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## Mapping Quality of Government in the European Union: A Study of National and Sub-National Variation

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**Abstract:**

This study maps-out the variation in quality of government ('QoG' - e.g. low levels or corruption, protection of the rule of law, government effectiveness and accountability) for the national and regional level in the 27 EU countries. We begin with a national level assessment of QoG in the EU, elucidating the three significantly different cluster groupings of states that emerge using existing data from the World Bank. We then present a novel sub-national-level data for 172 EU regions based on a survey of 34,000 residents across 18 countries, which constitutes the largest multi-country survey on QoG at the regional level to date. We combine the two measures to conduct a large multi-level assessment of QoG in Europe. The paper shows, first, that there are notable differences in the level of quality of government across EU regions; second, that those differences, despite being inherently difficult to capture, can be measured with sufficient accuracy and are resistant to the most stringent robustness checks available; third, that those differences in quality of government are highly correlated with the available indicators of differences in socio-economic development of EU regions.

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## **1. Introduction: Why study quality of government in Europe?**

During the latest two decades, numerous studies have indicated that “quality of government” is a major determinant of many variables associated with the well-being of individuals within a country. This literature emphasizes the importance of how a government delivers its policies, instead of what a government delivers – that is, the size or “quantity” of government. Quality of government scholars deal with the extent to which a government delivers its policies – irrespective of their nature and degree or provision – in an effective way and without corruption. Evidence of such attention can be found not only in the rise of academic publications with a focus on this topic along with the interest from international organizations (IO’s) such as the World Bank and the United Nations, which have increasingly underlined the value of good governance and sound institutions from a development perspective (Holmberg, Rothstein and Nasiritousi 2008).

This has in turn given rise to a recent surge in new data creation, quantifying aspects of quality of government, and, in particular, its most measurable components (even if the measures are subjective or perception-based), such as the lack/control of corruption, the strength of the rule of law and bureaucratic quality or government effectiveness. There is such a high correlation amongst these cross-country indicators that comparative scholars have coined the term “quality of government” (QoG) to encapsulate the concept of a government that it is impartial, efficient and non-corrupt (Rothstein and Teorell 2008). Countries with high QoG score higher in almost all dimensions related to the welfare of their citizens (Holmberg, Rothstein and Nasiritousi 2009). QoG has been found – in an extensive and growing literature –to lead, among other, to better economic

performance (Knack and Keefer 1995, Mauro 1995, Mo 2001), higher environmental sustainability (Morse 2006, Welsch 2004), lower income inequality and poverty (Gupta, Davoodi, and Alonso-Terme 2002), better education and health outcomes (Mauro 1998; Gupta, Davoodi, and Alonso-Terme 1998), higher levels of subjective happiness (Frey and Stutzer 2000; Helliwell 2003), and lower probabilities of civil armed conflict (Öberg and Melander 2005).

Despite the importance of these findings, most data and research related to QoG has focused exclusively on the national level, with a particular focus on developing countries. This study focuses exclusively on the 27 Member States of the European Union, arguably all moderately to highly developed countries, yet, at the same time, these countries present noticeable differences in QoG. As a matter of fact, the European Commission has said that improvements in institutional capacity can foster and growth. “Strengthening institutional and administrative capacity can underpin structural adjustments and foster growth and jobs - and in turn significantly improve the quality of public expenditure.” (European Commission 2010). The context of the crisis has further highlighted the need to focus on the quality of public expenditure as the quantity in many Member States will have to be reduced due to fiscal consolidation. As the notable within-EU variations in QoG – at both national and regional level – shown in this study indicate, European policy-makers’ are rightly concerned with institutional and administrative capacity as the quality of public expenditure is probably lower in the EU countries and regions with lower QoG.

Along with presenting national-level estimates, this study presents the largest survey on QoG at sub-national level (with around 34,000 respondents) up to date. By

combining these survey results with the existing national level data by the World Bank (Kaufmann et al 2009), the paper creates with a higher level of reliability than previous efforts in the literature a map of QoG in Europe, covering the variations across 27 countries and 172 EU regions.

The main findings of the paper are the following. First, with the help of the new EU QoG data discussed in the subsequent sections ('e.g. the 'EU-QoG Index'), we find that there is significant variation in QoG across mainly three cluster groups of states: the top performers would mostly be from the Scandinavian, Germanic and English speaking countries; a second group would largely be formed by Mediterranean countries together with Estonia and Slovenia; and the third group would consist of most New Member States plus, notably, Italy and Greece.

However these differences at national level could offer a relatively distorted picture of QoG in Europe in presence of significant sub-national variations in QoG. Previous literature has pointed out in that direction. For example, differences between Northern and Southern Italy are widely known thanks to several influential works (e.g. Putnam 1993), and the divergences between Flanders and Wallonia in Belgium are often debated. Yet such regional differences in QoG in these two countries - and several others - have not been quantified throughout the EU with comparable, cross-country data. The data presented in this paper is thus a pioneering effort to corroborate within-country QoG variations in most European countries simultaneously.

