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# Social capital and growth in European regions: an empirical test

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## Abstract

We study a cross section of 54 European regions. The central question is whether regional differences in economic growth are related to social capital, in the form of generalized trust and associational activity. Substantiated by extensive robustness tests, we present evidence that growth differentials in European regions are positively related to social capital measured as associational activity. Hence, our results suggest that the thesis of Putnam et al. (1993) thesis on social capital in Italian regions can be generalized. Our analysis also suggests that it is not the mere existence of network relationships that stimulates regional economic growth, but active involvement in these relationships.

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## 1. Introduction

Economists show an increased interest in the role of social capital in relation to economic development. Building on the pioneering work of Kormendi and Meguire (1985), Baumol (1986), Grier and Tullock (1989), Barro (1991) and Mankiw et al.

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(1992), growth empirics has turned to the role of institutions and culture (Temple, 1999; Temple and Johnson, 1998), presently crystallizing around the concept of social capital (see, e.g., Durlauf, 2002a for an introduction to a symposium on social capital in *The Economic Journal*). Although the way economists use the concept can be criticized (Fine, 2001), social capital is probably one of the most successfully introduced ‘new’ concepts in economics the last decade.

An influential contribution to the discussion on the relation between economic development and social capital is the publication of “Making democracy work” by Putnam et al. (1993). These authors study Italian regions and find that social capital matters in explaining the regional differences in economic and institutional (government) performance. Putnam et al. (1993, p. 167) define social capital as those ‘features of social organisation, such as trust, norms, and networks, that can improve the efficiency of society by facilitating co-ordinated actions’. The World Bank uses a similar definition. According to the World Bank, social capital refers to the norms and networks that enable collective action. It refers to the institutions, relationships and norms that shape the quality and quantity of a society’s social interactions.<sup>1</sup>

In addition to standard economic variables, social capital is considered an important factor in explaining economic success, a statement that we choose to refer to as the Putnam hypothesis. Besides Putnam et al. (1993), Fukuyama (1995a) has emphasized the importance of social capital. He argues that social capital in the form of nonfamily or generalized trust is of crucial importance for successful performance in advanced economies. As becomes clear in Putnam et al.’s definition of social capital, trust and networks are seen as dimensions of social capital. Where Putnam et al. stress the role of networks, Fukuyama stresses the role of trust.

A number of studies have appeared on the concept of social capital since then (Fukuyama, 1995b; Granato et al., 1996; Helliwell, 1996; Swank, 1996; Inglehart, 1997; Knack and Keefer, 1997; Fedderke et al., 1999; Paxton, 1999, 2002; Van Deth et al., 1999; Inkeles, 2000; Paldam and Svendsen, 2000; Putnam, 2000; Temple, 2001; Zak and Knack, 2001; Durlauf, 2002a,b,c; Francois, 2002; Piazza-Georgi, 2002). However, empirical studies that focus on the question of whether the Putnam hypothesis can be generalized are scarce. Although the concept of social capital is intuitively highly appealing, it is hard to measure it empirically, and there is little systematic *quantitative* evidence on social capital (Paldam and Svendsen, 2000). Moreover, as Woolcock (1998) puts it, vagueness has plagued social capital scholarship. There are a number of concepts that are used in similar ways as social capital, like social infrastructure (Hall and Jones, 1999) and social capability (Abramovitz, 1986; Temple and Johnson, 1998). The indicators used in the literature on social capital are often trust and associational activity.

This paper presents an analysis of the relation between economic growth and social capital for European regions. We build on two strands of literature, i.e., the explanation of regional growth differentials in Europe as developed by Barro and Sala-I-Martin (1995) and Knack and Keefer’s (1997) discussion on the economic payoff of social

<sup>1</sup> See <http://www.worldbank.org/poverty/scapital/>.

capital. By doing so, we are able to test Putnam et al.'s hypothesis on an analogous subnational level used in their study.<sup>2</sup> Thus, the core question of this paper is whether Putnam et al.'s (1993) study on Italian regions can be generalized. The data we use to measure social capital at the regional level in Europe are taken from the *European Values Studies* (1990). These data are unique in the sense they allow us to calculate regional scores of social capital. Following the standard empirical growth models as developed by Barro (1991), we test if growth differentials in European regions are related to social capital proxied by generalized trust and associational activity (group membership). Substantiated by extensive robustness analysis, our study has two major findings. First, we do not find that on a regional level, growth is related to trust. Second, regional economic growth is positively related to associational activity and in specific active—unpaid—voluntary work. We distinguish between passive and active group membership, the latter referring to doing unpaid voluntary work for all kinds of civic associations. Our robustness analysis suggests that growth is not so much related to passive group membership, as to active group membership.

The outline of the paper is as follows. First, we summarize theory on social capital and how it is perceived in the literature. Thereby, we focus on trust and group membership. We argue that trust fulfils different functions at different stages of economic development. Besides, as a substitute for a well-functioning institutional system, trust can be seen as a necessary element in complex transactions with incomplete contracts. The second element of social capital we discuss is group membership. Then, we turn to our empirical analyses, and test if trust and (passive and active) group membership are related to regional economic growth in a cross section of 54 western European regions. After a robustness analysis, we conclude with a discussion on our indicators for social capital and provide suggestions for further research.

## **2. Theory on social capital: trust and associational activity**

The literature on trust is extensive.<sup>3</sup> Here, we only summarize the main insights relevant for our empirical test of the relation between growth and social capital in European regions. In general, trust can be seen as the perception and interpretation of the other's expected dependability. Trust is the mutual expectation that arises within a community of regular, cooperative behavior, based on commonly shared norms (Paldam and Svendsen, 2000, p. 342). As Zaheer et al. (1998) summarize, the concept of trust may be framed as an expectation of a partner's reliability with regard to his obligations, predictability of behavior, and fairness in actions and negotiations while faced with the

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<sup>2</sup> There is small difference however. Putnam et al. analyze regions on a different level than we do. Where we use the NUTS1 level (resulting in 11 Italian regions), Putnam et al. apply another definition resulting in 20 regions. In line with Putnam et al. we study subunits of a country.

<sup>3</sup> As a result, numerous typologies and definitions of trust have been developed. The adjectives used in this literature often refer to the source of trust. For example, knowledge-based trust refers to the fact the behavior of the other is predictable because one knows the other either from own experience or through reputation effects arising in networks. We refer to Nooteboom (2002) for an excellent overview of the trust literature.

possibility to behave opportunistically. It has to do with signalling that the actor will not play one-shot games and behave opportunistically (cf. [Gambetta, 1988](#)).

Several authors have shown the importance of trust in economic transactions. These studies can be seen as an extension of [Williamson's \(1975, 1985, 1998\)](#) transaction cost theory. [Ring and Van de Ven \(1992\)](#) have shown that informal, personal connections between and across organizations play an important role in determining the governance structures used to organize their transactions. [Gulati \(1995\)](#) pointed to the fact that both transaction cost elements as well as social factors are relevant and important in studying interfirm relationships and co-operation. Repeated ties between firms engender trust that is manifested in the form of the contracts used to organize subsequent alliances. Trust and the associated information flow within social networks provide options for control through third parties and serve therefore as a substitute for a legal system. This function is related to the reduction of transaction costs, or the costs of running the economic system. Moreover, trust is linked with the facilitation of highly uncertain and complex transactions. It reduces the uncertainty of these kinds of transactions.

