

# INDIVIDUAL TRUST AND QUALITY OF REGIONAL GOVERNMENT

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## Abstract

The impact trust has on economic performance has been widely explored. However, relatively little attention has been paid to the conditions under which individual trust can develop. The aim of this paper is to analyse the effect on generalized trust of the quality of government at the regional level in a multi-country context across regions in Europe. To this end, as a proxy of the quality of institutions, we use the European Quality of Government Index, calculated at regional level over 27 EU countries. The analysis is conducted on data extracted from the European Social Survey 2012 and refers to 142 regions of 15 EU members. Considering the clustered nature of data, the multilevel approach is used. Our estimates evidence, as expected, the importance of individual factors such as life satisfaction, health, religiosity, gender, age, education, income, companionship, crime victimization. The country in which one resides has a non-negligible effect on individual trust. As far as the scope of this paper is concerned, results show that to live in a region with high quality of the local government influences positively the individual trust. This positive association survives the inclusions of several contextual variables at the regional level.

**Keywords:** trust, institutions, quality of regional government, multilevel analysis

## 1. Introduction

Generalized trust in other people concerns people beliefs about the ‘generalized others’ when no specific information exists (Yamagishi, 2001). Not being based on personal knowledge of the trusted, generalized trust differs from more solid forms of trust in people about whom individuals have prior knowledge such as family, friends and colleagues (Dinesen, 2013).

The impact trust has on economic performance has been widely explored. A number of studies conclude that trust is essential for cooperation in economic, social and political relationships both at aggregate and individual level. At the aggregate level, it improves a country’s economic performance thanks to its capacity to reduce transaction costs. Generalized trust is also related to economic equality (Rothstein and Uslaner, 2005). When the level of generalized trust is high, economic prosperity goes together with democracy and with an equitable distribution of resources (Rothstein and Eek, 2009;

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Delhey and Newton, 2003). At the individual level, it is related to personal economic success. However, people in some regions are able to trust each other while others are not and the level of generalized trust varies significantly across countries. For example, in countries such as Denmark, Norway, and the Netherlands, around 65 percent of people declare that they believe that ‘most other people can be trusted,’ while in countries such as Brazil, the Philippines, and Turkey, only around 10 percent agreed with the statement. For countries like Great Britain, Germany, Italy, Spain and the United States approximately 35 percent agreed with the statement (Rothstein and Eek, 2009).

According to a strand of the literature, the level of trust is, in part, determined by education (Knack and Keefer 1997; Rothstein and Stolle 2002), religion (Guiso et al., 2003; Berggren and Bjornskov, 2011; Traunmüller, 2011 among others), age (Rothstein and Stolle, 2002 and 2003). According to another strand, it is also determined by contextual factors such as the institutional quality (Binder and Francois, 2011; Zak and Knack, 2001) or a wider group of economic institutions and policies that are connected to each other: size of government, legal structure and security of property rights, regulation of credit, labor, and business (Berggren and Jordhal, 2006), and the ethnic homogeneity (Paxton, 2007). The reasons for variation in trust across countries are, however, not well understood and relatively little attention has been paid to the conditions under which generalized trust can be enhanced. Given the recognized importance of generalized trust and the variability of trust across countries, to analyse its determinants, that is, to try to establish which individual and contextual characteristics promote it is noteworthy.

There is a rising consensus that levels of trust are shaped by individual-specific attributes, as well as aggregate factors such as local institutions and community characteristics. A number of scholars, however, albeit admit that micro-level trust relations are affected by macro-level or micro-level processes, rarely put these two levels in the same framework to analyse them. They either exclusively use individual-level data such as social and demographic characteristics (e.g., gender, age, family background, education, etc); or entirely base their analyses upon aggregated national-level data to estimate the influence of macro-level institutions on trust (Wang and Gordon, 2011).

Individual-level studies find that trust is much higher among richer, well-educated individuals and married persons and that men are slightly more trusting (Glaeser et al., 2000; Guiso et al., 2003 among others). These studies, usually, consider individuals’ socioeconomic characteristics and ignore the contextual effects of the various countries.

To take national characteristics into consideration, previous empirical studies usually aggregate individual-level data to the national level. For example, Knack and Keefer (1997) aggregate the World Value Survey data to 29 market economies and find that *“trust and civic norms are stronger in nations with higher and more equal incomes, with institutions that restrain predatory actions of chief executives, and with better educated and ethnically homogeneous populations”* (p. 1251).

Some scholars have demonstrated that “*institutions affect growth via their impact on trust*” at the country (Zak and Knack, 2001, p.279) as well as the regional level (Tabellini, 2010).

The association between incorruptibility of institutions and trust, for example, is well documented from an empirical point of view (Delhey and Newton, 2005; Dinesen, 2013; Rothstein and Uslaner, 2005). Other features of institutions which have been found to be positively associated with generalized trust are procedural fairness and impartiality (Delhey and Newton, 2005; Rothstein and Uslaner, 2005; Rothstein and Stolle, 2008 among others). Corrupt institutions are less credible than fair and impartial institutions in enforcing law and order and hence provide weaker incentives for trustworthy behaviour. They are also expected, more than others, to give place to practises of discrimination that are likely to increase suspicion about the motives of other people. According to Rothstein and Stolle (2008) unfair and biased practices in the administrative apparatus of the state influence people's propensity to trust others in their society. Corrupt institutions manifest themselves in the behaviour of bureaucrats. As representatives of institutions, these officials show behavioural norms that citizens use as a yardstick for the moral stock of the general population. If officials do not themselves follow the rules that they administer, this implies that other people in general are not to be trusted (Rothstein and Eek, 2009).

The quality of institutions, almost certainly, affects generalized trust. Albeit generalized trust is one of the most discussed topics in social sciences, and the quality of institutions occupies a not negligible space in the economic debate, how the first is affected by the second is a question not adequately explored. The quantitative field has, in fact, focused widely at the national level of analysis, generally ignoring sub-national variation in trust (Binder and Francois, 2011; Delhey and Newton, 2004 among others) or concentrating on a single country (Rothstein and Stolle, 2003; Camussi and Mancini, 2016).

A need emerges for a multilevel framework in studies of trust (Beugelsdijk, 2009). Individual trust is, in fact, a phenomenon probably shaped by multilevel mechanisms since it might be affected not only by individual characteristics or experiences, but also by the institutional and social environment in which the respondent lives. To analyze only aggregated or only disaggregated data, therefore, might lead to misleading conclusions (Snijders and Bosker, 2012). Multilevel approach allows overcoming the problem of ‘the wrong level’ since it consents to estimate simultaneously and in a way statistically accurate both the influence of contextual- and individual-level factors.

A very few scholars have studied generalized trust in a multi-country context by adopting a multilevel approach (Freitag and Bühlmann, 2009; Wang and Gordon, 2011 among others), but there is still a lack of studies that test the determinants of generalized trust using a wide sample of countries and concentrating on the simultaneous estimation of individual and societal conditions in order to

demonstrate how environment within a country influences the impact of individual characteristics on trust.