In addition, the *EU QoG Index* at regional level developed here reveals that sub-national variation in QoG is not empirically linked – at least, in a direct and obvious way – with the level of decentralization or the existence of a federalised system. For example,

even in a highly centralised country such as Romania, regions show significant differences among each other regarding policy implementation and the delivery of public services, which, nevertheless, are not decentralized to the regions. On the contrary, some federal states like Austria – where regions have real self-government capacities – show little internal variations. Conversely, both some highly fiscally and administratively decentralized countries like Denmark or Sweden and some highly centralized countries like Slovakia and Poland have no significant regional variation. In sum, the paper shows that sub-national differences in QoG are frequently as relevant as cross-country differences, while the latter are the focus of most the literature. Furthermore, it shows that that these regional divergences do not seem to obey to variations in levels of self-government, which presents an intriguing question for future research.

The descriptive findings presented in this paper have some potential implications for both an academic audience as well as practitioners. Due to the limited scope of a paper and the complexity of a phenomenon with some many feedback effects and endogeneity issues among variables such as QoG (Rothstein 2010), we leave the important “why” questions outside the analysis. For instance, why decentralization leads to more homogeneous regional levels of QoG in some countries and to more heterogeneity in others? Which cultural legacies, economic variables or institutional factors may explain the notable regional differences on how the government delivers its policies? The data presented here can be of use for the scholars addressing this sort of questions fields such as comparative political economy, EU studies, decentralization and regional politics or comparative public administration. In addition, with regions playing such an important role in, for instance, the allocation of EU development funds, the data

presented here can serve as an initial tool of empirical assessment for practitioners interested in regional development policy and aid allocation.

The remainder of the paper is structured as follows. First, we begin the measurement of QoG within the EU with a national-level assessment, using existing data at the national level. Next, we describe the regional level survey undertaken in 172 EU regions from the largest 18 member states. Subsequently, we the combined national and regional QoG data into a QoG index for the entire EU Next, the paper deals with the external validity of the data by showing how the EU-QoG index correlates with several salient socio-economic variables and concludes with several suggestions of important empirical puzzles that could be addressed in the future using this new data.

## **2. Measuring QoG at the national level**

According to the contemporary, national-level data, most indicators demonstrate that QoG, or ‘good governance’ is generally higher on average within the EU-27 member states as compared with other world regions. A closer look however, reveals that there is significant variation *among* many of the countries in the EU. We can see this by analyzing current World Bank governance data and with the help of cluster analysis. Furthermore, we suspect that additional variation will be found *within* several countries that the national level indicators overlook.

However, a serious obstacle to understanding more fully the presence (or absence) of QoG variation within-countries and the different challenges faced by the many regions within the Union stems from a lack of available data. The paper attempts to make a pioneering empirical step in overcoming the lack of data at the sub-national level. We

construct a QoG index for 181 political units (both national and regional level) in the EU, which aptly captures this variation for 172 NUTS 1 and NUTS 2 regions (e.g. *Nomenclature of Territorial Units for Statistics*) in 18 EU member states , along with comparable national level estimates for the 9 remaining member states which were not included in the regional survey. As is the case in most of the cross-national QoG data, our regional level data is built on perceptions of QoG. Hence, we combine the national level data – provided mainly by international investment firms and NGO’s - with the regional-level data, based on the opinions of the citizens, the consumers of QoG in this case.

The first step consists of analyzing the existing national-level data on QoG in Europe. While no comparable QoG indicators exist at the regional level within Europe, fortunately there are several national-level sources of data. Upon thorough review of all available indicators for the countries in the EU 27, we find that the World Bank’s ‘World Governance Indicators’ (WGI) (Kaufmann, Kraay and Mastruzzi 2009 – henceforth ‘KKM’) data would be the most appropriate source on which to build an indicator of QoG for EU countries. First, as opposed to only focusing on one particular concept of QoG, such as corruption, it covers four main, inter-related ‘pillars’ of QoG that we find to be highly salient:

1. *Control of Corruption*
2. *Rule of Law*
3. *Government Effectiveness*
4. *Voice & Accountability*

Second, the WGI covers all EU countries for at least 10 years, going back to the mid 1990’s, and is now published annually each year. Third, it is a ‘composite index’ and it is transparent in the way that it is constructed – publishing freely all underlying



data on which it is built, along with a relatively clear description of the conceptual meaning of each concept and the methodology used to create each variable. Fourth, the theoretical scope of each QoG concept is wide rather than narrow. We believe that unless specified, all aspects of corruption, rule of law, etc. should be included rather than focusing on narrow aspects alone. This allows for more information to be included which is good for reliability checks of the data for example.