[Uzzi \(1996\)](#) shows in a study on the apparel industry in New York that trust facilitates the exchange of resources and information that are crucial for high performance but are difficult to value and transfer via market ties. This second function of trust is related to its information function. As [Malecki \(2000, p. 195\)](#) puts it, ‘through the economic and social relationship in the network, diverse information becomes inexpensive to obtain’. When discussing alliances, [Gulati \(1998, p. 308\)](#) argues that ‘trust not only enables greater exchange of information, but it also promotes ease of interaction and a flexible orientation on the part of each partner’. It operates as a mechanism that facilitates communication and co-operation between firms. For example, trust relationships can result in a supplier exceeding contractual requirements, whether by early delivery, higher quality, or some other means of assuring goodwill ([Sako, 1992](#)). Or as [Williamson \(1985, p. 62\)](#) states, ‘where personal integrity is believed to be operative, individuals [...] may refuse to be part of opportunistic efforts to take advantage of the letter of the contract when the spirit of the exchange is emasculated’. [Nooteboom \(1999\)](#) even reasons that too detailed and formal contracts may seriously inhibit the growth of trust. Trust and contractual safeguards are to some degree substitutes. Among those who see trust as a substitute for rules and contracts, [Kenneth Arrow \(1971, p. 22\)](#) is perhaps the most explicit:

“It is useful for individuals to have some trust in each other’s word. In the absence of trust, it would become very costly to arrange for *alternative sanctions* and *guarantees*, and many opportunities for mutually beneficial co-operation would have to be foregone” (emphasis added).

According to [Fukuyama \(1995a\)](#), societies endowed with generalized trust enjoy a form of social capital, that—complementary to traditional factor endowments like labor and capital—contributes at least as much to their success in modern economic competition. Generalized trust is based on a set of ethical habits and reciprocal moral obligations internalized by members of a community ([Fukuyama, 1995a](#)). High trust societies can make do with fewer regulations and coercive enforcement mechanisms. In this view, trust is seen as a substitute for contracts. But when an institutional system functions properly, the function of trust should be seen in the light of the facilitation of complex transactions.

It lowers transaction costs and moreover, it contributes to flexibility. Fukuyama argues that nonfamily or generalized trust is therefore of importance for successful performance in advanced economies. Trust allows for co-operation without the direct influence of power and market. Thus, trust not only serves as a substitute for legal systems, but also functions as a facilitator of complex transactions that even in case of a well-functioning institutional system cannot be fully ‘arranged’ in terms of contracts. In other words, even in the presence of well-functioning institutions, some transactions would be almost impossible in the absence of trust.

### *2.1. Associational activity*

Regarding the function of associational activity and its link to economic growth, theory is less clear than with respect to trust (Bertrand et al., 2000). Putnam et al. (1993) argue that network relationships improve the efficiency of society by facilitating coordinated actions. Their study on Italian regions has shown that the critical factor in explaining effectiveness of regional governments and regional economic performance in Italy is to be found in regional differences in social structure. Effective governance hinges critically on traditions of civic engagement and the structure of the civic networks. In regions where social relationships are more horizontal, based on trust and shared values, participation in social organizations is higher and social capital is higher. They conclude that regions, in which the regional government is more successful and the economy is more efficient, are characterized by horizontal relations that both favored and fostered greater networks of civic engagement and levels of organization in society. The reason Putnam et al. specifically study the degree of civic community membership is that ‘Citizens in a civic community, though not selfless saints, regard the public domain as more than a battleground for pursuing personal interest’ (Putnam et al., 1993, p. 88). In this way, fewer resources are used incurring transaction costs. Or as Leonardi (1995, p. 169) writes, high social capital means that citizens accept the positive role played by collective action (organized group behavior) in pursuing collective goods.

Referring to the work of Alexis de Tocqueville (1969), Putnam maintains that civil associations contribute to the effectiveness and stability of democratic government, because of their ‘internal’ effects on individual members and their ‘external’ effects on the wider polity. According to Putnam, ‘associations instill in their members a habit of cooperation, solidarity and public-spiritedness.[...] Participation in civic organizations inculcates skills of cooperation as well as a sense of shared responsibility for collective endeavors. Moreover, when individuals belong to “cross-cutting” groups with diverse goals and members, their attitudes will tend to moderate as a result of groups interaction and cross-pressures’ (Putnam et al., 1993, pp. 89–90). Externally, a dense network of associations may enhance ‘interest articulation’ and ‘interest aggregation’, thereby contributing to effective social collaboration.

According to Putnam, effective norms of generalized reciprocity are bolstered by these dense networks of social exchange (Putnam, 2000, pp. 136/172). Through reputation effects, honesty is encouraged by dense social networks. As has been shown using a game theoretical approach, the prospects for conformism in groups

depends on the nature of interaction and the degree of integration (Bala and Goyal, 2001). ‘Social networks allow trust to become transitive and spread: I trust you, because I trust her and she assures me that she trusts you’ (Putnam et al., 1993, p. 169). Trust lubricates cooperation. The greater the level of trust in a society, the greater the likelihood of cooperation. And cooperation itself breeds trust. And exactly, this steady accumulation of social capital has been a crucial part of the story behind the virtuous circles of civic Italy according to Putnam et al. (1993). As Putnam (2000) writes, people who trust others are generally more engaged in civic life and build more social capital than the people who distrust. Conversely, the socially disengaged believe themselves to be surrounded by miscreants and feel less constrained to be honest themselves. However, as Putnam admits himself, the causal arrows among civic involvement, reciprocity, honesty and trust are as ‘tangled as well-tossed spaghetti’ (Putnam, 2000, p. 137).

### 3. Empirical analysis

In order to test whether social capital influences regional economic growth, we investigate 54 European regions. By doing so, we are able to test if Putnam’s thesis on social capital based on Italian regions can be generalized. In addition, there are other advantages of investigating regions in Europe. First of all, the set of regions is relatively homogeneous compared with studies on culture and economic development that incorporate countries, like Taiwan and Germany or Japan and the United States, in the same regression analysis. Temple’s (1999) critical comment that countries differing widely in social, political and institutional characteristics are unlikely to fall on a common surface, is heeded by taking this relatively homogeneous set of European regions. This is especially relevant since it has been shown that countries may differ in terms of relevant proxies for social capital (Danielson and Holm, 2003; Uslaner, 1997).<sup>4</sup> A second advantage of studying regions is the number of observations. Instead of only 29 countries (e.g., Knack and Keefer, 1997), we study 54 regions. Most important, however, is the fact that by comparing *national* cultures, ‘we risk losing track of the enormous diversity found within many of the major nations of the world’ (Smith and Bond, 1998, p. 41). By studying regions and regional differences, this risk is limited.