As far as the specific scope of this paper, the idea is that within the same country people can have different access to collective provisions such as education, health care and law enforcement depending on the region where they live. Therefore, the generalized trust of individuals living the same country may differ by regions depending also on the quality of public administration at a regional level<sup>1</sup>. To the best of our knowledge, previous studies that try to answer to a similar question consider or just one country (Camussi and Mancini, 2016) or use regional data for both institutional quality indicator and trust (Charron and Rothenstein, 2014).<sup>2</sup>

To analyse the effect on individual trust of the quality of institutions at the regional level in a multi-country context we consider some European Union countries. As a proxy of the quality of institutions, we use the European Quality of Government Index (EQI), calculated at regional level over twenty-seven EU countries. This index is based on the residents' perceptions of three pillars of the regional quality of government: corruption, impartiality and quality of public services.

The analysis is conducted on data extracted from the European Social Survey 2012 and refers to 142 regions of 15 EU members. The selection of 15 EU countries is based on the availability of information in both data sets. The majority of individual and contextual variables that previous studies in the literature have found to significantly affect generalized trust are explored.

The paper is structured as follows. Section 2 discusses the related literature. Data are presented in section 3 and the econometric strategy in section 4. In section 5 results are presented and some concluding remarks are proposed in section 6.

## 2. Related Literature

Despite the widespread agreement that generalized trust facilitates long-term growth and subjective well-being, there is less agreement on its determinants. This issue has recently received renewed attention. A dominant debate in the literature on the determinants of generalized trust has been the question of whether trust is mostly a cultural trait transmitted from one generation to the next or rather the result of living in a context of impartial institutions. However, distinguishing between the two explanations is problematical from an empirical point of view; a culture of trust, according to Dinesen (2013) corresponds, in fact, with uncorrupted institutions. A number of scholars have started to look

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<sup>1</sup> Tabellini (2010), albeit exploits variation among the European regions within rather than across countries, explores the link between historical institutions, culture and economic development and does not recur to a multilevel strategy. His findings point to the importance of understanding the diffusion of specific cultural traits, rather than the consolidation of formal institutions.

<sup>2</sup> Charron and Rothenstein (2014) conduct an analysis to test the relation between the quality of government (QoG) of 206 regions in 24 European countries and social trust obtained by aggregating individual trust at regional level.

at political institutions and the overall character of the state as a possible explanation for the variation in generalized trust (Rothstein and Eek, 2009). A number of macro-level studies discard the within-country information, ignoring micro-level mechanism that might contribute to producing trust and explaining its variation (Wang and Gordon, 2011).

Among the studies that refer to one country, Rothstein and Stolle (2003) subjected the pooled Society-Opinion-Media (SOM) surveys<sup>3</sup> data from 1996 to 2000 to a factor analysis. According their findings, generalized trust in Sweden might be explained by trust in order institutions (the police and the courts) as well as by the perceived impartiality of welfare-state institutions.

Kumlin and Rothstein (2005), by using data from SOM survey conducted in Sweden in 1999, found that citizens who have contacts with selective welfare institutions (which might give rise to suspicion of operating in less impartial ways due to the problem of assessing individual needs) trust less than citizens who only have contacts with universal (i.e. non needs-assessing) welfare institutions. They also showed that the negative impact from ‘untrustworthy’ government institutions on generalized trust is statistically significant even after controlling for a number of other variables, such as education, social class, employment status, income, satisfaction with life, activity in voluntary associations, etc.

Among the studies limited at a country coverage but at a regional level, Camussi and Mancini (2016) contribute to the literature on the link between public institutions and social capital by analysing how the quality of local public services influences individual trust in Italy. Using data from the Istat survey “*Aspetti della vita quotidiana*”, they build a quality of local services indicator at the local labour market area level. Then the authors estimate the effect of their quality measure on generalized trust and trust in local government, controlling for relevant individual characteristics, local labour market area characteristics and provincial fixed effects. As a second step, to deal with the potential endogeneity of the measure of the quality of institutions, the two authors rely on an instrumental variable approach using a two-step GMM estimator. Their findings suggest that there is a positive relation between local services’ quality and both generalized trust and trust in local administrations.

Among the authors that have tried to establish how generalized trust in different countries might be explained, Rothstein and Eek (2009) have conducted two parallel experiments in two countries where the levels of corruption and social trust are very different. One group of 64 Swedish and one group of 82 Romanian undergraduate students responded to a number of settings that describe situations in a foreign country that is unknown to them and experience problems in which they need immediate assistance from a local authority (the police station or a doctor’s surgery). The student

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<sup>3</sup> Conducted by The SOM institute at Göteborg University, Sweden.

tries to receive prompt assistance at the same time as another person who lives in the unspecified foreign country. The results supported the hypothesis that trust in authorities affects the perceptions of the trustworthiness of others in general. Although some of the effects were stronger for one sample than for the other, the influence of vertical trust on social trust was true for both the high-trusting (Swedish) and the low-trusting (Romanian) sample.

Bjørnskov (2004), by using survey data from 29 European countries, showed that a high level of generalized trust is strongly correlated with a low level of corruption.

Bidner and Francois (2011), in an article focused on those institutions that are most important in facilitating trade, try to establish why people are more trustworthy in some places than others. The two authors use the International Property Rights Index that has three sub-components and aims to capture what they mean by the term institutions in their article. They use the World Values Survey data for 72 countries and find that trust may be the result of well-functioning institutions of law enforcement and punishment. Bidner and Francois (2011) have also experimented with other of the commonly used measures that could be thought of as proxies for institutions variables (government effectiveness for political components, rule of law for legal ones, the International Country Risk Guides corruption measure as a measure of bureaucratic probity etc). Replacing the comprehensive institution measures with any of these does not change their basic findings.

Delhey and Newton (2004) present an empirical analysis based upon data for sixty countries collected from a variety of sources. Their dependent variable, trust, comes from the World Values Surveys (WVS hereafter), which ask the standard question about generalized trust. WVS also sample populations in subnational regions, but only nation-states are examined, because – according the two authors - it is problematic to get other types of information (for example, GNP, income inequality and homicides) for sub-national populations. The measure for corruption is the 1996 Corruption Perceptions Index from Transparency International ([www.transparency.org](http://www.transparency.org)). They conclude that uncorrupted government seems to set a structure in which citizens can act in a trustworthy manner and realistically expect that most others will do the same.

Among studies that adopt a multilevel strategy of analysis, Paxton (2007) presents a test of generalized trust across 31 countries and 35,144 individuals. Data come from the WVS. A multi-level, cross-national model, including both individual level and country-level variables was estimated to predict the determinants of trust. The paper confirms the finding of previous research on trust (Delhey and Newton 2003; Brehm and Rahn 1997) that individual-level factors matter for the creation of generalized trust. For example, education, age and employment increase generalized trust, divorce decreases trust, and gender is unrelated to trust. Apart from the individual-level effects, the country-level results suggest that governmental institutions are relevant for individual trust. National level economic development and ethnic homogeneity are also found to be important to the creation of trust.