As far as the underlying data indicators are concerned, the number of sources varies from country to country in the dataset covering all countries in the world (some small island states have only one source for example for a given pillar while some states have more than 15). However, the advantage of the EU sample is that there are at least 9 common sources for each individual data indicator of QoG for the WGI, and in the case of Rule of Law (RL), there are at least 12 for all countries<sup>1</sup>. The sources of the underlying data are mainly from ‘risk assessment’ institutes or ‘expert’ surveys, yet they do also contain NGO assessments such as *Reporters Sans Frontiers* and *Freedom House*, along with data from government agencies and citizen-based survey data, such as *Gallop World Poll*<sup>2</sup>.

We ranked the 27 EU countries according to each of the 4 areas of QoG listed above. All underlying data for the WGI, along with the weighting schemes use by KKM, are available freely online<sup>3</sup>. However, we were uncertain about the robustness of the data. Thus we took all data used to construct these four QoG indices for the year 2008, replicated the original results, and conducted extensive sensitivity tests and

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<sup>1</sup> The exception here is Cyprus, Luxembourg and Malta, for which some sources were missing.

<sup>2</sup> For a full description of the WGI composite indicators, their construction and underlying data, see Kaufmann, Kraay and Mastruzzi (2009).

<sup>3</sup> <http://info.worldbank.org/governance/wgi/index.asp>

internal/external consistency checks on each of the four areas of QoG. After running a total of 264 simulations, whereby we altered the original weighting scheme, aggregation method and removing individual data sources one at a time, we found the data to be remarkably robust to changes, along with being strongly internally consistent<sup>4</sup>. After confirming the robustness of the original estimates for each of the 4 composite indices, we then combined the 4 indices to create a combined, national-level ‘QoG index’. The results of which can be seen in Table 1.

*\*\*\*Table 1 about here\*\*\**

We used cluster analysis to assess the national level variance in QoG across EU countries. According to the WGI’s own margins of error, QoG differences between countries like Denmark and Finland, or Czech Republic and Hungary are indistinguishable. The cluster groupings can therefore serve as a helpful tool to identify EU member states that share common challenges to building QoG at the national level. We employed hierarchical clustering using Ward’s method and squared Euclidian distancing for the four pillars of QoG to identify the number of appropriate cluster groupings. Three distinct groups were detected in the analysis. We then used k-means clustering with squared Euclidian distancing to assign each country to a cluster. The results show mainly that with some exceptions, there are certainly geographic and historic similarities to the countries within each group.

*\*\*\*Table 2 about here\*\*\**

Without claiming that these groups are ‘etched in stone’, the data tell us that cluster 1 countries exhibit significantly the highest levels of QoG in Europe, while cluster 2 and cluster 3 show, respectively, a moderate and low performance in QoG. According to this

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<sup>4</sup> For a more in depth look at the results of the sensitivity test, please see Charron (2010).

picture based on aggregate national data, there thus seems to be three Europes with respect to QoG: a first one with top performers mostly from Scandinavian, Germanic and Anglo-Saxon countries; a second one with most Mediterranean countries plus the two best performers in Central-Eastern Europe (Estonia and Slovenia); and a third one which would cover most post-communist EU members and, significantly, two Western European countries such as Italy and Greece.

### **3. Measuring QoG at the Regional Level**

While certainly relevant as a starting point, the national level cluster groups do not tell the whole story. National-level data has of course proliferated in recent years, yet measuring QoG at the regional level within most countries is ‘uncharted territory’, let alone measuring regional QoG across a number of states simultaneously. Several recent surveys have been launched by *Transparency International* in Mexico and India to build measurements of citizen perceptions of corruption at the regional level. However, in most countries, in particular those in the Europe, such data do not exist and those that do are more narrowly focused on capturing corruption, mostly in Italy (Del Monte and Papagni 2007; Golden and Picci 2005).

In order to add to the necessary nuance to the national level, WGI data, we take advantage of data acquired for a large, EU Commission-funded project on measuring quality of government within the EU<sup>5</sup>. We began with a survey of approximately 34,000 EU citizens, which constitutes the largest survey ever undertaken to measure QoG at the sub-national level to date. Then, a regional-level QoG index score for 172 NUTS 1 and

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<sup>5</sup> ‘Measuring Quality of Government and Sub-national Variation’ Report for the EU Commission of Regional Development *European Commission Directorate-General Regional Policy Directorate Policy Development*. 2010

NUTS 2 regions within 18 EU countries was built based on survey questions on citizen perception of QoG<sup>6</sup>. As a compliment to national level QoG data, our citizen-based offers a source of information that is not subject to the common criticism that existing data is biased toward ‘business friendly’ environments (see Kurtz and Shrank 2007). A more detailed description of the survey is located in the appendix.