#### 3.1. Social capital data

Data on social capital are taken from the *European Values Studies* (1990), which is a survey on norms and values. The European Values Study (EVS) is a large-scale, cross-national and longitudinal survey research program on basic human values, initiated by the European Value Systems Study Group (EVSSG) in the late 1970s. The EVS aimed at designing and conducting a major empirical study of the moral and social values underlying European social and political institutions and governing conduct. Its

<sup>4</sup> We are grateful to one of the referees for pointing this out.

coordination centre is located at Tilburg University, The Netherlands.<sup>5</sup> By now, the survey comprises three waves (1981/1990/1999), of which we use the second one. In order to obtain regional scores on our indicators of social capital, we had to regroup the original individual data. We could not use the first wave that was carried out in 1981, because we could not trace the individual scores in terms of regions. Moreover, we want to use indicators of social capital that date back to the starting point of our period of analysis as much as possible. Therefore, we use the 1990 data. The set comprises seven countries, i.e., France, Italy, Germany, Spain, The Netherlands, Belgium and the United Kingdom. In order to compare the data on norms and values with regional economic data, we used the Eurostat definition of regions. The regional level in our analyses is the NUTS1 level. This implies that France consists of 8 regions, Italy 11, Germany 11 (former eastern regions excluded), Spain 7, The Netherlands 4, Belgium 3 and the UK 10 (including Scotland, excluding Northern Ireland). The total number of regions equals 54 (see Fig. 1). The numbers of the European regions are defined in Table 1.

### *3.1.1. Trust*

For both trust and group membership, we take standard measures as in Knack and Keefer (1997). The question we used to assess the level of trust in a society is: “Generally speaking, would you say that most people can be trusted, or that you cannot be too careful in dealing with people?”. After deleting the number of respondents that answered “don’t know”, we took the fraction of people that answered “most people can be trusted”.

For our sample of 54 regions, we have obtained scores on trust. These scores range from 5.5% of the respondents answering that most people can be trusted in Sardegna in Southern Italy to 64.6% in the eastern part of the Netherlands. As reported in Table 2, mean score equals 0.35 with a standard deviation of 0.11. In Fig. 2, the scores on percentage of people answering that most people can be trusted are shown.

As can be seen in Fig. 2, the regional scores on trust differ considerably within Europe. When looking at countries, we see, for example, that The Netherlands are rather homogeneous in terms of trust, but regions in Italy differ a lot. Putnam et al. (1993) seemed right in the case of Italy, when describing the differences between the Northern and the Southern regions. The North has higher scores on trust than the South. However, at first sight, such a picture for Europe as a whole cannot be obtained. While some researchers have suggested that religion, especially Protestantism, correlates (positively) with trust (e.g., Inglehart 1990; Knack and Keefer, 1997, p. 1283), our regional analysis suggests this is not the case. Traditional Catholic regions in the South of the Netherlands, Flanders, Madrid and the North of Italy all fall in the group of regions that have the highest scores on trust (0.447–0.646), far above average (see Fig. 2).

### *3.1.2. Group membership*

Similar to Knack and Keefer (1997), we measure associational activity by the average number of civic groups cited per respondent in each region. However, as Knack and

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<sup>5</sup> Details regarding the sample size, response rate, the survey questions and the procedures followed to obtain nonculturally biased estimates (e.g., backward translation procedures), are discussed at the website <http://www.uvt.nl/evs>.

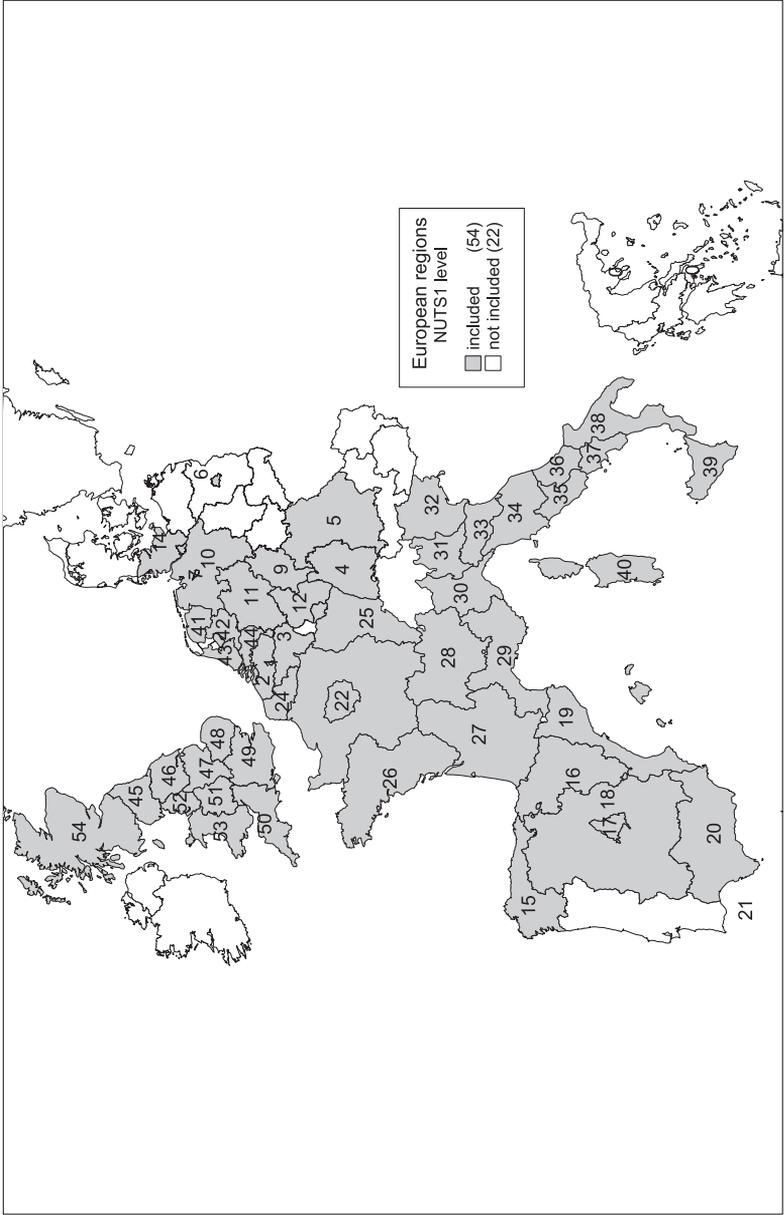


Fig. 1. Map of European regions.

Table 1  
Data for European regions

	Region	NUTS1 code		Region	NUTS 1 code
1	Reg. Bruxelles-Cap.	BE1	28	Centre-Est	FR7
2	Vlaanderen	BE2	29	Méditerranée	FR8
3	Wallonie	BE3	30	Nord Ovest	IT1
4	Baden-Württemberg	DE1	31	Lombardia	IT2
5	Bayern	DE2	32	Nord Est	IT3
6	Berlin	DE3	33	Emilia-Romagna	IT4
7	Bremen	DE5	34	Centro	IT5
8	Hamburg	DE6	35	Lazio	IT6
9	Hessen	DE7	36	Ambruzzo-Molise	IT7
10	Niedersachsen	DE9	37	Campania	IT8
11	Nordrhein-Westfalen	DEA	38	Sud	IT9
12	Rheinland-Pfalz	DEB	39	Sicilia	ITA
13	Saarland	DEC	40	Sardegna	ITB
14	Schleswig-Holstein	DEF	41	Noord-Nederland	NL1
15	Noroeste	ES1	42	Oost-Nederland	NL2
16	Noreste	ES2	43	West-Nederland	NL3
17	Madrid	ES3	44	Zuid-Nederland	NL4
18	Centro	ES4	45	North	UK1
19	Este	ES5	46	Yorkshire and Humberside	UK2
20	Sur	ES6	47	East Midlands	UK3
21	Canarias	ES7	48	East Anglia	UK4
22	Île de France	FR1	49	South East	UK5
23	Bassin Parisien	FR2	50	South West	UK6
24	Nord-Pas-de-Calais	FR3	51	West Midlands	UK7
25	Est	FR4	52	North West	UK8
26	Ouest	FR5	53	Wales	UK9
27	Sud-Ouest	FR6	54	Scotland	UKA

Keefe also argue, the level of involvement is not measured, which may reduce the validity of this measure of social capital. The hypothesized benefits of network embeddedness may not be captured when taking passive membership of groups and associations. Therefore, we have decided to measure active membership of a number of associations next to our measure of passive membership. The categories are:

Table 2  
Descriptive statistics

	Mean	Standard deviation
Trust	0.35	0.11
Putnam groups	0.26	0.18
Olson groups	0.22	0.12
Active group membership	0.41	0.17
Passive group membership	0.62	0.38
Investment	24.25	3.74
Schooling	0.51	0.067

*N*=54.