Wang and Gordon (2011) study how and to what degree institutions affect trust – after controlling the relevant socioeconomic factors in 35 countries. Their study use a multilevel model where the group is represented by country; it is, in fact, prompted by the idea that the dependent variable, trust, has an micro-level as well as macro-level or context aspect, so that one can attempt to bridge the relationships between the multilevel mechanisms which shape individual trust. The analysis is focused on the determinants (or macro-level institutions) of the general trust. The two authors introduce GDP per capita into the models in order to generate higher quality of estimates for macro-level institutions. A random slope model and four random intercept models are estimated. The findings show that the context matters and institutions matter.

Freitag and Bühlmann (2009) use the World Values Surveys (1995-1997 and 1999-2001) to simultaneously test for differences among respondents in 58 countries and for variations in levels of trust between countries with different institutional configurations. The authors do not assume that basic trust and the influence of the independent variables are the same in all countries but rather that they are dealing with variables that can vary according to context. Hierarchical models also allow for the modelling of specific macro features (e.g., particular political institutions) that explain variation on the macro level (e.g., from country to country). Furthermore, cross-level interactions - the influence of societal structures on the ways in which individual-level factors matter - can be controlled for. With regard to the contextual factors, Freitag and Bühlmann (2009) find that countries whose authorities are perceived as incorruptible, whose institutions of the welfare state reduce income disparities, and whose political interests are represented in a manner proportional to their weight, have citizens who are more likely to trust each other.

Our study differs from the previous ones because it aims to examine how the quality of local institutions influences individual generalized trust across regions in Europe by using a multilevel approach.

### 3. Data

The data utilized in the paper come from the European Social Survey (ESS). The ESS is a biennial cross-sectional survey that provides a representative sample of individuals for a large number of European nations. The questionnaire aims to monitor values, attitudes, behaviour patterns and opinions on a wide range of social items. It also includes demographics and socio-economic characteristics of the respondents.

The dependent variable *Trust* is taken from responses to the question “*Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with*

people?”. Answers are recorded on an 11-point scale from “not at all” (coded as 0) to “complete trust” (coded as 10).

In this paper the ESS Multilevel Data version has been used. This version contains data about individuals (the ESS respondents), regions (mainly data collected from EUROSTAT) and countries (data collected from different sources). As it is declared on the ESS website (<http://www.europeansocialsurvey.org/data/multilevel/>), the purpose of the ESS Multilevel Data is “to make it easier for the research community to analyse the ESS-respondents with reference to the context they live in”. The reference year is 2012.

Since the aim of the paper is to examine how the quality of institutions influences the individual trust across regions in Europe, as a proxy of the quality of institutions, we use the European Quality of Government Index (EQI), calculated at regional level over twenty-seven EU countries. The EQI at regional level derives from a dataset developed by Charron, Lapuente and Rothstein (2010). The dataset contains information that comes from a survey carried out in 172 sub-national EU regions aimed at capturing average citizens’ perceptions and experiences of corruption, and the extent to which they rate their public services as impartial and of good quality. The focus is on education, health care and law enforcement. Respondents are asked to assess these public services with regard to the three fundamental concepts of quality administration: quality, impartiality and corruption. The answers led to the construction, based on factor analysis, of three indices reflecting the residents’ perception of the quality, the impartiality and the level of corruption of said services. These three pillars averaged together form the final figure for each region.<sup>4</sup>

In order to assess the objective of the paper, the ESS database has been merged with the EQI database using the territorial identification for the respondent in ESS. Table 1 reports the countries for which the merging has been possible and the distribution of individuals by country of the ESS dataset and of the sample used in this paper.

#### 4. Econometric strategy

The objective of the paper is to analyse in a multi-country context, the effect on trust of the quality of government at the regional level. To achieve this objective microdata are used and the individual represents the unit of analysis. However, since each individual lives in a region and each region is

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<sup>4</sup> In particular, after each stage of aggregation, each indicator is standardized to provide a regional distance to the national score, expressed in standard deviations. The World Bank Governance Indicator (WGI) (Kaufmann, Kraay and Mastruzzi, 2009) has been selected as the most suitable source to compare and assess QoG for EU countries. The country-level WGI and the regional-level data are used to explain the within-country variance. In particular, the regional QoG score for each country is aggregated by weighting each region’s score by their share of the national population. This mean score is subtracted from each region’s individual QoG score and the obtained value shows if the region is above or below the national average and to what extent. This figure is then added to the national level of WGI, so each region has an adjusted score, centered on the WGI. The QoG is standardized for the EU-27 sample so that the mean is zero with a standard deviation of one, obtaining the EQI (for more information, see Charron, Dijkstra and Lapuente, 2014).



located in a country, the data have a clustered structure. The individuals which live within a region are probably more similar to each other than a randomly selected group of individuals would be, since they share the same external environment. Thus error terms among the individuals within a region can be correlated and the assumption of independence of Ordinary Least Squares (OLS) estimation may be violated resulting in downwardly biased standard error estimates and large test statistics. Multilevel modeling relaxes this assumption and, consequently, provides more statistically reliable estimates than those ignoring the hierarchical nature of the data.<sup>5</sup> This technique explicitly models the within-group homogeneity of errors by allowing the estimation of error terms for both the individual and the group. Moreover, multilevel models have the ability to simultaneously examine the effects of variables at both individual and group levels, as well as possible cross-level interaction effects. Indeed, in the multilevel analysis, variables at different levels are not simply add-ons to the same single-level equation, but are linked together in ways that make the simultaneous existence of distinct level-one and level-two equations explicit. In such a way, level-two factors are used not just as independent variables to explain variability in a level-one dependent variable, but also to explain variability in random intercept and random slopes (Bickel, 2007).<sup>6</sup>

In detail, considering as group the region in which the individual lives an econometric specification of a multilevel model may be expressed as follows:

$$t_{ij} = \beta_{0j} + \beta_{1j}X_{ij} + e_{ij} \quad [1]$$

where the  $t_{ij}$  is the level of trust of individual  $i$  ( $i=1 \dots N_j$ ) living in region  $j$  ( $j=1 \dots r$ ),  $X$  represents a variable measured at individual level,  $\beta_{0j}$  is the intercept,  $\beta_{1j}$  is the slope coefficient and  $e_{ij}$  is the random error term with zero mean and variance  $\sigma_e^2$ . In eq. [1], the regression parameter  $\beta_{0j}$  varies across level-2 units. The specification used here is a random intercept model, that is :

$$\beta_{0j} = \gamma_{00} + \gamma_{01}R_j + u_{0j} \quad [2]$$

$$\beta_{1j} = \gamma_{10} \quad [3]$$

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<sup>5</sup> One possibility to relax the assumption of independence is to use OLS with the cluster option. Compared with the OLS without clustering, this option increases the error term to accommodate the lack of independence of individual within regions. However, it leaves both the noise associated with differences between individuals and noise associated with differences between regions in the error term while the multilevel model allows the researcher to separate these two errors (see eq. 4)

<sup>6</sup> The possibility to employ contextual factors to explain variability in random components is the main difference between the multilevel model and random coefficient regression.