In attempting to capture the most relevant sub-national variation in QoG possible, we focused exclusively on three public services that are most often financed, administered or politically accounted for by sub-national authorities. These are education, health care and law enforcement. While not perfect – regions in different countries have different administrative and fiscal responsibilities -, these are most often the public services that are most likely to be either administered or financed by regional governments (or both), thus maximizing regional variation where applicable. We intentionally avoided questions about public areas such as defense or immigration as these are handled at the central level. We asked respondents to rate these three public services with respect to three related concepts of QoG – the *quality*, the *impartiality* and the level of *corruption* of said services.

We acknowledge that some critics might argue that administrative and political responsibility of the regions varies in different countries and thus this is problematic. We argue otherwise. We seek to capture all regional variation within a country and as noted, the provision and quality of public services can vary within even a highly centralized country, for example if the distribution of public employees with a higher education is

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<sup>6</sup> NUTS 1 regions are from Germany, U.K., Sweden, Hungary, Greece, Netherlands and Belgium. NUTS 2 countries are Italy, Spain, Portugal, Denmark, Cz. Republic, Poland, Romania, Bulgaria, Slovakia, France, and Austria.

highly skewed. The complete survey can be found in the appendix. The questions specifically used in building the QoG regional data are shown in the appendix.

Figure 1 shows the results of the regional QoG index for 172 EU regions. A quick examination of the data reveals fairly predictable patterns among the regions with respect to QoG. All regions within the top performing EU members with regard to the national QoG index (Denmark, Sweden and Netherlands) are in the top 15% of all 172 regions. Among the NMS, all but one of regions are in the bottom 50% (i.e. have a score lower than '0'), with the only exceptions being Nord Vest (0.22) in Romania. In contrast, most of the EU 15 regions are in the top 50%, with Portugal and Greece being the only exceptions having all of their respective regions under the mean average. Moreover several of the regions in France and Italy are under the EU mean, with the later containing two in the bottom 10%.

*\*\*\*Figure 1 about here\*\*\**

As with the national-level data, we perform internal consistency checks and a sensitivity test to the index. Chronbach's Alpha correlation test, pairwise correlations and a principle component factor analysis demonstrate the data to be highly internally consistent<sup>7</sup>. We performed 62 simulations in which the sensitivity of the data was tested using factor weights and geometric aggregation in addition to equal weighting and additive aggregation, while we removed each individual question as well as whole question-groups (e.g. all questions pertaining to 'quality', 'impartiality' or 'corruption'). In addition, for several simulations, we re-aggregated the data from the individual level whereby we excluded certain demographic groups, such as men, high income

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<sup>7</sup> Chronbach's Alpha coefficient of reliability was 0.94, while 89% of the pairwise correlations among the 16 questions were positive and significant. The principle component analysis (PCA) demonstrated that the questions factored together according to QoG concepts of corruption, impartiality and quality.

respondents, young respondents, higher educated respondents and those who did not have any interaction with any of the public services in question within the last 12 months. We found that even in the most extreme scenarios, the Spearman Rank Coefficient never fell below 0.90 and than the median shift in the rankings was never above 11. This shows that the regional data and scores are robust and internally consistency.

#### **4. Combining the Two Levels of Data - The EU QoG Index**

Although the entire sample of respondents in the regional level survey is large (34,000), the number of respondents per region is on the smaller side (200). Thus we seek to add credible and robust observations to the regional level data to compensate for any outlying region or country in the regional survey. To accomplish this – along with including the nine other EU countries in the sample (e.g. including those countries with only one NUTS 2 region, such as Estonia or Slovenia) - we elect to combine the WGI external assessment with our citizen-based, regional level data to create a comprehensive ‘*EU QoG Index*’. Our aim was to come up with a method that mostly fairly includes the omitted EU countries from the survey while simulateneously maintinnig the richness of the within-country variation in several of the countries surveyed in the regional-level study. In order to make the comparisons most meaningful, we employ the following formula to calculate each unit’s adjusted scores (whether regional or country):

$$WBCountryScore_{CountryY} + (QoGScore_{regionXinCountryY} - CountryScore_{CountryY})$$

Where we essentially take the country average from the WGI data from Table 1, standardize it for the EU sample, and set each country’s mean score to that level. For countries outside of the survey, there is nothing to add to the WGI Country score, thus

this national-level data is used as the QoG estimate alone, and regional variation is unobserved. With respect to countries with the regional data, we set the national average using the WGI and explain the within-country variance using the regional-level data. Simply speaking, we aggregate the un-weighted, average regional QoG score (e.g. '*CountryScore*<sub>CountryY</sub>') for each of the 18 countries in the survey and this is subtracted from each region's individual score, which is then added to the national level data, so each region has an adjusted score, centred around the WGI. We feel that this method makes best use of both national and regional data; combining our citizen survey with the opinions of the mainly expert, NGO and IGO data of the World Bank. After calculating the scores for all of the regions, we then standardize them one more time, and the results of which are shown in Figure 2.

