

5. Conclusions

It can be assumed that such conclusions bring some optimism for the Visegrad Group, due to the fact that in the face of lack of financial resources, they could use social capital to develop innovativeness. Unfortunately, the analyzes carried out in the article indicate that social capital in these economies is perhaps even a more deficit commodity than financial resources. And that means that o should immediately get involved in its creation, because, as shown by the analysis, the shortcomings of social capital will be a significant barrier to improving the innovation of V4 economies even with financial support. According to the studies of the Srholec (2014) government programmes initiating on innovation have the potential to induce durable changes in the innovative behavior of firms. While without social capital, and therefore without trust and cooperation, no financial means will be able to raise the economy to a higher level of innovative development, and any inflow into the economy will be wasted.

Among the analyzed economies, the Czech Republic has relatively the best results in comparisons, both in terms of innovation and social capital components. Also, in the analyzed decade, an improvement of the analyzed indicators can be seen. The worst results in this ranking were achieved by Poland and Slovakia. Hungary maintains a steady albeit low level of both trust and innovation.

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