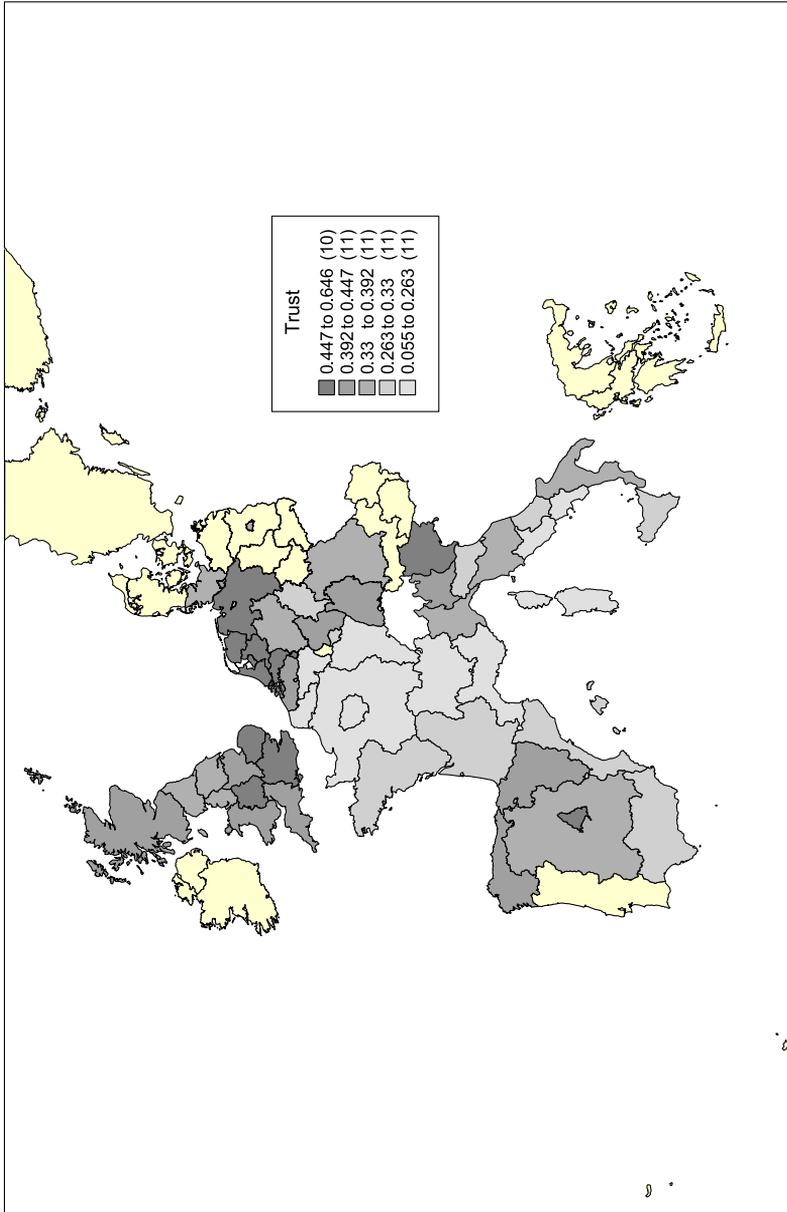


Fig. 2. Trust scores at NUTS1 level in Europe.

- (a) Social welfare services for elderly handicapped or deprived people
- (b) Religious or church organizations
- (c) Education, arts, music or cultural activities
- (d) Trade unions
- (e) Political parties or groups
- (f) Local community action
- (g) Third world development or human rights
- (h) Conservation, the environment, ecology
- (i) Professional associations
- (j) Youth work
- (k) Sports or recreation
- (l) Women's groups
- (m) Peace movement
- (n) Animal rights
- (o) Voluntary organizations concerned with health

The above categories are the same for our measures of passive and active group membership. The difference between the two is that in case of active membership, respondents are not only a member but also do voluntary work for the particular association. The scores are obtained by taking the average score per region of respondents answering yes to the question if they belong to (one or more of) the abovementioned associations.<sup>6</sup>

Besides the difference between active and passive group membership, we distinguish between types of group membership. We follow Knack and Keefer's distinction between different types of associational activity that may have different effects on growth. In line with their analysis, we make a distinction between the so-called Putnam and Olson groups. As already discussed, Putnam et al. (1993) argued that the economic success of northern Italian regions can be attributed to its richer associational life, because associations 'instill in their members habits of cooperation, solidarity, and public-spiritedness' (1993, p. 89). Olson (1982), on the other hand, observes that associational activity may hurt growth because of rent-seeking activities. According to Olson, many of these associations may act as special interest groups lobbying for preferential policies that impose disproportionate costs on society (see also Knack and Keefer, 1997). In sum, whereas Putnam groups may be evoking positive effects, these may be reduced by harmful effects of the Olson groups.

We have calculated regional scores on the Putnam and Olson groups corresponding to Knack and Keefer's analysis at a country level. The Putnam groups refer to (passive) membership of (b) religious organizations, (c) education, arts, music or cultural activities and (j) youth work. The Olson groups consist of membership of (d) trade unions, (e) political parties of groups and (i) professional associations. For reasons of clarity, we depicted an overview of the different measures of social capital in Fig. 3.

Figs. 4 and 5 show the scores on the Putnam and Olson Groups, respectively. The mean score on the Putnam groups at the regional level is 0.26. The highest score is

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<sup>6</sup> Note that Knack and Keefer (1997) have fewer types of associations included in their measure of group membership, because of lack of data. In addition to the associations they analyze, we include items k, l, m, n and o.

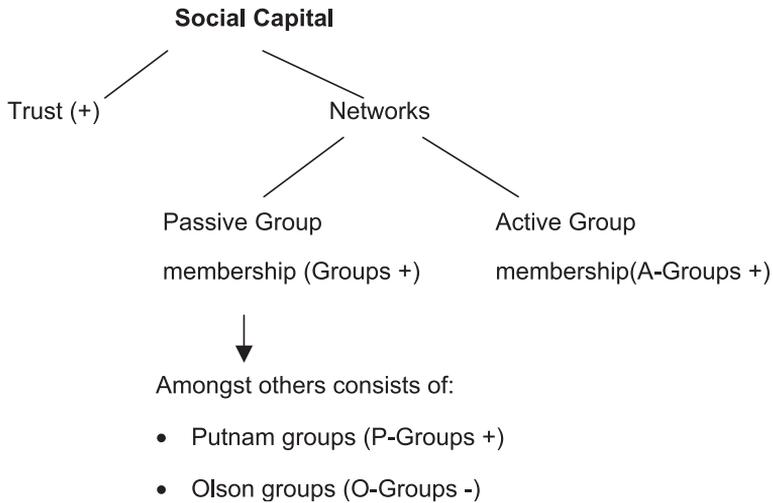


Fig. 3. An overview of the different measures of social capital (+ or – indicates direction of hypothesized relationship with regional economic growth).

found in the eastern part of the Netherlands, with a score of 0.89. This implies that, on average, 89% of people are members of at least one of the organizations included in the Putnam groups. The lowest score can be found in Sardegna, Italy, where only 3% of the people are member of at least one of these organizations. The scores on the Olson groups range from 0 in Sardegna (Italy) to 0.55 in the eastern part of the Netherlands. The mean value is 0.22.