Although the national level data and regional level data are indeed directed at different levels of government – the WGI taps into the quality of national public sector, while the regional survey was explicitly asking respondents about their regional service – we argue that these two measures are indeed similar enough to combine. First and most obviously, they are both capturing aspects of concepts such as corruption, quality of services, impartiality, and rule of law. While the national data might be focused on several sectors of the national bureaucracy that are not measured by the regional level data – e.g. defence, immigration, etc. – we do not find this problematic. While administrative and fiscal responsibilities vary from region to region in the EU, such areas of the public sector are out of the realm of all regional governments, thus it is most appropriate that we do not include them in any regional studies. Second, the national averages to the WGI are robust, well-established, and internationally used measures, are

thus suited to estimate the country-level scores. In adjusting the national level scores of the states, we sacrifice none of the rich sub-national variation from the regional level survey data.

*\*\*\*Figure 2 about here\*\*\**

Figure 2 shows the combined data between the WGI national-level QoG scores and the regional QoG data and Figure 3 shows the national averages with the within-country range of scores. A full list of scores for each region and country is located in the appendix. The data show that 11 out of 15 EU-15 states have all their regions and/or national scores above the EU average, while all regional and national-level scores for the New Member States (NMS) are under the mean average<sup>8</sup>. Three EU-15 countries – Italy, Spain and Portugal– contain regions that are both above and below the mean score, while Greece is the only EU-15 country to have all of its regions below the mean level of QoG in the EU. Among the NMS, the Czech Republic has regional variation above and below the EU mean, while all others have all regions below the EU mean QoG score.

*\*\*\*Figure 3 about here\*\*\**

For more useful comparisons across regions, we construct a margin of error at the 95% confidence level. This level equates to the probability that a margin of error around the reported QoG estimate for each region would include the "true" value of QoG or, in other words, that the margin of error tells us that we can say with about 95% confidence that a region's estimate of QoG can be found within a plus/minus 1 margin of error<sup>9</sup>.

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<sup>8</sup> However, on specific combined pillars, such as RL or GE, several regions in the Czech Republic are above the EU mean score

<sup>9</sup> We know from basic statistical probability that in a sample 'x', 95% of the area of a basic normal Bell curve are between our estimate ( $\mu$ ) 1.96+/- the standard error around  $\mu$ . We calculate the standard error as:

S.E. =  $\frac{\sigma}{\sqrt{n}}$ . The margin of error for each individual region is based around the QoG estimate:



Three of the regions that showed the largest margins of error are Bucharesti (0.69), Sud Vest (0.55) and Galacia (0.52), which means that they all have a confidence interval that spans over a full standard deviation in the data due to relatively high/low scores compared with their final QoG regional index estimate. The lowest margin of error belongs to the Polish region of Kujawsko-Pomorskie (0.166), meaning that we can be about 95% sure that the true estimate lies within a confidence interval of about one-third of a standard deviation around our current QoG estimate for this region. Spanish regions on whole have high margins of error due to a general trend among respondents to rate their region very high with respect to impartiality questions, although relatively low regarding quality of services. Danish and Polish regions on whole have the tightest confidence intervals. All margin of errors around the regional estimates are found in the appendix.

## **5. The Relevance of National and Within-Country Variation of QoG in the EU**

Based on the margins of error around the regional estimates, we are now prepared to make more meaningful comparisons of QoG in the EU. The data reveal several striking characteristics at first glance. Using the margins of error for the estimates provided by the WGI for the country level data, we see that differences between pairs of countries like the Netherlands and Denmark, Belgium and Portugal, or Czech Republic and Poland are negligible. However, in several countries, such as Italy, Spain, Belgium, Portugal,

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$1.96 \pm \left( \frac{\sigma}{\sqrt{n}} \right)$  with  $N = 16$ , because there are 16 indicators in the QoG index which have been aggregated from the survey data. Each region thus has their own individual margin of error based on the consistency of the estimates for each of the 16 aggregated questions in the survey. We end up with an average margin of error of 0.338, or about one third of a full standard deviation, with a minimum of 0.166 to a maximum of 0.691.

France, Romania, Czech Republic and Bulgaria have multiple significantly different regions according to the regional-level margins of error while Greece, U.K., Poland, Hungary and Germany have one significant difference (e.g. the only significant within-country different is between the high and low region). The five other countries included in the regional survey showed no significant within-country QoG variation, meaning that all regions' margins of error overlap.

Interestingly, the data show clearly that within-country QoG variation is at times equally or more important than cross-country variation. For example, Figure 3 shows the rank-order of EU countries (again, using the WGI, national assessment as the country mean). For example, the gap between Bolzano (IT) to Campania (IT) in the data is much larger than then the gap of the national averages between Denmark and Portugal for example. Further, while the national gap between Bulgaria and Romania at the national level is negligible from one another, their national scores are significantly lower than the national scores of other states such as Slovakia, Poland, Italy and Greece. However the top region from each country (Nord Vest (RO11) in Romania and Severoiztochen (BG33) in Bulgaria are statistically indistinguishable from lower ranking regions within those other four countries.