In so doing,  $\beta_{0j}$  differs across regions and depends on  $R_j$ , a variable defined at regional level, while  $u_{0j}$  is the random error term defined at the group level with zero mean and assumed to be independent of  $e_{ij}$ . Moreover,  $X_{ij}$  and  $R_j$  are assumed not to be correlated with the error terms,  $e_{ij}$  and  $u_{0j}$ . The random component  $u_{0j}$  captures variability in the intercept across clusters, while the fixed component  $\gamma_{00}$  is a weighted average of the intercept across all clusters.  $\gamma$  denotes the fixed level-two parameters.

The combining of micro (eq. 1) and macro models (eq. 2 and 3) produces a two-level mixed equation:

$$t_{ij} = \gamma_{00} + \gamma_{10}X_{ij} + \gamma_{01}R_j + (u_{0j} + e_{ij}) \quad [4]$$

The deterministic part of the model,  $\gamma_{00} + \gamma_{10}X_{ij} + \gamma_{01}R_j$  contains all the fixed coefficients, while the stochastic component is in brackets. The error term captures the residual variance, in the same way as OLS regression does, and the group-to-group variability of the random intercepts. It is clear that the error term displayed in eq. [4] is not independently distributed. Indeed, as data are nested at different levels of analysis, individuals belonging to the same group tend to have correlated residuals, so violating the assumption of independence<sup>7</sup>.

The specification adopted in this paper is a random intercept model (eq. [4]). In particular, the final model is:

$$t_{ij} = \beta_0 + \sum_{v=1}^k \beta_v X_{vij} + \psi QoG + \sum_{q=1}^n \omega_q R_{qi} + \sum_{c=1}^{14} \eta_c C_{ci} + u_{0j} + e_{ij} \quad [5]$$

where  $t_{ij}$  is the level of trust of the  $i$ -th individual living in region  $j$ ,  $X$  is a vector of individual-level variables,  $QoG$  is our variable of interest, the indicator of the quality of government or its components,  $R$  are a number of control variables at the regional level that, according to the theoretical and empirical literature, may affect individual level of trust.

Given the hierarchical structure of the data, a two-level mixed model with random intercepts at both region and country level could be used. However, in the sample used in this work the data of

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<sup>7</sup>A useful way to interpret the relative magnitude of the variance components is to compute the Variance Partition Coefficients (VPCs) which are the proportion of the variance that lies at each level of the model hierarchy. The VPC at regional level is calculated as the ratio of the regional variance to the total variance, that is:

$$VPC_{u0} = \frac{\sigma_{u0}^2}{\sigma_{u0}^2 + \sigma_e^2}$$

only fifteen countries are available. Since to measure accurately the between-group variance a ‘sufficient’ number of clusters are needed, at least 20 clusters (Heck and Thomas 2000; Rabe-Hasketh and Skondal 2008)<sup>8</sup>, countries (*C*) are treated as fixed effects.<sup>9</sup>

The empirical model expressed by eq. [5] relates individual level of trust to certain individual characteristics and regional variables. Trust outcome is treated as a continuous variable ranging from 0 to 10. The ordinal nature of the dependent variable could suggest to use an ordered logit or probit model. A multilevel cumulative logit model is therefore also implemented to verify the robustness of the results.

The choice of individual characteristics has been made in accordance with previous literature and the sign of the expected correlation are briefly outlined in Table 2 that synthesises the list of variables with their description and summary statistics.

As far as the specific scope of this paper, the idea is that within the same country people can have different access to collective provisions such as education, health care and law enforcement depending on the region where they live. Therefore, the individuals trust in the same country may differ by regions depending also on the quality of public administration at a regional level.

To measure the quality of public administration at a regional level, the European Quality of Government Index (EQI) and its sub-categories are used. Higher values of EQI and sub-indices (quality and impartiality) correspond to better institutions. On the contrary, the indicator of corruption is computed so that it takes on higher values for lower levels of corruption. In order to minimize the possibility of endogeneity, 2010 values of EQI and sub-indicators are used.

As control, some contextual variables such as per capita GDP and population size of the regions are considered. Indeed, previous works have shown that GDP per capita matters for trust at the country level (Knack and Keefer, 1997; Zak and Knack, 2001, and Delhey and Newton, 2005), motivating us to investigate this relationship across European regions. The main argument is that living in wealthier societies provides people with conditions favouring the acceptance of risk and, consequently, more willing to take a chance in trusting strangers (Delhey and Newton, 2005) .

The other variable considered is population size. A number of network analysis have shown that trust is more likely to evolve in small networks (e.g. Zelmer, 2003). All the data are available in the ESS Multilevel Data version. They are mainly collected from EUROSTAT and refer to 2010.

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<sup>8</sup>Other authors suggest even a bigger number of groups. For instance, Hox (2002) suggests 30 clusters and Mass and Hox (2004) 50.

<sup>9</sup>In a fixed-effects approach, the number of groups is not important, but the dimension becomes crucial as the estimated group-effect is unreliable for small-sized groups. On the contrary, in random-effects models the clusters must be sized with at least two observations.

## 5. Results

Table 3 reports the results.<sup>10</sup> Column 1 refers to the empty model, which is the model without covariates. The empty model is tested against the standard OLS regression by using the likelihood-ratio test which null hypothesis is  $\sigma_{u0}^2 = 0$ . If the null hypothesis is true, OLS can be used instead of a variance-components model. The test is highly significant and indicates that the intercept should be considered as a group-by-group variant coefficient. The evidence in favor of the multilevel approach holds for each model considered in table 3. Column 1 of table 3 shows that region-specific factors capture 13% of the total variance. However, when the dummies for countries are introduced (column 2) the variance explained by regional factors fall to 2%. The country-dummies are highly significant, except for Slovakia, which is similar to the controlling group (Portugal). A useful aspect of the multilevel approach is the possibility of using the variance at the different levels of analysis to calculate the reduction in the estimated residual variance due to the inserted variables. This is done by comparing the “empty model” with the extended specification of the model (Rabe-Hesketh and Skrondal, 2008). In the case of the contribution of country-effects in explaining regional variance this amounts to 85% and it is calculated by comparing the total variance (0.73) explained at regional level in the empty model (column 1 Table 3) and the variance (0.12) obtained when the country-dummies are considered (column 2 of Table 3).<sup>11</sup> Therefore, the country in which one resides has a non-negligible effect on individual trust. This result is consistent with Wang and Gordon (2011) that use a multilevel model where the group is represented by country. Indeed, they estimate how much of the variance of reported trust is due to individual-specificities and how much depends on the country of residence. They demonstrate that country-specific factors capture 42% of the total variance, indicating that country of residence does have a significant contextual influence on individual trust levels.