Regarding the question on unpaid voluntary work (active group membership), we obtained an average score of 0.41. Fig. 6 shows the regional scores on active group membership. The highest score is obtained in Bremen, Germany (0.82) and the lowest score on active membership can be found in Sardegna (0.08). Due to the limited fraction of people doing unpaid voluntary work when splitting up total active membership in Putnam and Olson groups, we can only make this distinction for passive group membership.

### 3.2. Economic data

In order to test if economic growth is related to trust and group membership, we have taken a standard growth framework that corresponds with Knack and Keefer’s empirical test, and which includes initial level of GDP per capita, the investment ratio and the school enrolment ratio. We closely follow Barro and Sala-I-Martin (1995) who explain regional growth differentials in Europe between 1950 and 1990. As we have more recent economic data, we analyze the period 1950–1998. In the robustness analysis, we test for changes in the growth period.

As the availability of data on the level of European regions is relatively scarce, the number of empirical studies is rather limited compared to cross-country studies. Similar to Barro and Sala-I-Martin (1995), we have computed regional growth differentials by relating the regional GDP per capita information to the country

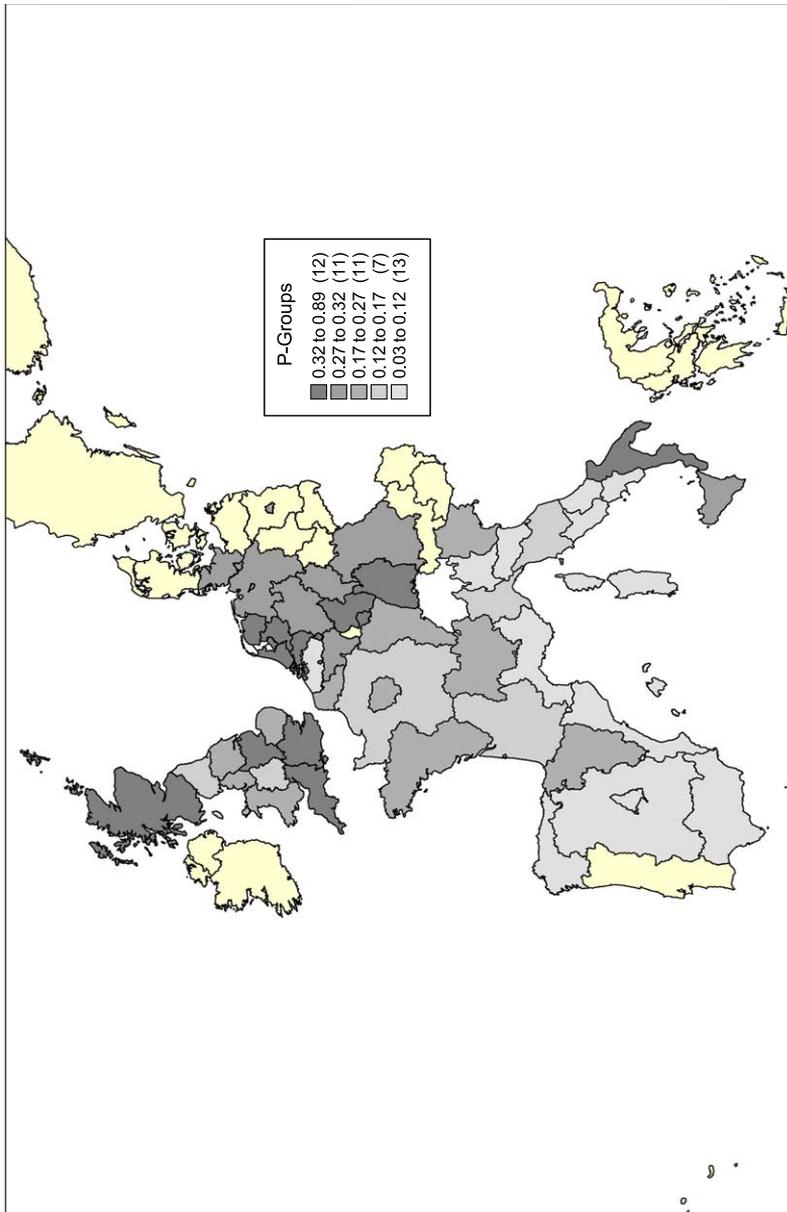


Fig. 4. Regional scores on Putnam groups in Europe.

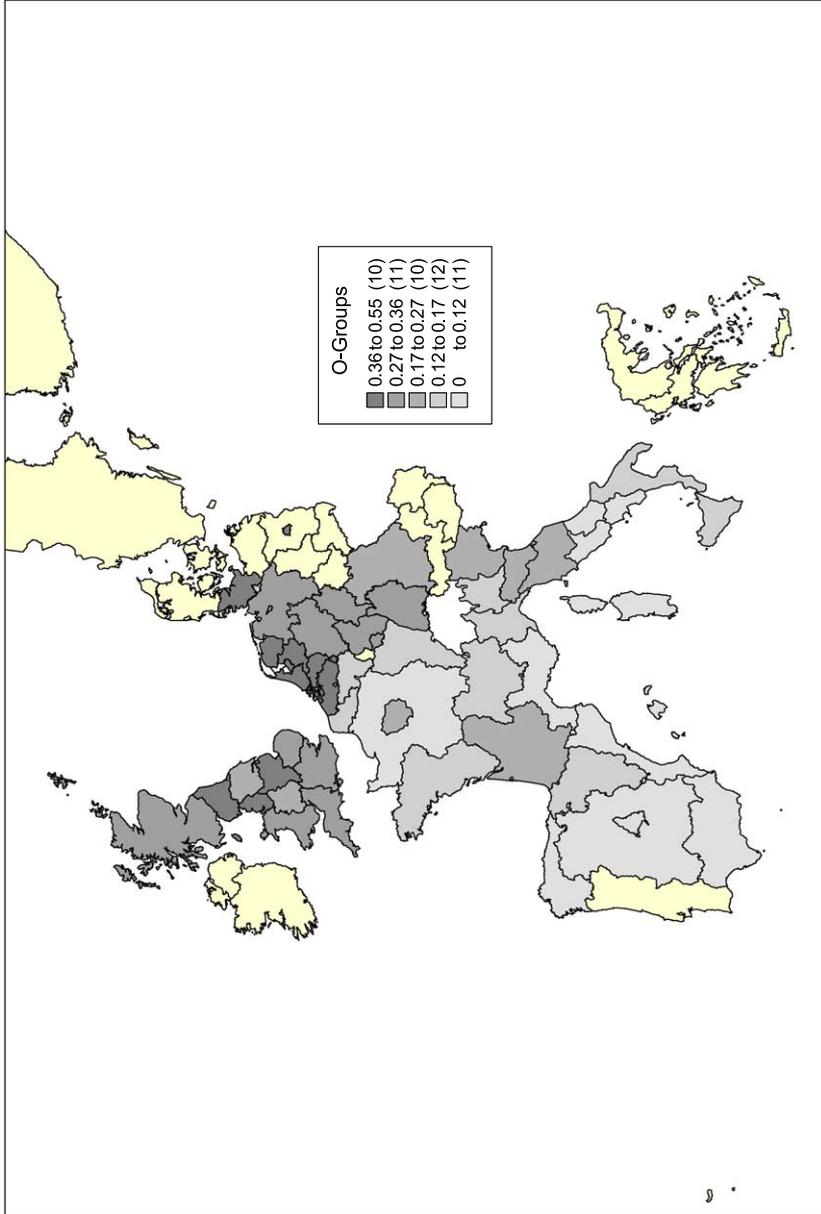


Fig. 5. Regional scores on Olson groups in Europe.