In addition, what the data reveal is that for countries such as Denmark, Slovakia or Poland, national estimates (like the WGI) more or less capture aptly the level of QoG in the country; as there is such little within-country variation from region to region. However, in countries such as Belgium, Spain, Portugal, or Italy, the variation is quite significant, and thus the national-level data tend to overestimate poorer performing regions while underestimate better performing regions.

Although mostly untested empirically due to a lack of empirical data at the regional level, several scholars have asserted that greater levels of decentralization lead to larger disparities from region to region with respect to variables such as bureaucratic quality or corruption in the public sector (Tanzi 1996, 2001; Brueckner 1999; Prud'homme 1995; Ghai and Regan 1992). However, another striking feature of the data is that there appears to be no clear link between the level of decentralization and/or federalism and the amount of within-country variation of QoG. Maybe unsurprisingly due to intentionally harmonized policy at the central level in many policy areas, federal countries like Germany and Austria demonstrate only moderate to low levels of within-country variation of QoG. Yet Belgium has enormous variation between Flanders – which performs on par with regions from Sweden, Denmark and the Netherlands – and Wallonia and Brussels regions, which perform much closer to regions in France, Spain or Portugal according to the data. Semi-federal states such as Italy or Spain also have wide within-country regional variation. On decentralization, most measures show that countries like Sweden and Denmark are highly fiscally and administratively decentralized<sup>10</sup>, yet they demonstrate very little within-country variation among regions.

On the other hand, some highly centralized countries such as Romania and Bulgaria demonstrate fairly wide within-country variation, with a few aforementioned regions overlapping regions in Poland, Slovakia, Hungary, Italy and Greece and others such as Severozepaden (BG31) and Bucharest (RO32) are found among the three lowest-ranking regions in Europe with respect to QoG. Moreover, Portugal, another highly centralized county according to most measures, also displays high regional variation, while a

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<sup>10</sup> Treisman (2003) reports several indicators from the the IMF on fiscal decentralization, such as the percentage of sub-national revenues and expenditures as a proportion of total revenues and expenditures. Sweden and Denmark are the two most decentralized countries with respect to these measures.

centralized country like Slovakia has no significant sub-national variation. This gives some credence to the hypotheses that within country QoG variation may also hinge on the distribution of quality employees and/or execution of policy and services as a federal structure.

The primary purpose of this study was to present the new data for scholars of the European Union, comparative politics and/ or decentralization and federalism, thus it is outside the scope of this article to put forth any casual mechanisms as to why such sub-national variation exists in some countries while in others it is negligible. However, based on the recent and growing empirical literature on national level QoG and its correlates, this sections presents some correlations between the newly created index and several salient socio-economic variables. This is both for the purpose of demonstrating external validity of the data and to show its potential usefulness to scholars interested in this field of research. It is worth noting of course that until now, such regional-level QoG analyses were not possible to perform.

We keep this portion of the analysis as simple as possible reporting only correlations, but again, we do not attempt to offer comprehensive empirical analyses or theoretical explanations of the underlying causal mechanisms of these patterns here. There are intense debates in the literature on up to which extent QoG is the result or the cause of a large number of socio-economic and political factors (e.g. see Rothstein and Uslaner 2005 for an initial in-depth discussion of these issues and Rothstein 2010 for a more recent review). Therefore, a meaningful contribution to the literature on why some governments perform better than others which took into account all the potential

feedback and endogeneity problems would require more space – and a different focus – than what this paper can offer now.

At the national level of study, much recent research has pointed to a broad scope of empirical correlates with factors that fit in the QoG framework, such as indicators of rule of law or corruption for example and we seek to show several of these well established empirical linkages here. First, scholars have consistently found a strong empirical connection between reaching a higher levels of economic development and higher levels of various measures of QoG (Acemoglu, Johnson, and Robinson 2002, 2004; Knack and Keefer 1995; Mauro 1995; Holmberg, Rothstein and Nasiritousi 2008). Moreover, several scholars have reported that higher levels of QoG are strongly related with lower levels of income inequality (Gupta, Davoodi, and Alonso-Terme 2002). Furthermore, QoG variables are positively related with indicators of macro-level indicators of health in society (Mauro 1998; Gupta, Davoodi, and Alonso-Terme 1998; Holmberg, Rothstein and Nasiritousi 2008). Other variables whose correlations with QoG we would like to explore are the regional population, its density and size of the geographical area of the region itself. Several studies have examined these factors – or equivalent ones – with, generally speaking, mixed results on their importance to explain differences in QoG (Knack and Azfar 2003; Alesina 2009). Finally, we test the level of correlation between several indicators of technological development and QoG, as several studies have explored previously (Miller 2001; Kenny 2002).

