EUROPEAN SPATIAL RESEARCH AND POLICY

Volume 21 2014 Number 1

https://doi.org/10.2478/esrp-2014-0009

REVIEW ARTICLES

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THE LEVEL OF SOCIAL CAPITAL, INNOVATION AND COMPETITIVENESS IN THE COUNTRIES OF THE EUROPEAN UNION (EU)

1. THEORETICAL FRAMEWORK

Social capital has become a widely accepted concept in the field of politics, sociology and the economy, thanks to the groundwork of authors Bourdieu, Coleman and Putnam. Bourdieu's thoughts on the benefits individuals obtain through group membership (Bourdieu, 1986) and Coleman's contribution to the research on the transfer of social capital through education from generation to generation (Coleman, 1988), led to the current concept of social capital. Putnam's definition includes factors of trust, network structures and norms, which support cooperation between subjects in a society leading to mutual benefits. Putnam thus used the original social capital of individuals (Bourdieu, 1986; Coleman, 1988) and formed the concept of collective-territorial social capital.

Extending the concept of social capital to the level of community and region made it a concrete concept of the society which enables people to cooperate for common interests (van Oorschot, Arts and Gelissen, 2006). Collective behaviour should be connected to general trust, which can be found in social networks and voluntary associations, because repeated interaction leads to the creation of the

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norm of general reciprocity and reliability between members of a large group (Putnam, 2000). Societies in which mutual reciprocity is present are more efficient, because reciprocity contributes to beneficial collective behavior (van Oorschot, Arts and Gelissen, 2006).

Social capital, like other aggregate and multidimensional concepts, is hard to measure. Many authors analyze social capital through its three basic dimensions (components) – trust, norms and networks (i.e. Dakhli and de Clarcq, 2004; Doh and Acs, 2010).

2. SOCIAL CAPITAL BENEFITS

Social capital is nowadays considered as the fourth type of capital alongside the financial, human and physical capital. Physical capital, which has been simplistically regarded as the main source of economic growth in the past, explains the economic results jointly with human and social capital and their interactions (Piazza-Georgi, 2002). Social capital can be understood also as a partnership (especially public-private partnership) (Hudec, 2007), which is an inseparable part of human actions and its effective realization yields positive synergic effects (Sucháček and Koľveková, 2005). Social capital can have impact on career success and the creation of human capital on the individual level, on the inter-firm level it enables the exchange of resources and innovation of products and finally, on the national level it influences the economic development and growth (Zhang and Fung, 2006).

2.1. Benefits in Terms of Innovation

Over the last 50 years the concept of innovation has undergone many changes. At first, it was considered an event that was the result of inventors' and researchers' knowledge. Today, innovation is regarded as the result of a process that depends on the interactions and exchange of knowledge between diverse subjects (Landry, Amara and Lamari, 2002). It is 'the process of introducing a new product or service to the market, […] an interactive process involving both formal and informal relationships among various actors interacting through social networks' (Doh and Acs, 2010, p. 241). Innovation in this sense is the combination of research and development and social capital.

The relationship between social capital and innovation faces certain limitations. The results of research differ, some are positive (e.g. Coleman, 1988), some are negative (e.g. Dasgupta, 2000). Generally, developed social capital has a positive impact on innovation (Doh and Acs, 2010) and societies with low levels of social capital are exposed to higher transaction costs (Maskell, 2000).

Social capital supports the flow of knowledge within (regional and local) economies, and thus becomes an important indirect source of innovation (Miguélez, Moreno and Artís, 2011). In regions where the relationships are based on trust, common values, solidarity and mutual support, there is higher membership in social organizations and social capital is on a higher level, while low trust can result in lower innovation (Putnam, 1995). The research results dealing with the relationship between social capital and innovations are summarized in table 1.

Table 1. Social capital and innovation

Authors	Social capital	Innovation	Sample	Results
Doh and Acs (2010)	Trust, networks, norms	The number of patents, R&D expenditures	53 countries	Social capital has a positive impact on innovation
Ackomak and ter Weel (2006)	Trust	The number of patent applications, ratio of R&D employees on total employment in the business sector	102 European regions	Trust has a positive impact on the number of patents
Dakhli and de Clercq (2004)	Networks, general and institutional trust, norms	The number of patents, R&D expenditures, export of high-technology firms	59 countries (30 from Europe)	None of the dimensions of social capital influence the number of patents. Higher institutional trust supports the export of high-technology. Higher norms lower the export of high-technology

Source: self-processed based on Akcomak (2006), Dakhli and de Clercq (2004), Doh and Acs (2010).

