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SOCIAL CAPITAL AND GROWTH IN EUROPEAN REGIONS

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Abstract

Theories of economic growth at the regional and national level, have expanded the traditional production function of the Solow model towards a wide function that collects conditioning factors of labour productivity, measured by R & D expenditure, the number of patents, the human capital, the social capital or entrepreneurship rates. This set of factors have been developed by authors like Westlund (2006) and Koo and Kim (2009). The aim of this paper is to analyze regional growth in the EU, considering the differences between the EU15 and its eastern regions, using such set of factors and taking into account the limitations of existing data for this type of analysis.

JEL classification: O47, O18, O33, F15.

Key Words: Productivity, Education, Innovation, Economic Growth, Regional

1. Introduction

The analysis of economic growth, both at national and regional level, have expanded the traditional production function of the Solow (1956; 1957) model towards a wider function collecting several factors that have some impact on growth. Thus, generalization of human capital in that function has been established as an undeniable element in the literature of the 1990s. Despite the inclusion of these new factors –such as human capital– it seems that all the measures together did not gather all the causes that can influence growth, because they were unable to explain why economies with very similar starting points evolve differently, even if the other elements analyzed were similar. As a consequence, according to Putnam's work (Putnam, Leonardi, & Nanetti, 1993) applied to Italian regions, the analysis resulted in what today is known as social capital, which encompasses different factors such as trust, memberships and so on, and it has been included in economic growth models. Recent research has resulted in numerous papers that confirm the importance of social capital in economic growth and development (Helliwell & Putnam, 1995; Knack & Keefer, 1997; Krishna & Uphoff, 1999; Whiteley, 2000; Zak & Knack, 2001; Grootaert & Narayan, 2004; Lyon, 2005).

In this paper, we try to analyze regional growth in several EU countries using classical factors and we add R&D expenditure, the number of patents, human capital or entrepreneurship rates and social capital to the function. This set of factors has been developed by authors such as Westlund (2006), Akçomak & ter Weel (2008), Hauser, Tappeiner, & Walde (2007) and Koo and Kim (2009).

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2.- Social capital

There are many definitions of social capital, since the idea is relevant to numerous disciplines such as sociology, political sciences, economics, amongst others. Nevertheless, most definitions include terms such as networks, trust and so on.

This concept of social capital became important after the publication of works on education published by Coleman. These studies define social capital as anything that facilitates individual or collective action, generated by networks of relationships, reciprocity, trust and social norms. Coleman conceived social capital as a neutral resource that promotes all kinds of action to make society better off, as long as its individual uses generate welfare. Essays by Robert Putman (1993, 1996) on civic participation and institutional performance defined social capital as: “features of social organization, such as networks, norms and trust, which facilitate co-ordination and co-operation for mutual benefit.”

So, social capital is a multidimensional and complex concept. It does not have a single definition, but many of the existing definitions include terms like networks, trust, civic co-operation and norms. Besides, there is still much debate as to whether or not social capital constitutes a “capital” in the same way as a physical, natural and human capital. There are several researcher lines that show social capital is a “capital”. So, Robison (1999), Adler and Known (2000) and Semith (2009) describe several characteristics of social capital similar to those of any other capital. Social capital, like other forms of capital, is a resource which may be the object of investment with the expectation of future profits and benefits. Further, social capital can be a substitute for, or a complement to other resources. As a substitute, agents can compensate for deficiencies in financial or human capital by establishing good relations amongst themselves. Social capital must be considered as complementary to the other forms of capital since it is not capable of generating development by itself. In addition, social capital needs to be “serviced” or maintained –like physical and human capital– in order to prevent its efficacy and efficiency from fading. Similarly, in consonance with human capital, the rate of depreciation for social capital is difficult to evaluate, as repeated usage might tend to strengthen stocks of capital rather than the reverse and, neglecting to use them, certainly leads to depreciation.

Therefore, social capital is the result of a process of dynamic interaction: it is created, may increase or be destroyed, either deliberately or otherwise, and requires constant investment. Hence, for all of the above reasons, social capital should be considered as a form of capital rather than influencing economic development, as other forms of capital such as, natural, physical and human capital.