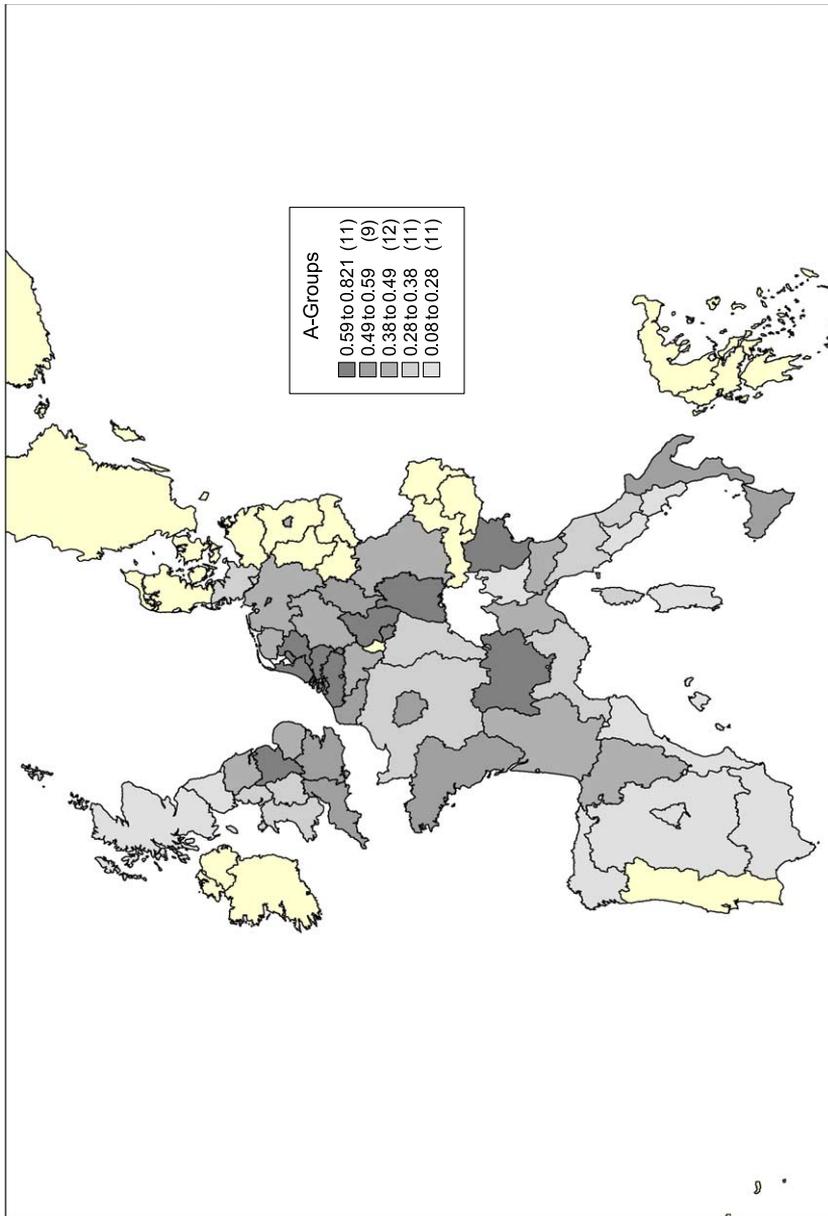


Fig. 6. Regional scores on active group membership in Europe.

mean.<sup>7</sup> There are two reasons to use the country mean as a correction factor. First of all, we do not have regional price data. Second, the figures on regional GDP are provided in an index form that is not comparable across countries. Hence, we have used Gross Regional Product (GRP) figures that are expressed as deviations from the means from the respective countries. An additional advantage of using relative data versus nonrelative data is the direct control for national growth rates that might bias regional growth rates. The 1950 data are based on [Molle et al. \(1980\)](#), whereas the data for Spain refer to 1955 and are based on [Barro and Sala-I-Martin's \(1995\)](#) calculations. The 1998 data on GRP are drawn from Eurostat information.

Due to unavailability of reliable regional investment data,<sup>8</sup> the investment ratio is measured at country level. Data are taken from the Penn World Tables. The period for which we have calculated the average of the investment ratio is 1950–1998. Data limitations at the regional level do not enable us to measure the school enrolment ratio as some average over time, but there are data on the total number of pupils at first and second level in 1977, divided by total number of people in the corresponding age group. The basic growth period we analyze is 1950–1998. The school enrolment rate in 1977 falls in between these dates and given the fact that school enrolment rates have increased since 1950, the 1977 information may be a reasonable proxy for the average over the entire period. Data come from Eurostat. Data on school enrolment rates in Spanish regions refer to 1985. We have taken uncorrected regional figures because it has been shown that migration plays only a minor role in European regions and the relation with per capita GDP is weak ([Barro and Sala-I-Martin, 1995](#); [Begg, 1995](#)).

### 3.3. Regression analysis

The basis for our analyses is the standard ‘Barro’ type of a growth regression, including the investment in physical capital, human capital and the initial level of economic development. In order to control for concentration of human capital in major agglomerations, we included a variable that consists of the score on the school enrolment rate multiplied by a dummy variable for the region in which a major agglomeration is located.<sup>9</sup> Furthermore, we tested if spatial correlation influences our results. Ideally, one should use interregional input–output tables to calculate regional multipliers and construct a variable that controls for spatial correlation.<sup>10</sup> However, this information was not available. In order to control for spatial correlation, we applied [Quah's \(1996\)](#) approach and calculated the so-called neighbor relative income. This method implies that we use

<sup>7</sup> Gross Regional Product of a region in 1950 is divided by the mean of the Gross Regional Products of all regions belonging to a certain country. A similar formula is applied to calculate the 1998 relative regional product. Regional growth over the period 1950–1998 is then based on these two indices.

<sup>8</sup> Eurostat and Cambridge Econometrics do provide data on Gross Fixed Capital Formation. However, data are incomplete for some countries or in time.

<sup>9</sup> We selected the Western part of the Netherlands, Greater Paris, Greater Berlin, Greater London, Barcelona area, Brussels and the Italian region Lazio (Rome).

<sup>10</sup> There exist other ways to have a more refined control variable that can be taken into consideration, for example, the physical length of abutting boundaries or the physical characteristics of the border terrain. However, these kinds of extensions go beyond the scope of the current paper.