2.2. Benefits in Terms of Competitiveness

National and regional competitiveness is becoming more connected to the main intangible inputs – the workforce and social capital (Nielsen, 2000). Also, the authors of the Global Competitiveness Report 2008–2009 (p. 3) define competitiveness as the 'the set of institutions, policies and factors that determine the level of productivity of a country'. Competitiveness is understood as the ability of the country to produce higher level of income for its citizens and also the probability that the country will grow faster in the medium to long term (Global Competitiveness Report 2008–2009). Therefore, competitiveness is generally seen as the achievement of prosperity and well-being of the population (Hudec, 2007). Socio-

economic factors like culture, values, the accumulation of social capital and the existence of social networks are the most important factors for the long-term international competitiveness and economic development (Grupe and Rose, 2010).

Countries or regions with high levels of social capital are associated with higher levels of political and economic performance (Putnam, 2000) and also with the growth of competitiveness (Skokan, 2004). Access to social capital means higher competitiveness and social solidarity, while lack of social capital is related to missing economic success and consequently to social exclusion (Harloe, 2001). The main existing research results dealing with the relationship between social capital and competitiveness are summarized in table 2.

Table 2. Social capital and competitiveness

Authors	Social capital	Competitiveness	Sample	Results
Bronisz and Heijman (2010)	Knowledge (the number of students with higher secondary, vocational and university education), associational activity (the number of non-state organizations, volunteers, cultural activities and other), local election participation	Competitiveness index defined as: – inputs: business density, economic participation, knowledge-based firms – outputs: GDP *per capita*, – outcomes: unemployment and income	16 regions in Poland	Social capital has a positive impact on growth and competitiveness of regions in Poland
Ackomak and ter Weel (2006)	Trust	growth of GDP *per capita*	102 European regions	Social capital has a direct influence on the economic results. Innovations represent an important element, through which social capital influences the economic growth
Knack and Keefer (1997)	General trust and norms	Average annual growth of income per capita, GDP *per capita*	29 countries	Trust and civic norms have a positive impact on economic growth and prosperity

Source: self-processed based on Akcomak and ter Weel (2006), Bronisz and Heijman (2010), Knack and Keefer (1997).

Generally, innovation activities represent the base for future competitiveness in the form of new knowledge and products, thus increasing the effectiveness of the economy (Bobáková, 2007). Innovation processes prosper also due to trust, networks and norms, which lower transaction costs, increase the quality and quantity of information, facilitate coordination and lower the level of common problems. Social capital strengthens innovation and innovations generate economic growth and development (Nielsen, 2003). This paper analyzes the level of social capital, innovation and competitiveness in the EU countries, and their mutual relationship based on the main existing research of the respective indicators.

3. METHODOLOGY

The aim of the paper is to investigate the relationship between the level of social capital and innovation and competitiveness in the EU countries. Existing research justifies setting the following two research hypothesis:

- A positive dependence exists between social capital and innovation.
- A positive dependence exists between social capital and competitiveness.

The research relies on three key representative sources. The basis for the comparison in the area of innovation is the European Innovation Scoreboard 2009 (EIS). For the purpose of the paper five EU countries from each innovation category were chosen, except for the last category, where only three EU countries were available. The data used for assessing social capital come from the last wave of the European Values Study (EVS) releazed in 2008. The data used for assessing the competitiveness of countries comes from the Global Competitiveness Report 2008–2009 (GCR).

The relationship between the social capital dimensions, innovation and competitiveness is verified using the Pearson correlation coefficients and the general model of linear regression, which can be expressed in the following form (Hatrak, 2007):

$$y_i = \beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + \ldots + \beta_k X_{ik} + u_i \qquad (1)$$
$$i = 1, 2, \ldots, n$$

where y represents the dependent variable (innovation or competitiveness), X1, X2, …, Xk, are the independent variables (the individual dimensions of social capital), u is the unobservable error estimate and parameters β_0, β_1,β_2, …, β_k are the coefficients which should be estimated. In the paper two models of linear regression are used, which were tested for the presence of normality distribution (Jarque-Bera Normality test), heteroscedasticity (Breusch-Pagan test), autocorrelation (Durbin-Watson test) and multicollinearity.

3.1. Social Capital Measurement

Based on the previous research into social capital (van Oorschot , Arts and Gelissen, 2006; Knack and Keefer, 1997), social capital is measured using the following dimensions (see table 3): trust, networks and civism (term given by van Oorschot to social norms and political engagement). Each dimension is analyzed by two aspects, while each aspect is measured using EVS questions.