Social capital in European regions

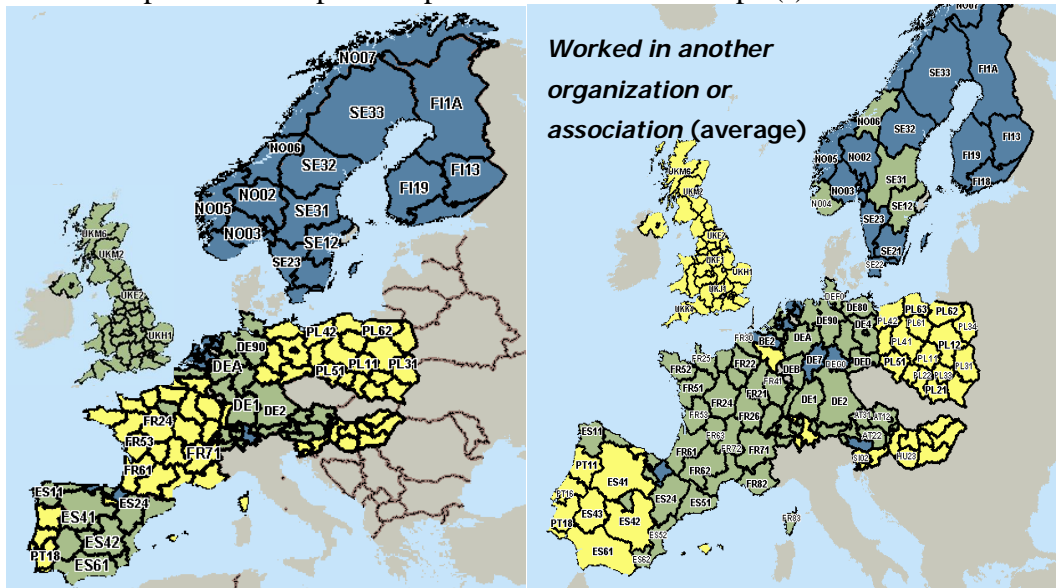
In most of the studies that look at social capital, one of the main variables used is trust (Knack and Keefer, 1997; Whitely, 2000; Helliwell 1996; Roth, 2007; Berggren, Elinder & Jordahl, 2007; Dinda, 2008, Neira, Vázquez y Portela, 2009). The variable usually includes different types of trust or confidence, ranging from confidence in members of the family, neighbours, the people of one’s country, etc.

Other studies have group like proxy for social capital (Helliwell, 1996; Knack, 2003; Coates & Heckleman, 2003). While the trust or confidence shown in most studies as a positive variable for developing economies, being a member of a group may have positive or negative effects depending on the type of partnership which we are talking about

We now turn to the analysis of the social capital situation in European regions. In order to measure social capital, we shall use data by the European Values Survey (waves one to four). The variables we select to quantify social capital measure trust and memberships. Trust is derived from the question: “*Generally speaking, would you say that most people can be trusted, or that you can’t be too careful in dealing with people?*” Answers vary from 1 (you can’t be too careful) to 10 (most people can be trusted). We have grouped 6 to 10 values resulting in the percentage of interpersonal trust. Memberships are derived from two questions of the survey: “*During the last 12 months, have you done any of the following: (...) worked in a political party or action group?*” and “*(...) worked in another organisation or association?*” Answers are “*Yes*” or “*No*”. We take the percentage of “*Yes*” as membership.

The European Values Survey provides us with data at a regional level applied to a set of European Countries, but a different level of NUTS. So, for Belgium, Germany, France and the United Kingdom, the level is NUTSI. For Austria, Spain, Finland, Hungary, Norway, Poland, Sweden and Switzerland, the level is NUTSII, and for the Netherlands and Slovenia, NUSTIII is the regional level. We have grouped the regions of these last two countries into level NUSTII. In the countries at level NUTSI, we assign the data of the main region to the sub-regions (level NUTSII).

Map 1: Social capital Map 2: Active Memberships (I)



Source: Own elaboration. Data taken from the ESS (waves 2002, 2004, 2006 and 2008). The percentage of trust is the sum of values 6-10. The percentage of participation is answer “yes”.

We shall start with the analysis of trust. In the map, we present the situation of social capital at a regional level taking the average values of the survey's four waves.