All individual characteristics considered are positively associated with individual trust, except subjective general health and being victim of crime (or having a member of the family been victim of crime) that show negative and significant coefficients.<sup>12</sup> However, it is worth noting that for health, since answers are graded 1 to 5 (1- very good, 5- very bad)<sup>13</sup>, the negative coefficient is meaning that bad health is associated with a lower predisposition to trust people. To be citizen of the country where the individual lives and to be unemployed do not seem to influence the individual trust. This finding

<sup>10</sup>The multilevel analysis is implemented with the ‘xtmixed’ routine of STATA. All models are estimated using restricted maximum likelihood (REML) over maximum likelihood (ML) since the latter is more sensitive to loss of degrees of freedom when dealing with a small number of groups (Bickel, 2007).

<sup>11</sup> The formula is:  $[(0.73-0.12)/0.73]$ .

<sup>12</sup> We have tested if age variable shows a U-shape relationship with self-reported trust. Coefficients are not significant and decided to model age as a linear effect.

<sup>13</sup>The question is: “How is your health in general? Would you say it is ... 1 Very good 2 Good 3 Fair 4 Bad 5 or, very bad?”

is consistent with Rothstein and Stolle (2003) that study the relationship between generalized trust and government institutions in Sweden.

Focusing on the variable of interest, the quality of public administration at regional level, the correlation with individual trust appears positive and significant: individuals that live in regions with a high quality of regional government show higher level of trust.<sup>14</sup> The result holds even if we control for the regional population size and GDP per capita. The positive association survives the inclusions of other contextual variables at the regional level.<sup>15</sup> As far as the regional variables reported in the table, the population size does not seem to affect the trust as in Delhey and Newton (2005) at the country level. On the contrary, the positive relation of GDP per capita with trust is confirmed at the regional level: the wealthier is the region, the higher the level of trust of its citizens.

It is worth noting that about 20% of the respondents refused to report their income. Because of this large number of missing data, in model 6 of table 3 the non-response rate of this variable in each region is included. The inclusion of this variable allows us to test if there is a systematic bias in the occurrence of non-response data (Aslam and Corrado, 2012). The coefficient of the fraction of missing values by region on household income is negative and significantly different from zero. However, the inclusion of this control does not change our results.

Another problem could be that the random effects can be correlated with level 1 covariates. In this case models may be affected by the so-called level two endogeneity. The correlation between the lower level predictor variables and higher-level error terms can be removed by including the group-level means of the lower level variables, a procedure known as the Mundlak (1978) correction. Mundlak correction is considered in column 7 of table 3 where the regional averages from individual variables have been calculated applying the ESS design weights (European Social Survey, 2014). Moreover, a test for level-two endogeneity can be carried out as a Wald test of the joint hypothesis that all coefficients for the cluster means are zero (Grilli & Rampichini, 2006). The Wald test is equal to 11.02 with  $df = 12$  so that the null hypothesis that the coefficients of the group means are all zero

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<sup>14</sup> In Table 3 ordinal variables such as Life satisfaction and Health are treated as continuous. However, model 5 has also been estimated considering these two variables as categorical. The coefficient of EQI appears always positive but significant at 10% instead than 5% (the results are available upon request).

<sup>15</sup> In literature another measure of contextual economic condition is unemployment rate while regional size is also proxied by population density. Instead of the two regional variables in model 5, these two variables have been considered, however, only population density appears to be correlated with the individual trust. We also control for whether or not a region is a capital region or an autonomous region (source: EQI database). The first, to account for differences deriving from living in a larger town compared to a small one (Camussi and Mancini, 2016). The second, to consider that some countries are federal or semi-federal (Charron and Rothstein, 2014). The coefficients of these dummies appear to be not significant. Finally, following Wang and Gordon (2011) we consider the percentage of population who belong to four specific religions: Catholic, Protestant, Orthodox and Muslim as a proxy of macro-level informal institutions. These shares are defined by computing regional averages from individual data using ESS design weights. However, the coefficients of these variables are not significant except for the Muslim group. In all specifications the results about the variable of interest, EQI, are confirmed (results are available upon request).

is accepted. Results are almost equivalent to model (5) and (6), the main difference is that the coefficient of GDP per capita is no longer significant.

Our findings are in line with previous research analysing how the institutional quality of a country influences individual trust (Delhey and Newton, 2005; Zack and Knack, 2001, Paxton, 2007, Freitag and Bühlmann, 2009) and confirm that the positive relation holds also for within-country quality of government (Camussi and Mancini, 2016; Charron and Rothstein, 2014).

Considering the components of EQI (table 4), the results show that the quality of services and corruption are positively correlated to individual trust, while the evidence is inconclusive for the impartiality index. Results show that to live in environments with a low level of corruption and a good quality of local services seems to be correlated with a higher propensity to trust other people.

Table 5 reports the estimates from a random-effects ordered logit model and shows that results are qualitatively the same as those discussed throughout the paper.<sup>16</sup>

The results considering corruption are consistent with Rothstein (2000), Delhey and Newton (2004), Bjørnskov (2004), and evidence that even low levels of corruption at the regional level are associated to high generalized trust. For the impartiality of local government responsible for the implementation of local services, the results are not in line with Rothstein and Stolle (2003).

We are aware that possible channels of reverse causality may exist where QoG is high for a higher presence of people that trust others in the region. Further work will be to use instrumental variables in order to assess the direction of causality.

## 6. Concluding remarks

The paper aims at examine the effect of quality of institutions on generalized trust. To achieve this objective it goes beyond existing studies on the topic in important aspects since it focus on the regional level in a multi-country context. Microdata are used and the individual represents the unit of analysis.

Individuals that live within a region are probably more similar to each other than a randomly selected group of individuals would be, since they share the same external environment; each region is located in a country, the data have therefore a clustered structure. Multilevel approach allows us overcoming the problem of ‘the wrong level’ since it consents to estimate simultaneously and in a way statistically accurate both the influence of contextual- and individual-level factors.

A first important result of the paper is that the country in which one resides has a non-negligible effect on individual trust. The estimates evidence, as expected, the importance of individual factors such as life satisfaction, health, religiosity, gender, age, education, income, companionship,

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<sup>16</sup> STATA “meologit” routine that fits mixed-effects logistic models for ordered responses has been used.

crime victimization. The results are in line with previous research analysing how the quality of institutions influences generalized trust and confirm that the positive relation holds also for within-country quality of government. This positive association survives the inclusions of several contextual variables at the regional level. Individuals are more trusting in presence of uncorrupted institutions and of good quality of services provided by local authorities. The results are not in line with the majority of previous studies on the argument for what in concerns the relationship between generalized trust and impartiality.

These findings give support to the hypothesis that regional government institutions are responsible for some variation in generalized trust within a society or across several societies.