*\*\*\*Table 3 about here\*\*\**

Table 3 explores first a group of variables indicating size of a region – in terms of both area and population. Interestingly, and although one could suspect these variables to

be related in some way with our perception-based measure of QoG, there is no significant correlation between measures of population, population density or area size and the EU QoG index. In order to double-check the possibility of some correlations, we test the logged variables as well and find no significant result.

Moving to indicators of development, table 3 shows that all such measures correlate at the 99% level of significance with QoG. We include standard indexes such as GDP per capita (measured in PPP, both logged and non-logged), two indicators of unemployment – the youth unemployment rate and the long-term unemployment rate – along with a Theil Index of regional-level wage inequality from Galbraith and Garcilazo (2005). QoG is associated with higher unemployment rates and higher levels of wage inequality in EU regions. Finally, we find a strongly positive and significant correlation between QoG and an indicator of skilled labor - the percentage of the workforce that holds a tertiary level education (e.g. post-secondary training) or higher.

As regards to technology, we find that QoG is strongly correlated with the access to internet, aggregate-levels of households with computers along with the number of research and development (R&D) workers per capita in a region. Finally, our measure of QoG is strongly (negatively) correlated with two standard proxies for the quality of health care for which data is available at regional level – the infant mortality rate and the number of heart disease deaths for the population under 65.

## **7. Conclusions**

The data and analysis presented in this paper make the following contributions to the literature. First and foremost, the paper has mapped the differences in perceived levels of

quality of government among 172 EU regions based on the perception of citizens, which, in combination with the external, largely expert assessment of the national level data, represents the most encompassing data up to date on sub-national variation in corruption or good governance variables.

The paper has found a notable amount of variation both *between* and *within* EU countries. On the former, the Northern European countries tend to show the highest levels of QoG, distinguishing themselves from two groups also statistically differentiable: a group encompassing most Southern-Mediterranean states and another group covering the majority of new member states that, with the exception of Estonia and Slovenia, present the lowest levels of QoG in the EU. On the later, significant within-country variations can be found in federal or semi-federal nations such as Italy, Belgium or Spain, but also, noticeably, in more centralized ones, such as Portugal, Romania or Bulgaria. Other countries, like Denmark, Poland, Austria or Slovakia show very little variation across regions.

Although many more empirical relationships can be explored in future research, the basic correlation analysis showed that the QoG index is strongly correlated with crucial socio-economic variables such as GDP per capita, infant mortality rates, internet availability, or long-term unemployment, all of which play a vital role in the lives of EU citizens. Thus the data created here can serve many purposes ranging from policy-makers assigning regional development aid to scholars employing the data to test a number of hypotheses at the sub-national level of analysis on why in some regions governments seem to perform better than in others.

We would like to conclude by underscoring the importance of focusing on QoG not only in developing regions of the world but inside the EU. As this study has shown, still too many EU residents report to have first hand experience of corruption and discrimination and the share of residents confronted with these issues is far higher in some regions and countries. All in all, we have seen that QoG in the EU varies significantly between countries and between regions within these countries. Wherever it is low, it leads to stunted economic growth, blocked ambitions and sometimes shortened lives. Much remains to be done to achieve a uniformly high level of QoG in all regions of the EU. With much attention going to regional development from the EU Cohesion policy for example, the data and recommendations presented here can be a valuable policy tool for both practitioners and scholars alike interested in studying sub-national level development. We argue that a joint and targeted effort to improve QoG in those regions with lower levels could substantially improve the economic prospects of these regions and the lives of their residents.

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**Table 1: National Level Scores and Rankings of QoG in the EU 27**

<i>QoG Rank</i>	<i>Country</i>	<i>Comb. WGI</i>
1	DENMARK	1.98
2	SWEDEN	1.93
3	FINLAND	1.91
4	NETHERLANDS	1.83
5	LUXEMBOURG	1.75
6	AUSTRIA	1.71
7	GERMANY	1.64
8	U.K.	1.63
9	IRELAND	1.6
10	FRANCE	1.41
11	BELGIUM	1.37
12	MALTA	1.26
13	SPAIN	1.12
14	PORTUGAL	1.08
15	CYPRUS	1.08
16	ESTONIA	1.02
17	SLOVENIA	0.96
18	CZ. REPUBLIC	0.81
19	HUNGARY	0.76
20	SLOVAKIA	0.62
21	LITHUANIA	0.58
22	GREECE	0.57
23	LATVIA	0.55
24	POLAND	0.55
25	ITALY	0.48

26	BULGARIA	0.08
27	ROMANIA	0.04

Note: 'Comb. WGI' shows the combined averages of the 4 pillars of QoG from the WGI. It is standardized so that the world average is '0' with a standard deviation of '1'. QoG rank is within the EU countries only, thus Estonia for example is roughly one full standard deviation above the world average.