Table 3. Social capital dimensions

Dimension			Question
Trust	General trust		Generally speaking, would you say that most people can be trusted or that you cannot be too careful in dealing with people?
			Do you think that most people would try to take advantage of you if they got the chance, or would they try to be fair?
	Institutional trust		Please look at this card and tell me, for each item listed, how much confidence you have in them, is it a great deal, quite a lot, not very much or none at all?
Networks	Formal networks		Please look carefully at the following list of voluntary organizations and activities and say which, if any, do you belong to?
			Please look carefully at the following list of voluntary organizations and activities and say which, if any, are you currently doing unpaid voluntary work for?
	Informal networks	Socializing with friends	How important are friends and acquaintances in your life?
		Socializing with family	To what extent do you feel concerned about the living conditions of your immediate family?
			How important is family in your life?
Civism	Social norms		Please tell me for each of the following whether you think it can always be justified, never be justified, or something in between
	Political engagement		When you get together with your friends, would you say you discuss political matters frequently, occasionally or never?
			How often do you follow politics in the news on television or on the radio or in the daily papers?

Source: self-processed based on data: EVS (2011), van Oorschot, Arts and Gelissen, (2006).

Trust: this dimension distinguishes between general and institutional trust. General trust, also called interpersonal trust, is assessed by questions examining trust or distrust. Institutional trust is measured by questions examining the trust towards different institutions (church, armed forces, education system, the press, trade unions, the police, parliament, civil service, social security system, European Union, NATO, United Nations Organization, health care system, justice system, major companies, environmental organizations, political parties, government).

Networks: this dimension is divided into formal (membership of voluntary organizations and working unpaid for a voluntary organization) and informal (socializing with friends and family).

Civism: the third dimension of social capital represents the characteristics of people's attitudes and behaviour. Social norms of morality are measured by questions dealing with justifiable/unjustifiable behaviour of respondents in the case of, for example cheating on taxes, claiming state benefits respondents are not entitled to, lying in their own interest and other (together 22 questions). Political engagement is assessed by the degree to which respondents follow politics in the media, and discuss political matters with friends.

3.2. Summary Innovation Index in EIS

The Summary Innovation Index (SII) consists of composite innovation sub-indices (Human resources, Finance and support, Firm investments, Entrepreneurship, Throughputs, Innovators and Economic effects). The seven dimensions are then divided into three blocks (Enablers, Firm activities, Outputs). The block Enablers covers the main drivers of innovation, which are external to the company, the block Firm activities deals with the innovation activity of companies and the block Outputs covers outputs of company activities (European Innovation Scoreboard, 2009).

For the purpose of the paper, the following countries were chosen based on EIS: Denmark, Great Britain, Germany, Finland, Sweden, Austria, Belgium, Netherlands, Estonia, Slovenia, the Czech Republic, Greece, Slovakia, Poland, Lithuania, Romania, Latvia and Bulgaria.

3.3. Global Competitiveness Index in GCR

The Global Competitiveness Index (GCI) is based on 12 basic pillars of economic competitiveness (Institutions, Infrastructure, Macroeconomic stability, Health and primary education, Higher education and training, Goods market efficiency, Labour market efficiency, Financial market sophistication, Technological readi-

ness, Market size, Business sophistication and Innovation). Individual pillars have different influence on the development of countries; therefore GCI divides these pillars and countries into three development stages (1. Factor-driven stage, 2. Efficiency-driven stage, 3. Innovation-driven stage). Based on GCI 2008–2009 Bulgaria and Romania belong to the second development stage; Slovakia, Latvia, Estonia, Lithuania and Poland belong to the transition stage between the second and third stages, while the remaining analyzed countries belong to the innovation-driven stage, i.e. the last stage (Global Competitiveness Report 2008–2009).

4. STRUCTURED METADATA

Metadata are adopted and structured for the purpose of analyzing correlations. Table 4 depicts the summary results for individual countries in the area of innovation, competitiveness and social capital. The countries are ranked in a descending order, based on the results of the Summary Innovation Index: Sweden, Finland, Germany, Great Britain and Denmark belong to the innovation leaders; Austria, Belgium, Netherlands, Estonia and Slovenia belong to innovation followers; the Czech Republic, Greece, Slovakia, Poland and Lithuania belong to moderate innovators; and Romania, Latvia and Bulgaria belong to the catching-up countries. The values of innovation are the values of SII of individual countries, which represent the unweighted composite index. The values of competitiveness are the results of GCI of individual countries, which represent the weighted composite index. The calculation procedure of SII and GCI is stated in the EIS and GCR. The values of social capital represent the percentage of responses to each question. Questions relating to formal networks, social norms and trust in institutions are averaged, in each category of questions, *per se*.