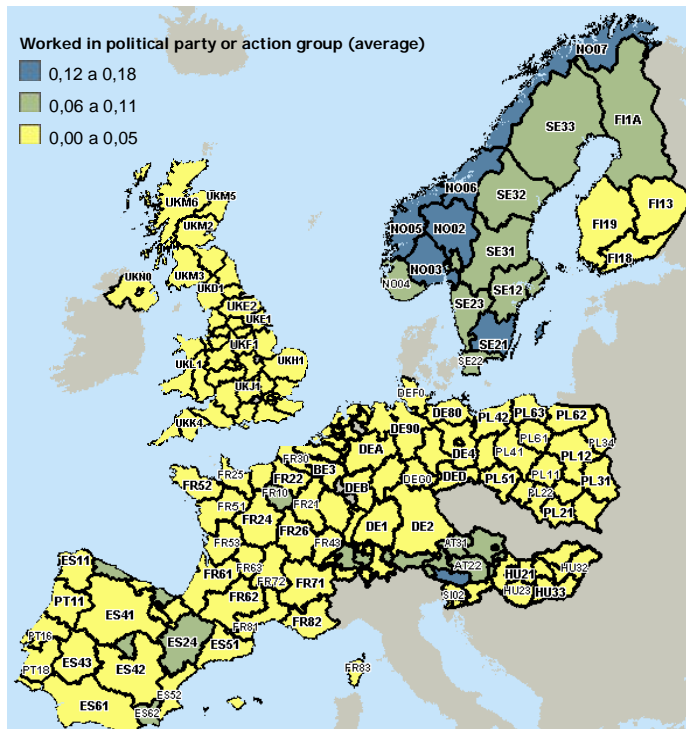
As we can see in the map, the Nordic countries plus the Netherlands and Switzerland are countries with a high level of trust, with values above 55 per cent. In the other end of the spectrum are France –except the region of Île de France, Portugal, Poland, Hungary, Slovenia and East Germany –except Berlin.

We analyze now the participation in social activities. The first variable to analyze is worked in another organization or association in the last 12 months. The situation of this variable in European regions is shown in map 2:

In this map we can see the Nordic regions shown, again, higher values with Nederland and some regions of Austria and Germany. Values of participation are too much lower than trust. Central countries of Europe show medium values and ex-communist countries, as well as most of Spanish Regions, Portugal and United Kingdom have lower values.

The second variable we have chosen to measure active membership measures political or action group participation. Values of this variable are very lowers, it does not reach 20 per cent in any region. Highest values correspond to regions of Norway, one region of Sweden and one region of Austria. The rest of European regions show values less than 5 per cent, except Sweden, Austria, some regions of Switzerland, few regions of Spain and regions include capital of country in Belgium and France. We can see this in the map 3:

Map 3: Active memberships (II)



Source: Own elaboration. Data has taken of the ESS (waves 2002, 2004, 2006 and 2008). The percentage of participation is answer “yes”.

If we take the results of the analysis as a whole can we say that there are three large blocks to speak of social capital in Europe. Thus, a first block would consist of the Nordic countries with Switzerland and the Netherlands. A group with a medium level of social capital, which could include Germany, United Kingdom, Austria and Spain; and a final group, with a low level of social capital which would be the former communist regions with France and Portugal.

Empirical analysis

Since the appearance of the first works by Solow (1956, 1957) in which the function of production is related to savings (i.e., capital investment), population growth (i.e., labour), and technological change, the number of factors to be considered have increased.

In line with the work presented at national level (the revision of this models can be found in Guisán, M.C. and Neira, I. (2006) initially used by Barro (1991, 2001) and Mankiew, Romer and Weill (1992), and Noneman and Vanhoudt (1996), they include human capital as an explanatory variable within the production function in order to study how variations in this kind of capital affect the rate of economic growth. In the second kind of model, human capital does not exert a direct influence on growth, but acts indirectly by increasing the accumulation of technology. These models are analysed by Romer (1990), Kyriacou (1991) and Benhabid and Spiegel (1994). Some of these works - Romer (1990), Benhabid and Spiegel (1994), and Barro (2001) go further by suggesting that there is a

relationship between physical and human capital, in the sense that human capital might contribute to the accumulation of R+D and, in so doing, it may contribute to economic growth.

In most of the studies that look at social capital, one of the main variables used is trust (Knack and Keefer, 1997; Whitely, 2000; Helliwell 1996; Roth, 2007; Berggren, Elinder & Jordahl, 2007; Dinda, 2008, Guisán, 2009, Neira, Vázquez y Portela (2009). The variable usually includes different types of trust or confidence, ranging from confidence in members of the family, neighbours, the people of one's country, etc. Other studies have group like proxy for social capital (Helliwell, 1996; Knack, 2003; Coates & Heckleman, 2003). While the trust or confidence shown in most studies as a positive variable for developing economies, being a member of a group may have positive or negative effects depending on the type of partnership which we are talking about.

In this work we have followed the proposed methodology at regional level, in line with works by Putnam, Leonardi & Nanetti (1993) about Italian regions; Beugelsdijk & Van Schaik (2001; 2005), Beugelsdijk & Smulders (2003; 2009), Lyon (2005), Hauser, Tappeiner, & Walde (2007), Akçomak & ter Weel (2008), Kaasa (2009). As a principal difference with these works we estimate the model through a panel data and, thus, we include measures of social capital in several years. This let us to develop an analysis along time and to view the influence of social capital in economic growth in a time period. In this work we use data on social capital of the years 2002, 2004 and 2006.