Table 3  
Regression results

Social capital and regional economic growth, 1950–1998										
Model	1		2		3		4		5	
Dependent variable	Growth 1950–1998									
Constant	-1.44	(0.749)	-1.45**	(0.757)	-1.49**	(0.506)	-1.37*	(0.582)	-1.01	(0.631)
Initial level of GRP per capita	-0.971**	(0.059)	-0.968**	(0.059)	-0.938**	(0.079)	-0.942**	(0.063)	-0.969**	(0.049)
Investment	0.476	(0.264)	0.481	(0.268)	0.553**	(0.176)	0.484*	(0.205)	0.422*	(0.214)
Schooling	0.527*	(0.267)	0.518	(0.277)	0.397	(0.208)	0.449*	(0.207)	0.569**	(0.208)
Agglomeration	0.528**	(0.164)	0.522**	(0.161)	0.423*	(0.205)	0.404**	(0.191)	0.472**	(0.154)
Spatial spillover	0.308**	(0.091)	0.301**	(0.086)	0.213*	(0.095)	0.233**	(0.085)	0.245**	(0.074)
Trust			0.011	(0.041)						
Putnam groups					-0.007	(0.086)				
Olson groups					0.119	(0.065)				
Passive group membership							0.109**	(0.048)		
Active group membership									0.175**	(0.046)
R <sup>2</sup>	0.4089		0.4090		0.4673		0.4641		0.4813	

Country-based cluster adjusted standard errors between parentheses. *N*=54.

\* *p*<0.1.

\*\* *p*<0.05.

average per capita income of the surrounding, physically contiguous regions to control for spatial autocorrelation. In our sample, however, the GRP data are related to national average and therefore reflect regional GDP per capita relative to country mean. By using these data, we implicitly assume that scores for neighboring regions in foreign countries influence regional growth if the GRP per capita in this neighboring region is relatively high compared to their own national average.<sup>11</sup>

Hence, our basic regression analysis includes initial level of GRP per capita, school enrolment rate, investment ratio, and the control variables for spatial correlation and the concentration of human capital in agglomerations. We have taken log specifications for all variables except the two control variables. Moreover, we control for country-specific effects. We apply three methods to control for country specific effects. In the basic estimations presented in Table 3, we use weighted least squares, where regional standard errors are adjusted on the basis of belonging to the same country. This cluster adjusted standard error method is an extension of White’s heteroskedasticity consistent standard errors, where standard errors are corrected for dependence within (in this case) countries. Cluster-based adjusted standard errors basically correspond to random effects, and using dummies would be a fixed effect estimator. In the robustness analysis in the next section, we have checked for alternative methods, like directly including country dummies (fixed effects) and the quasi-fixed effects approach (Hsiao, 1986).

<sup>11</sup> Of the 54 regions in the sample, 19 have neighboring regions in countries other than the region’s own host itself, whereas 4 had no neighboring regions at all. In the latter case, no spatial autocorrelation is measured. The average number of physical neighbour regions is 3.3, which corresponds with Quah’s score of 3.3.

The first model we estimate is the standard growth model. As the results in [Table 3](#) show, all variables except for Investment are significant. This result is not surprising given our control for country-specific effects and the fact that the investment ratio is measured at country level. Schooling is significant at the 10% level. Regional economic growth is negatively related to the initial level of GRP per capita. This corresponds with other findings on regional convergence in Europe ([Martin and Sunley, 1998](#)). However, if we take shorter periods of time (e.g., 1984–1998), we cannot find proof for the convergence hypothesis. This corresponds with findings on country ([Levine and Renelt, 1992](#)) and regional level ([Fagerberg and Verspagen, 1995](#)). The period in the 1980s can be roughly characterized by divergence instead of the observed convergence in the period before ([Maurseth, 2001](#)). However, based on our sample, we conclude that for the overall after-war period, the growth rate of per capita GRP is negatively related to the starting level of per capita GRP.

To test the hypothesized positive relation between economic growth and social capital, we included social capital variables discussed above. First, as shown in the second model in [Table 3](#), we added the scores on generalized trust. Growth is not significantly related to trust. In the third model, we included group membership. In accordance with [Knack and Keefer \(1997\)](#), we split up this variable into two subgroups, namely, Olson groups and Putnam groups, as defined in Section 3.1.2. As can be seen in [Table 3](#), both Putnam and Olson groups are not significant. In the fourth model, we include the measure for passive group membership. Regional growth rates are significantly and positively related to passive group membership. In the final model, we included the variable that indicates active membership. This is highly significant and as a consequence, the resulting model has the highest variance explained. Based on the estimated coefficients in [Table 3](#), it can be calculated that a one standard deviation change in active membership raises growth by .03 percentage points. The question is whether the above findings are robust.

#### 4. Robustness analysis

In order to test if the above findings are robust, we performed several tests. [Table 4](#) provides the results of these tests for the estimated social capital variables trust, the Putnam and Olson groups and passive and active group membership. For each model specification, we show the estimated coefficient and its standard error. The default model is the one presented in [Table 3](#). The modifications are described in detail below and refer to the first column of [Table 4](#).

First, as already mentioned, we apply different methods to control for country-specific effects. In [Table 3](#), we estimate with cluster adjusted standard errors. The use of country-based adjusted standard errors may yield inconsistent estimates, if the unobserved variables affecting growth are correlated with observed characteristics (cf. [Greene, 2003](#)). Therefore, as an additional test, we parametrized this relationship by entering country averages of our social capital variables as additional variables. This specification is often referred to as a quasi-fixed effect model ([Hsiao, 1986](#)). Therefore, in our robustness analysis, we use a fixed effects (country dummies) and quasi-fixed effects estimator. In [Table 4](#), we report results when using these alternative methods. When using country

Table 4  
Robustness tests

Social capital variable; Type of change	Model 2: Trust	Model 3: Putnam groups	Model 3: Olson groups	Model 4: Passive group membership	Model 5: Active group membership	<i>N</i>
Default model (Table 3)	0.011 (0.04)	−0.007 (0.09)	0.12 (0.07)	0.11 (0.05)**	0.18 (0.05)**	54
(1a). Inclusion of country dummies	0.046 (0.08)	0.006 (0.07)	0.07 (0.08)	0.08 (0.047)*	0.14 (0.08)*	54
(1b). Quasi-fixed effects	0.035 (0.11)	0.03 (0.08)	0.08 (0.09)	0.13 (0.05)*	0.16 (0.07)*	54
(2). Change growth period:						
1984–1998	−0.02 (0.13)	0.16 (0.20)	0.20 (0.19)	0.30 (0.16)	0.47 (0.12)**	54
1990–1998	0.43 (0.43)	−0.12 (0.28)	0.74 (0.34)*	0.54 (0.29)	0.65 (0.21)**	54
(3) Broader definition of Putnam groups	–	0.20 (0.13)	–	–	–	54
(4) Recursive method:						
excl. 4 fastest growing regions	0.02 (0.038)	0.003 (0.08)	0.10 (0.07)	0.10 (0.04)*	0.16 (0.04)**	50
excl. 4 slowest growing regions	−0.01 (0.05)	0.003 (0.09)	0.11 (0.07)	0.11 (0.05)*	0.19 (0.06)**	50
exclude 4 regions with highest score on social capital	0.008 (0.04)	0.03 (0.09)	0.10 (0.07)	0.14 (0.04)**	0.23 (0.05)**	50
exclude 4 regions with lowest score on social capital	0.11 (0.18)	0.011 (0.13)	0.13 (0.08)	0.10 (0.08)	0.18 (0.08)*	50
(5) No log specifications	0.14 (0.28)	−0.20 (0.36)	0.74 (0.50)	0.14 (0.15)	0.42 (0.20)*	54

Country-based cluster adjusted standard errors between parentheses except in specifications 1a and 1b.