Table 5 contains the results of correlation coefficients and the p-values for each dimension of social capital, innovation and competitiveness. The values of the Pearson correlation coefficient point to a strong and positive dependence between innovation and these social capital dimensions: participation in voluntary organizations, friends important, norms and trust. This means that the innovation of countries is significantly related to strengthening of trust, participation, norms and socializing with friends. From the stated follows that the first hypothesis (a positive dependence exists between social capital and innovation) was confirmed. It concerns the dimensions network and trust.

The same results of strong and positive dependence are detected also in the case of competitiveness. Therefore, if the competitiveness of a country increases, this is significantly related to the level of trust, participation and socializing with friends. However, strong and negative dependence exists between competitive-

Table 4. Overview of the results in individual areas

Country	Innovation	Competitiveness	Social capital									
			networks					civism			trust	
			formal networks*		informal networks			social norms*	political engagement		general trust	
					socializing with friends	*socializing with family*						
			particip.	*voluntary work*	*friends important*	*family important*	*family (living conditions)*	*norms*	*politics (media)*	*politics (friends)*	*trust*	*fairness*
Sweden	0.636	5.530	0.091	0.040	0.552	0.925	0.882	0.373	0.657	0.112	0.707	0.072
Finland	0.622	5.500	0.106	0.043	0.458	0.844	0.100	0.371	0.395	0.116	0.647	0.027
Germany	0.596	5.460	0.048	0.021	0.426	0.779	0.829	0.422	0.575	0.235	0.388	0.049
Great Britain	0.575	5.300	0.064	0.023	0.632	0.897	0.364	0.466	0.347	0.129	0.403	0.044
Denmark	0.574	5.580	0.183	0.326	0.606	0.879	0.716	0.454	0.684	0.274	0.76	0.233
Austria	0.536	5.230	0.063	0.032	0.568	0.790	0.319	0.459	0.521	0.172	0.368	0.098
Belgium	0.516	5.140	0.087	0.036	0.463	0.871	0.762	0.371	0.483	0.092	0.346	0.038
Netherlands	0.491	5.410	0.209	0.070	0.613	0.859	0.767	0.396	0.530	0.168	0.617	0.034
Estonia	0.481	4.670	0.054	0.028	0.289	0.750	0.618	0.506	0.485	0.115	0.326	0.044
Slovenia	0.466	4.500	0.072	0.041	0.486	0.835	0.461	0.485	0.429	0.067	0.242	0.062
Czech Republic	0.415	4.620	0.057	0.036	0.379	0.785	0.155	0.362	0.267	0.099	0.301	0.043
Greece	0.370	4.110	0.026	0.016	0.459	0.864	0.843	0.515	0.525	0.226	0.213	0.018
Slovakia	0.331	4.400	0.032	0.016	0.439	0.897	0.491	0.367	0.467	0.091	0.126	0.026
Poland	0.317	4.280	0.016	0.007	0.384	0.865	0.693	0.463	0.347	0.140	0.276	0.051
Lithuania	0.313	4.450	0.028	0.016	0.183	0.619	0.725	0.438	0.580	0.094	0.299	0.023
Romania	0.294	4.100	0.029	0.019	0.286	0.866	0.655	0.588	0.365	0.067	0.176	0.084
Latvia	0.261	4.260	0.033	0.027	0.274	0.684	0.539	0.481	0.524	0.147	0.255	0.027
Bulgaria	0.231	4.030	0.022	0.016	0.382	0.864	0.810	0.594	0.510	0.157	0.179	0.056
* Average per question category.												

Source: self-processed based on data European Innovation Scoreboard (2009), EVS (2011), Global Competitiveness Report 2008–2009.

ness and norms. The second hypothesis was confirmed only in the case of social capital dimensions networks and trust. In case of the dimension norms, the dependence was negative. Regarding other dependencies, the statistical significance, which should be confirmed by the values of Pearson correlation coefficient, was not proven.

Table 5. Values of Pearson correlation coefficient and the corresponding p-values

			Innovation
Innovation			*****
Competitiveness			0.932 (< 0.001)
Social capital	networks	*participation*	0.592 (0.010)
		voluntary work	0.342 (0.165)
		friends important	0.674 (0.002)
		family important	0.307 (0.215)
		family (living conditions)	–0.164 (0.514)
	civism	*norms*	–0.530 (0.024)
		politics (media)	0.238 (0.342)
		politics (friends)	0.241 (0.336)
	trust	*trust*	0.774 (< 0.001)
		fairness	0.292 (0.239)
		institutional trust	0.030 (0.907)

Source: self-processed.