Table 1 Distribution of individuals by country

Countries	ESS dataset 2012		Sample used	
	Number	%	Number	%
Belgium	1869	6%	1704	7%
Bulgary	2260	8%	1908	8%
Czech Republic	2009	7%	1332	6%
Denmark	1650	6%	2543	11%
Germany	2958	10%	1401	6%
France	1968	7%	1564	7%
Hungary	2014	7%	1779	8%
Italy	960	3%	1777	8%
Spain	1889	6%	1398	6%
Great Britain	2286	8%	566	2%
Netherland	1845	6%	1562	7%
Poland	1898	6%	1458	6%
Portugal	2151	7%	1001	4%
Sweden	1847	6%	1662	7%
Slovakia	1847	6%	1236	5%
Total	29451	100%	22891	100%



Table 2 Summary statistics of individual level variables and expected effect

	Description	Obs	Mean	SD	Min	Max	Expected effect
<i>Dependent variable</i>							
Trust	Most people can be trusted or you can't be too careful	22891	4.9	2.4	0.0	10.0	
<i>Independent variables</i>							
Life satisfaction	How satisfied with life as a whole	22891	6.8	2.4	0.0	10.0	positive
Social engagement	How often socially meet with	22891	0.6	0.5	0.0	1.0	positive
Health	Subjective general health	22891	2.3	0.9	1.0	5.0	positive
Actively religious people	How often do you attend religious services	22891	0.1	0.3	0.0	1	positive
Citizen of the country	Are you a citizen of - Dummy	22891	1.0	0.2	0.0	1.0	??
Victim of crime	Have you or a member of your household been a victim of the burglary or assault in the last five years- Dummy	22891	0.2	0.4	0.0	1.0	negative
Male	Dummy for gender	22891	0.5	0.5	0.0	1.0	positive
Age	Age of respondents	22891	50.1	17.9	15.0	103.0	positive
Education: tertiary	Dummy for tertiary education	22891	0.2	0.4	0.0	1.0	positive
Education: secondary	Dummy for secondary education	22891	0.5	0.5	0.0	1.0	positive
Unemployed	During last 7 days: unemployed actively looking for a job - Dummy	22891	0.1	0.2	0.0	1.0	negative
High household income	Dummy equal 1 if household's total net income is higher than the median of the actual distribution in the country of reference	22891	0.5	0.5	0	1.0	positive

Table 3 Individual Trust and the Quality of the Regional Government

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<b>Fixed effects</b>							
<b>Level 1: Individuals</b>							
Life satisfaction				0.169*** (23.62)	0.169*** (23.58)	0.169*** (23.58)	0.169*** (23.58)
Frequent social engagement				0.164*** (5.42)	0.164*** (5.43)	0.164*** (5.44)	0.164*** (5.42)
Health				-0.188*** (-10.52)	-0.187*** (-10.48)	-0.187*** (-10.48)	-0.186*** (-10.42)
Actively religious people				0.0807* (1.81)	0.0810* (1.82)	0.0805* (1.81)	0.0837* (1.87)
Citizen of the country				-0.105 (-1.24)	-0.0995 (-1.17)	-0.0994 (-1.17)	-0.0858 (-1.00)
Victim of crime				-0.186*** (-4.94)	-0.189*** (-5.00)	-0.189*** (-5.02)	-0.189*** (-5.00)
Gender: male				0.0834*** (2.95)	0.0842*** (2.98)	0.0847*** (3.00)	0.084*** (2.96)
Age				0.0045*** (5.09)	0.0046*** (5.09)	0.0046*** (5.09)	0.0046*** (5.16)
Education: tertiary				0.807*** (18.43)	0.803*** (18.34)	0.803*** (18.34)	0.804*** (18.33)
Education: secondary				0.298*** (8.39)	0.297*** (8.37)	0.297*** (8.37)	0.296*** (8.34)
Unemployed				-0.00321 (-0.05)	-0.00238 (-0.04)	-0.00325 (-0.05)	-0.00358 (-0.06)
High Household income				0.195*** (6.12)	0.191*** (5.99)	0.191*** (5.98)	0.190*** (5.95)
Constant	4.8*** (63.51)	3.5*** (19.34)	3.5*** (19.35)	2.7*** (13.20)	0.042 (0.04)	0.134 (0.12)	4.25* (1.89)
<b>Level 2: Regions</b>							
EQI			0.185* (1.77)	0.182* (1.91)	0.199** (2.09)	0.203** (2.16)	0.228** (2.26)
GDP - Euro per inhabitant 2010 (ln)					0.162* (1.74)	0.172* (1.86)	0.0894 (0.80)
Population size 2010 (ln)					0.0718 (1.32)	0.0857 (1.59)	0.0755 (1.28)
Share of missing values (income)						-0.749* (-1.75)	
Mundlak correction							YES

Table 3 Individual Trust and the Quality of the Regional Government

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<b>Country fixed effects</b>							
Belgium		1.493*** (5.36)	1.466*** (5.27)	0.825*** (3.27)	0.665** (2.56)	0.339 (1.07)	0.359 (1.01)
Bulgary		-0.193 (-0.82)	0.136 (0.45)	0.126 (0.46)	0.429 (1.41)	0.164 (0.49)	0.177 (0.37)
Czech Republic		0.843*** (3.70)	0.938*** (4.02)	0.474** (2.22)	0.540** (2.53)	0.376* (1.65)	0.114 (0.27)
Denmark		3.454*** (14.01)	3.182*** (10.97)	2.215*** (8.37)	2.096*** (7.58)	1.810*** (5.71)	1.968*** (4.51)
Germany		1.389*** (6.63)	1.216*** (5.27)	0.595*** (2.82)	0.435** (1.97)	0.125 (0.45)	0.257 (0.62)
France		0.902*** (4.38)	0.816*** (3.86)	0.431** (2.23)	0.321 (1.62)	-0.00981 (-0.04)	0.0786 (0.25)
Hungary		1.301*** (4.71)	1.420*** (5.01)	1.246*** (4.85)	1.311*** (5.01)	1.150*** (4.24)	1.000** (2.19)
Italy		1.471*** (6.56)	1.679*** (6.64)	1.256*** (5.43)	1.183*** (5.09)	1.042*** (4.32)	1.128*** (3.54)
Spain		1.584*** (7.42)	1.562*** (7.32)	1.158*** (5.96)	1.088*** (5.57)	0.816*** (3.32)	0.945*** (3.74)
Great Britain		1.898*** (8.83)	1.735*** (7.43)	1.136*** (5.33)	0.984*** (4.43)	0.732*** (2.81)	0.796*** (2.61)
Netherland		2.414*** (9.34)	2.181*** (7.53)	1.473*** (5.60)	1.273*** (4.65)	0.984*** (3.12)	1.205*** (3.50)
Poland		0.638*** (3.02)	0.813*** (3.49)	0.361* (1.70)	0.473** (2.15)	0.250 (1.00)	0.511 (1.28)
Sweden		2.539*** (9.21)	2.290*** (7.42)	1.495*** (5.34)	1.307*** (4.52)	0.971*** (2.83)	1.066** (2.57)
Slovakia		0.350 (1.35)	0.493* (1.82)	-0.0239 (-0.10)	0.0647 (0.26)	-0.0624 (-0.25)	-0.104 (-0.23)
<b>Random-Effects</b>							
<i>Variance</i>							
Regions	0.726	0.118	0.117	0.093	0.090	0.086	0.091
Individuals	4.804	4.807	4.807	4.451	4.451	4.452	4.451
Total	5.530	4.925	4.924	4.544	4.541	4.538	4.542
VPC	13%	2%	2%	2%	2%	2%	2%
LR test	3747.8	254.9	246.6	181.8	167.5	145.0	150.3
Number of groups	142	142	142	142	142	142	142
Observations	22891	22891	22891	22891	22891	22891	22891

In parentheses, t-values. Level of significance: \*\*\* 1%, \*\* 5% and \* 10%.