We analyze a production function as the following:

$$GDP_{it} = f(L_{it}, K_{it}, HK_{it}, SK_{it}, RD_{it},)$$

The variables that we use in order to do the estimation are:

L: LTECH: Annual data on employment in technology and knowledge-intensive sectors. Eurostat

K: Cap=VA-WS. Cap_{it} represents the gross capital stock in state i in year t ,

VA_{it} represents the total value added (output) of state i in year t

WS_{it} represents the total wages and salaries compensated for labour in state i in year t
Cambridge Econometrics and Eurostat

HK: Pupils and students in upper secondary and post-secondary non tertiary education (ISCED 3-4) by NUTS2 regions % population aged 15-24 years old. Eurostat

RD: PAT: High-tech patent applications to the EPO by priority year. Number of applications per million of inhabitants, Eurostat

GDPH: GDP per capital (base 2000). Eurostat

SK: ACTASOC: Worked in political party or action group last 12 months. European Social Survey

ASOC: Worked in another organization last 12 months European Social Survey

TRUST: Most people can be trusted or you can't be too careful. European Social Survey

Table 1: Results of estimation

Dependent Variable: log (GDPH)			
	Model (1)	Model (2)	Model (3)
Independent Variables (log)			
PAT	0.011**(0.005)	0.011**(0.005)	0.011**(0.005)
LTECH/LI	0.057*** (0.020)	0.056***(0.020)	0.0578**(0.020)
KH	0.054**(0.020)	0.058*** (0.024)	0.054**(0.024)
TRUST	0.001 (0.021)		
ACTASOC (%)		0.122 (0.1610)	
Pat*ACTASOC			0.013 (0.062)
Method	FE N: 230 R2:0.99		

Notes: (Years 2002-2004-2006-2008, European regions) *<0.1, **<0.05,***<0.01 FE: Fixed Effects: cross-section and period (Redundant Fixed Effects Testing: reject)

Dependent Variable: PAT/LI			
	Model (4)	Model (5)	Model (6)
Independent Variables (log) . N:230			
PAT			
LTECH/LI	0.411*** (0.107)	0.186*** (0.030)	0.222*** (0.025)
KH	2.197*** (0.378)	1.762*** (0.128)	1.625*** (0.100)
TRUST			0.9146*** (0.0987)
ACTASOC(%)	17.834*** (4.143)	2.748*** (4.143)	
GDP/LI		2.046*** (0.045)	1.737*** (0.052)
Method	MCO	MCG	MCG
R2	0.290114	0,67	0,68

Notes: (Years 2002-2004-2006-2008, European regions) *<0.1, **<0.05,***<0.01

FE: Fixed Effects: cross-section and period (Redundant Fixed Effects Testing: reject)

The estimation results indicate a significant positive effect of employment relate to technology and patents on the growth of GDP per capita.

Regarding social capital, although there was a positive effect, the social capital variables are not significant. However and as occurs in the works of Beugelsdijk & van Schaik (2001; 2005), Hauser et al (2007) or Kaasa (2009) the effect is greater for the networks than the trust.

In Viera, E.; Vázquez, E.; Neira, I; (2010) obtain in their results that the activities of innovation, measured by the expenditure in R&D, are positively related to labour productivity in European regions. Likewise, we believe that this positive influence has an exponential effect in long term labour productivity, since the return of the investments is not immediate, and takes place in the medium to long term, a return that ultimately enhances the competitiveness of the regional economy

Akçomak & ter Weel (2008), that they use trust as a social capital variable in order to analyze the relationship between social capital, innovation and income per capita growth; or Kaasa (2009) who investigates how different dimensions of social capital influence a region's innovative activity measured by patent application. In this line, models 4 to 6 present results that show us a positive effect of capital variables on innovation. So, it is possible to consider regional social capital, both at through trust and networks, as an enhancer element of regional innovative activity.

Conclusions

As depends on the work in the field of innovation in this paper demonstrates the positive and significant relationship between innovation variables and economic development. Moreover, social capital variables constitute, along with human capital, a basic pillar in regional development, but the econometric results obtained are not conclusive in this subject.

In this work we have perform cross-section estimations where social capital was significant. The small sample size, as well as the greater robustness of the results using a panel data has led us to select this approach. However the results obtained still have some estimation problems due to gaps in the samples; this is one of the objectives of current debugging work. So here are some action lines, waiting for the suggestions in this and other areas.

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