Table 6 shows the results of linear regression. At first, all dimensions of social capital were included in the observation. The p-values were statistically significant in the case of innovation, socializing with friends and trust, and in the case of competitiveness, socializing with friends, norms and trust.

The models of linear regression can be expressed as follows:

Innovation = 0.14530 + 0.34926 friends important + 0.40092 trust + u.

The model can be accepted given the low p-value of 0.0002275 and the coefficient of determination of 62.96%.

Competitiveness = 4.5075+1.1258 friends important –1.9144 norms + 1.8242 trust + u.

Analogically, the model can be accepted given the p-value of 7.182e-06 and the value of coefficient of determination 80.81%.

Both independent variables have a positive impact on innovation, while trust has a greater influence, although only by a slight margin. If trust and socializing with friends increases in a country, the innovation is higher.

Socializing with friends and trust have a positive impact on competitiveness, while norms show a negative influence. If trust and socializing with friends grow in a country, competitiveness of that country grows as well. However, if the strength of norms increases in a country, it influences the competitiveness negatively. The impact of norms is the strongest in the model.

Table 6. The results of linear regression

Specification		Coefficient	Standard deviation	T-statistics	P-value
Innovation	β0	0.14530	0.06956	2.089	0.05417 .
	Friends important	0.34926	0.18843	1.854	0.08358 .
	Trust	0.40092	0.12660	3.167	0.00638 **
Competitiveness	β0	4.5075	0.5478	8.229	9.85e-07 ***
	Friends important	1.1258	0.5862	1.920	0.075414 .
	Norms	–1.9144	0.9586	–1.997	0.065642 .
	Trust	1.8242	0.4220	4.323	0.000702 ***
Statistical significance: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1					

Source: self-processed.

5. CONCLUSIONS

The new stage of an economy driven by innovation and securing the competitiveness of a country require on the one hand the development of high-tech firms (Kraftová and Kraft, 2008), but on the other hand it is necessary to develop also the social capital in the country, which is confirmed by the research results. The

values of the Pearson correlation coefficient and linear regression show a strong and positive dependent relationship between social capital, innovation and competitiveness. Socializing with friends and especially trust from the social capital dimensions positively influence innovation and competitiveness. On the other hand, norms have a negative influence on competitiveness.

The determination of the dependence between social capital and innovativeness or competitiveness was based on already compiled indices of innovation and competitiveness, which are constructed in a more complex manner and take into account more indicators than just, for example, the number of patents in case of innovation, or GDP per capita in case of competitiveness, like other existing research studies.

The existing theoretical conclusions (e.g. Akcomak and ter Weel, 2006; Dakhli and de Clercq, 2004; Knack and Keefer, 1997), in which trust, in particular, showed a positive relationship with innovation and competitiveness of countries, are also confirmed by the results of this paper. On the other hand, in some of the existing studies (e.g. Dakhli and de Clercq, 2004) norms had a negative influence on innovation of countries or regions, which is confirmed by the results of correlation coefficients; however, in case of regression analysis, they were not statistically significant. It can be concluded that individual dimensions of social capital have a different impact on innovation or competitiveness, but also, that there exists a strong relationship between innovation and competitiveness. It has been proven in several studies (Clark and Ken, 1998; Porter, 1990) and it is natural due to the relatively strong penetration of the evaluated indicators.

The results of comparison of social capital between the EU countries show considerable differences in this area. The countries of Western Europe show a higher level of social capital than the countries of Central and Eastern Europe. According to several studies, the explanation lies in the fact that countries which experienced strong political centralization, during which an absolute monarch or state intentionally tried to eliminate competition for power, show lower levels of social capital (Fukuyama, 1995; Hudec and Urbančíková, 2008). Social capital, which possibly existed in the period before absolute centralization, was depleted. On the other hand, countries which have higher levels of social capital have never experienced a long period of centralized state power. With spread political power a large number of social organizations could prosper without such intervention and could become the base for economic cooperation (Fukuyama, 1995).

A differing standpoint is that former communist countries have a lower level of social capital due to lower level of economic development and poorer state institutions, and not because of communism. The problem of these countries is mainly corruption (Fidrmuc and Gerxhani, 2008). Also the main difference between countries is no longer institutions, but culture – the character of their civil societies, the social and moral traditions, which form the base of their institutions

and which differentiate them (Fukuyama, 1995). The culture and the historical development determine the level of trust in a society, which is a social capital dimension that improves the state of the economic system and shapes civic attitudes (Mularska-Kucharek and Brzeziński, 2012).

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