Table 4 Individual Trust and the Quality, Impartiality and Corruption Indicators

	(1)	(2)	(3)	(4)
<b>Fixed effects</b>				
<b>Level 1: Individuals</b>				
Life satisfacion		0.169*** (23.59)	0.169*** (23.57)	0.169*** (23.57)
Frequent social engagment		0.164*** (5.44)	0.164*** (5.43)	0.164*** (5.44)
Health		-0.187*** (-10.48)	-0.187*** (-10.47)	-0.187*** (-10.47)
Actively religious people		0.0804* (1.81)	0.0800* (1.80)	0.0806* (1.81)
Citizen of the country		-0.0962 (-1.13)	-0.0991 (-1.16)	-0.0978 (-1.15)
Victim of crime		-0.189*** (-5.03)	-0.189*** (-5.01)	-0.189*** (-5.02)
Gender: male		0.0847*** (3.00)	0.0846*** (2.99)	0.0846*** (2.99)
Age		0.00457*** (5.09)	0.00457*** (5.10)	0.00458*** (5.10)
Education: tertiary		0.804*** (18.35)	0.803*** (18.34)	0.803*** (18.33)
Education: secondary		0.297*** (8.38)	0.297*** (8.36)	0.297*** (8.38)
Unemployed		-0.00327 (-0.05)	-0.00327 (-0.05)	-0.00353 (-0.06)
High Household income		0.191*** (5.97)	0.191*** (5.99)	0.192*** (6.01)
Constant	4.795*** (63.51)	0.388 (0.35)	0.453 (0.41)	0.173 (0.15)
<b>Level 2: Regions</b>				
Corruption		0.235** (2.29)		
Quality			0.160** (2.08)	
Impartiality				0.0899 (0.99)
GDP - Euro per inhabitant 2010 (ln)		0.174* (1.88)	0.160* (1.72)	0.180* (1.92)
Population size 2010 (ln)		0.0763 (1.43)	0.0797 (1.49)	0.0808 (1.47)
Share of missing values (income)		-0.730* (-1.71)	-0.788* (-1.84)	-0.705 (-1.63)
Country fixed effects	NO	YES	YES	YES

Continued

Table 4 Individual Trust and the Quality, Impartiality and Corruption Indicators

	(1)	(2)	(3)	(4)
<b>Random-Effects</b>				
<i>Variance</i>				
Regions	0.726	0.085	0.086	0.089
Individuals	4.804	4.451	4.452	4.452
Total	5.530	4.536	4.538	4.541
VPC	13%	2%	2%	2%
LR test	3747.8	154.2	149.7	151.1
Number of groups	142	142	142	142
Observations	22891	22891	22891	22891

In parentheses, t-values. Level of significance: \*\*\* 1%, \*\* 5% and \* 10%.

Table 5 Random intercept ordered logit model

	(1)	(2)	(3)	(4)	(5)
<b>Level 1: Individuals</b>					
Life satisfaction		0.149*** (0.006)	0.149*** (0.006)	0.148*** (0.006)	0.148*** (0.006)
Frequent social engagement		0.141*** (0.025)	0.141*** (0.025)	0.141*** (0.025)	0.141*** (0.025)
Health		-0.167*** (0.015)	-0.167*** (0.015)	-0.166*** (0.015)	-0.166*** (0.015)
Actively religious people		0.069* (0.037)	0.069* (0.037)	0.068* (0.037)	0.068* (0.037)
Citizen of the country		-0.114 (0.072)	-0.111 (0.072)	-0.114 (0.072)	-0.112 (0.072)
Victim of crime		-0.151*** (0.031)	-0.151*** (0.031)	-0.151*** (0.031)	-0.151*** (0.031)
Gender: male		0.069*** (0.023)	0.069*** (0.023)	0.069*** (0.023)	0.069*** (0.023)
Age		0.005*** (0.001)	0.005*** (0.001)	0.005*** (0.001)	0.005*** (0.001)
Education: tertiary		0.721*** (0.037)	0.722*** (0.037)	0.722*** (0.037)	0.721*** (0.037)
Education: secondary		0.262*** (0.030)	0.263*** (0.030)	0.262*** (0.030)	0.263*** (0.030)
Unemployed		0.004 (0.050)	0.004 (0.050)	0.004 (0.050)	0.004 (0.050)
High Household income		0.150*** (0.026)	0.149*** (0.026)	0.150*** (0.026)	0.150*** (0.026)
Country fixed effects	NO	YES	YES	YES	YES
<b>Level 2: Regions</b>					
GDP - Euro per inhabitant 2010 (ln)		0.127* (0.073)	0.129* (0.073)	0.116 (0.073)	0.131* (0.073)
Population size 2010 (ln)		0.068* (0.041)	0.061 (0.040)	0.064 (0.040)	0.064 (0.042)
Share of missing values (income)		-0.667** (0.334)	-0.649* (0.334)	-0.706** (0.334)	-0.634* (0.338)
EQI		0.157** (0.071)			
Corruption			0.182** (0.078)		
Quality				0.129** (0.058)	
Impartiality					0.058 (0.067)
<b>Variance : regions</b>	0.496***	0.043***	0.043***	0.043***	0.045***
VPC	13.1%	1.3%	1.3%	1.3%	1.3%
Observations	22,891	22,891	22,891	22,891	22,891

Standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

## References

- Alesina, A. and La Ferrara, E.,(2002), Who trusts others? *Journal of Public Economics*, 85, 2, 207-34.
- Aslam, A. & Corrado, L. 2012. The geography of well-being, *Journal of Economic Geography*, 12, 627–649. doi:10.1093/jeg/lbr041.
- Berggren, N. and Bjørnskov C. (2011), Is the Importance of Religion in Daily Life Related to Social Trust? Cross-Country and Cross-State Comparisons, *Journal of Economic Behavior & Organization* 80: 459-480
- Berggren, N., and Jordahl, H. (2006), Free to trust: Economic freedom and social capital, *Kyklos*, 59(2), 141-169.
- Bickel R. (2007), *Multilevel Analysis for Applied Research, It's Just Regression!* The Guilford Press, New York.
- Brehm, J., & Rahn, W. (1997), Individual-level evidence for the causes and consequences of social capital, *American journal of political science*, 999-1023.
- Beugelsdijk, S. (2009), A multilevel approach to social capital, *International studies of management & organization*, 39(2), 65-89.
- Bidner, C. and Francois, P. (2011), Cultivating trust: Norms, institutions and the implications of scale, *The Economic Journal*, 121(555), 1097-1129.
- Bjørnskov, Christian (2004), *Social Capital, Political Competition, and Corruption*, Aarhus: Aarhus School of Business, Aarhus University.
- Bjørnskov, C. (2007), Determinants of generalized trust: A cross-country comparison, *Public choice*, 130(1), 1-21.
- Camussi S. and Mancini A. L., (2016), Individual trust: does quality of public services matters?, *Temidi Discussione (Working Papers) Banca d'Italia*, 1069.
- Charron, N., Lapuente V. and Rothstein B. (2010), Measuring the quality of government and subnational variation. Report for European Commission, Directorate-General for Regional Policy. [http://ec.europa.eu/regional\\_policy/information/studies/index\\_en.cfm#2](http://ec.europa.eu/regional_policy/information/studies/index_en.cfm#2)
- Charron N., Dijkstra L. and Lapuente, V., (2014), Regional Governance Matters: Quality of Government within European Union Member States. *Regional Studies* 48, 1, 68-90, DOI: 10.1080/00343404.2013.770141.
- Charron, N., and Rothstein, B. (2014), Social Trust, Quality of Government and Ethnic Diversity, *QoG Working Paper Series*, 2014(20), 20.
- Charron, N., & Rothstein, B. (2016), Does education lead to higher generalized trust? The importance of quality of government. *International Journal of Educational Development*, 50, 59-73.

- Delhey, Jan, and Kenneth Newton (2003), Who Trusts? The Origins of Social Trust in Seven Societies, *European Societies* 5 (2): 93–137.
- Delhey, Jan, and Kenneth Newton (2004), *Social Trust: Global Pattern or Nordic Exceptionalism*. Berlin: Wissenschaftszentrum Berlin für Sozialforschung.
- Delhey, J. and Newton, K. (2005), Predicting cross-national levels of social trust: global pattern or Nordic exceptionalism? *European Sociological Review*, 21, 311–327.
- Dinesen, P. T. (2013), Where you come from or where you live? Examining the cultural and institutional explanation of generalized trust using migration as a natural experiment, *European Sociological Review*, 29(1), 114-128.
- European Social Survey (2014). Weighting European Social Survey, 25th April. [https://www.europeansocialsurvey.org/docs/methodology/ESS\\_weighting\\_data\\_1.pdf](https://www.europeansocialsurvey.org/docs/methodology/ESS_weighting_data_1.pdf)
- Freitag, M. and Bühlmann, M. (2009), Crafting trust. The role of political institutions in comparative perspective, *Comparative Political Studies*, 42, 1537–1566
- Glaeser, E. L., Laibson, D. I., (2000), Scheinkman, J. A., and Soutter, C. L., Measuring trust, *Quarterly Journal of Economics*, 115, 3, 811-46.
- Grilli, L. and Rampichini, C. (2006). Model building issues in multilevel linear models with endogenous covariates, *Proceeding of IASC-Interface-IFCS workshop*, Villa Orlandi Island of Capri, Italy, 4–6 September.
- Guiso, L., Sapienza, P., Zingales, L., (2003), People’s opium? Religion and economic attitudes, *Journal of Monetary Economics* 50 (1), 225–282.
- Heck, R.H., and S.L. Thomas. 2000. *An introduction to multilevel modelling techniques*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Hox, J.J. 2002. *Multilevel analysis: techniques and applications*. Mahwah, NJ: Lawrence Erlbaum Associates. <http://dx.doi.org/10.1787/9789264230781-en>
- Hooghe, M., Reeskens, T., Stolle, D., and Trappers, A. (2009), Ethnic diversity and generalized trust in Europe: A cross-national multilevel study. *Comparative political studies*, 42(2), 198-223.
- Kaufmann, D., Kraay, A., & Mastruzzi, M. (2009), Governance matters VIII: aggregate and individual governance indicators, 1996-2008, Policy Research Working Paper 4978.
- Kumlin, S. and Rothstein, B. (2005), Making and Breaking Social Capital. The Impact of Welfare State Institutions, *Comparative Political Studies* 38 (4): 339–65.
- Mass, J.M, and J.J. Hox. 2004. Robustness issues in multilevel regression analysis. *Statistica Neerlandica* 58, 127-137. doi: 10.1046/j.0039-0402.2003.00252.x
- Mundlak, Y. (1978), On the pooling of time series and cross-sectional data, *Econometrica* 46:69-86.



- Paxton, P. (2007), Association memberships and generalized trust: A multilevel model across 31 countries, *Social Forces*, 86(1), 47-76.
- Rabe-Hesketh, S., and A. Skrondal. 2008. *Multilevel and Longitudinal Modeling Using Stata*. Stata Press, 2nd edition. College Station, TX: Stata Press.
- Raudenbush, S.W. and Bryk, A.S., (2002), Hierarchical Linear Models. Sage Publication, Thousand Oaks, California.
- Rothstein, B., and Stolle, D. Rothstein, B. (2002), How Political Institutions Create and Destroy Social Capital: An Institutional Theory of Generalized Trust, Paper presented at the 98<sup>th</sup> Meeting of the American Political Science Association in Boston, August 29-September 2.
- Rothstein, B., and Stolle, D. (2003), Social capital, impartiality and the welfare state: An institutional approach, in *Generating social capital* (pp. 191-209). Palgrave Macmillan US.
- Rothstein, B. and Stolle, D. (2008), The state and social capital. An institutional theory of generalized trust, *Comparative Politics*, 40, 441–460.
- Rothstein, B. and Uslander, E. (2005), All for all: equality, corruption and social trust, *World Politics*, 58, 41–72.
- Rothstein, B., and Eek, D. (2009), Political corruption and social trust: An experimental approach, *Rationality and Society*, 21(1), 81-112.
- Snijders, T.A.B. and Bosker, R.J., (2012), Multilevel Analysis: An Introduction to Basic and Advanced Multilevel Modeling. 2<sup>nd</sup> Edition, Sage Publications Inc., Thousand Oaks, California.
- Tabellini, G. (2010), Culture and institutions: economic development in the regions of Europe, *Journal of the European Economic Association*, 8(4), 677-716.
- World Values Study Group (1994), *World Values Survey, 1981-1984 and 1990-1993*, Ann Arbor, MI: ICPSR.
- Wang, L., and Gordon, P. (2011), Trust and institutions: A multilevel analysis. *The Journal of Socio-Economics*, 40(5), 583-593.
- Yamagishi, T. (2001), Trust as a form of social intelligence, in Cook, K. S. (Ed.), *Trust in Society*, New York: Russell Sage Foundation, pp. 121–147.
- Zak, P.J. and Knack, S. (2001), Trust and growth, *The Economic Journal*, 111 (April), 295–321.