\*  $p < 0.1$ .

\*\*  $p < 0.05$ .

dummies, the country of reference is the Netherlands, which has the highest country score on all social capital variables. In all models, the country dummies are not significant, except for Germany, which has a positive and significant coefficient. In case of the quasi-fixed effect model, we estimated the regional social capital effect when controlling for the national average of the same social capital variable. Regarding the hypothesized effects of social capital on growth, the estimated social capital coefficients are similar to those of the default model. Growth is positively and significantly related to both passive and active group membership. Hence, independent of the method used to control for country-specific effects, regional economic growth is significantly related to associational activity.

Our second robustness test consists of changing the growth period, i.e., our dependent variable (and the period-related independents like initial level of GRP). Given that our social capital data are measured in 1990, we consider two growth periods; 1984–1998 and 1990–1998. We not only find a (incidentally) significantly positive effect of the Olson groups, but more importantly, the social capital variable remaining significant is active membership. Passive membership is not significant in this specification of the dependent variable.

Thirdly, we test the reliability of our Putnam group variable. As Uslaner (1997) has shown, countries may differ in terms of relevant proxies for social capital. This may

hold especially for group membership as some have questioned the adequacy of certain groups in a European setting compared to the U.S. setting against which Putnam's ideas were developed (Stolle, 2002).<sup>12</sup> In addition to the groups mentioned earlier, we have added membership of sports and recreation clubs and women's groups to our measure of Putnam groups. Of all possibilities, we have chosen to add these as they also proxy associational activity that is *not* focused on rent-seeking activities that can be expected from groups, such as political parties and professional associations (cf. Olson groups). It turns out that economic growth is not significantly related to the extended Putnam group definition.

Fourthly, we have applied the recursive method to test if the composition of the sample influences our results. The recursive method implies that based on the order in which the observations are represented, observations are deleted and the estimated coefficients are based on this smaller sample. We have chosen to order the 54 regions according to regional economic growth and the social capital variables. When applying the recursive method with respect to growth, we estimate the effect of the social capital variables when the four slowest and four fastest growing regions are excluded. In a similar way, we perform our regression analysis and exclude the four regions with the highest, respectively, lowest scores on the social capital variables.<sup>13</sup> Results regarding our social capital variables are in line with earlier tests of the default model; growth is positively and significantly related to active membership, and passive group membership is only weakly robust.

Finally, we test if the log specification of the social capital variables drives our results. Therefore, we have estimated our model with 'raw' data. The results in Table 4 show that our initial positive and significant effect of active group membership is not influenced, but that passive group membership becomes insignificant.

In sum, our robustness analysis shows that regional economic growth is positively and significantly related to active group membership in all our tests. The significant result with respect to passive group membership in the default model is not robust. Trust is never significant and the distinction between Putnam and Olson groups does not yield robust results.

## 5. Conclusions and discussion

In this paper, we have built on regional growth empirics as developed by Barro and Sala-I-Martin (1995) and the social capital debate to which Putnam (1993, 2000) and Knack and Keefer (1997) made important contributions. We studied 54 regions in Europe and applied a standard empirical growth model to test if the Putnam hypothesis can be generalized, i.e., is regional economic growth related to social capital? Social capital is operationalized in terms of generalized trust and associational activity, split up in several

<sup>12</sup> We thank one of the referees for pointing this out.

<sup>13</sup> In principle, the recursive method allows a graphical representation of the estimated coefficients when all 54 observations are subsequently deleted. For reasons of clarity and comprehensiveness, we have chosen to show only the results when the four highest/lowest observations are deleted. These reflect the general conclusion, however.

elements. Similar to [Knack and Keefer \(1997\)](#), we made a distinction between Putnam groups and Olson groups, and in addition we distinguished active and passive membership.

We have reached several conclusions. Our main result is the robust positive and significant relationship between regional economic growth and active membership. We have shown that variation in economic growth at the regional level in Europe is not directly associated with social capital in terms of trust and passive group membership. In addition, in line with [Knack and Keefer \(1997\)](#), the distinction between Putnam and Olson groups does not yield additional insights. In other words, we have shown the hypothesis put forward by [Putnam et al. \(1993\)](#) that social capital matters for regional economic success in Italy can be generalized to the extent that it is not so much the existence of social networks that contribute to regional economic growth but the active involvement in it.

Our regional analysis does not support the hypothesis that economic growth is positively associated with trust. There may be several reasons for this. First, [Glaeser et al. \(2000\)](#) have shown that the trust question used in this type of research actually measures trustworthiness and not trust (see also [Bellemare and Kroger, 2003](#)). They suggest developing alternative instruments to measure trust. Our research supports their conclusion in the sense that in contrast with theoretical predictions, we do not find a significant effect of trust. This may not be due to falsified theory, but may in fact be the result of an imperfect proxy for trust. This argument may also hold for the fact that the supposed effects of the Putnam and Olson effects are not corroborated by the empirics. Finding associations that proxy the supposed theoretical links may differ between countries and regions. For example, from a practical point of view, it may make no sense to look at membership of unions in Nigeria, given that they may be forbidden, as well in Denmark, where membership is obliged in some professions. The role of hunting associations may be relevant in Finland, but not in central Amsterdam. The fact that we find weak nonrobust effects of passive membership and robust findings on active membership may be partly caused by the fact that the latter is a more complete proxy that covers the location-specific effects much better. Second, and closely related to the first argument, [Danielson and Holm \(2003\)](#) have shown using trust experiments in Tanzania and Sweden that the predictive power of survey trust differed considerably between these countries. Their experiments suggest that survey trust is significantly related to individual behavioral trust and trustworthiness in some populations, but not in others. This may also help understand why [Beugelsdijk et al. \(2004\)](#) found that trust was not robust in [Knack and Keefer's \(1997\)](#) sample of 29 OECD countries, but robust in [Zak and Knack's \(2001\)](#) follow-up analysis in which 12 mostly less developed countries were added.

Future research should focus on the mechanisms through which social capital in terms of associational activity influences economic growth in the European regions. As we described in the section on group membership, theory argues that associational activity may limit the extent of free riding through feelings of collectivity. However, there is no clear understanding how these mechanisms exactly work. More insight in these mechanisms is especially important for policymakers at the regional and multinational level. As long as we do not exactly know the mechanism between regional economic

growth and active membership as a proxy for social capital, it is too early to formulate clear policy implications.

Related to this is the potentially important distinction between different types of social capital. In recent work, Putnam (2000) distinguishes what he calls ‘bridging social capital’ in which bonds of connectedness are formed across diverse social groups, and ‘bonding social capital’ that cements only homogenous groups. Putnam clearly prefers the bridging type of social capital. Conceptually, the idea of bridging ties has some echoes of Granovetter’s earlier work on strong and weak ties (Granovetter, 1973). Future research could follow Putnam’s line of thinking and try to find empirical evidence for the assumed positive effects of bridging social capital and the potentially negative effects of the bonding type of social capital.

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