**Table 2: Clusters of EU Countries (ranking order) Based on 4 Areas of QoG**

Cluster 1 n=9	Cluster 2 n=8	Cluster 3 n=10
DENMARK	FRANCE	CZECH REPUBLIC
SWEDEN	BELGIUM	LITHUANIA
FINLAND	MALTA	HUNGARY
NETHERLANDS	SPAIN	SLOVAKIA
AUSTRIA	PORTUGAL	POLAND
GERMANY	CYPRUS	LATVIA
UNITED KINGDOM	ESTONIA	GREECE
IRELAND	SLOVENIA	ITALY
LUXEMBOURG		BULGARIA
		ROMANIA

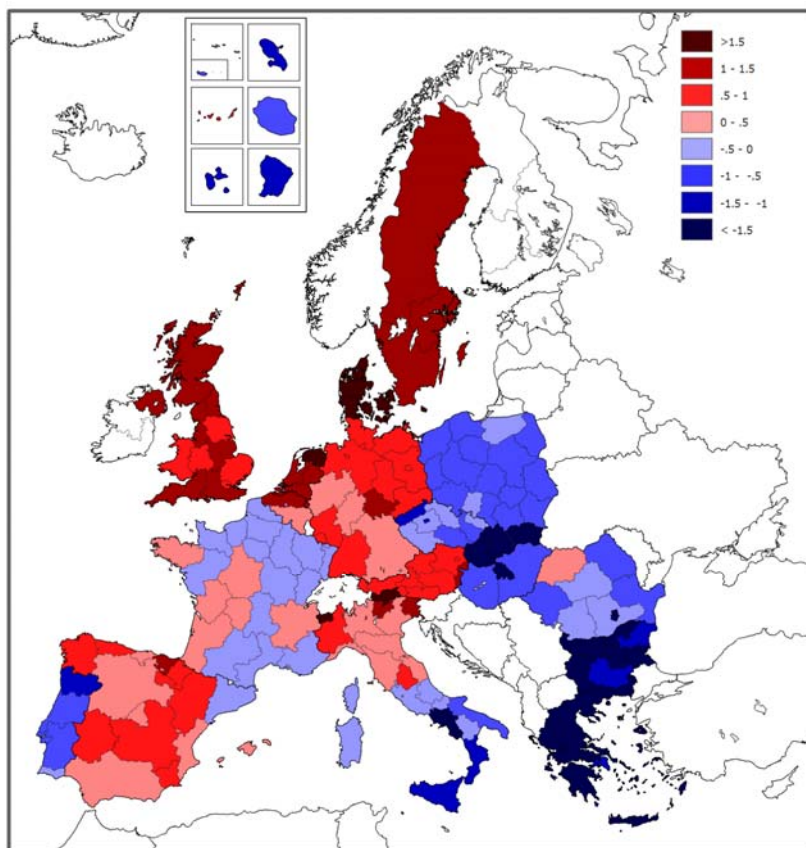
**Table 3: Correlates of the EU QoG Index**

	Demographic & Region Characteristics	Development Indicators	Technology Indicators	Health Indicators
<i>Population</i>	0.09			
<i>pop. (Log)</i>	0.004			
<i>Pop. Density</i>	0.08			
<i>Area</i>	0.06			
<i>Capital region</i>	-0.05			
<i>EU 15</i>	0.59***			
<i>PPP per cap.</i>		.59***		
<i>PPPp.c. (Log)</i>		.65***		
<i>Youth unemployment</i>		-.66***		
<i>L.T. unemployment (24-65)</i>		-.31***		
<i>Income inequality</i>		-.52***		
<i>% Tertiary Education</i>		.61***		
<i>% Internet</i>			0.78***	
<i>% R&amp;D workers</i>			0.68***	
<i>% no computer</i>			-0.80***	
<i>Infant Mortality rate</i>				-0.58***
<i>Heart Disease Deaths</i>				-0.66***

*Note:* Person-pairwise correlations reported. 'GDP p.c.' is the purchasing power standard (current market value, 10-year average). 'L.T. Unemployment 24-65' is the long term unemployment rate for people between the ages of 24 and 65. %Tertiary Education is the percentage of the workforce with a tertiary education or higher. '% R&D' is the percentage of research and development workers in the region/country. 'Infant mort' rates are measured as the number of infant mortality deaths per 10,000. '%internet' is the percentage of people with access to internet at home. Population is the log of the total population. Heart Disease Deaths is the standardised death rate from heart disease for population under 65, 2006-2008. All data taken from Eurostat is averaged over a 10-year period (1999-2008).

\*\*\*  $p < .01$ ,

**Figure 1: The Regional Level Data**



**Figure 2: The EU QoG Index**

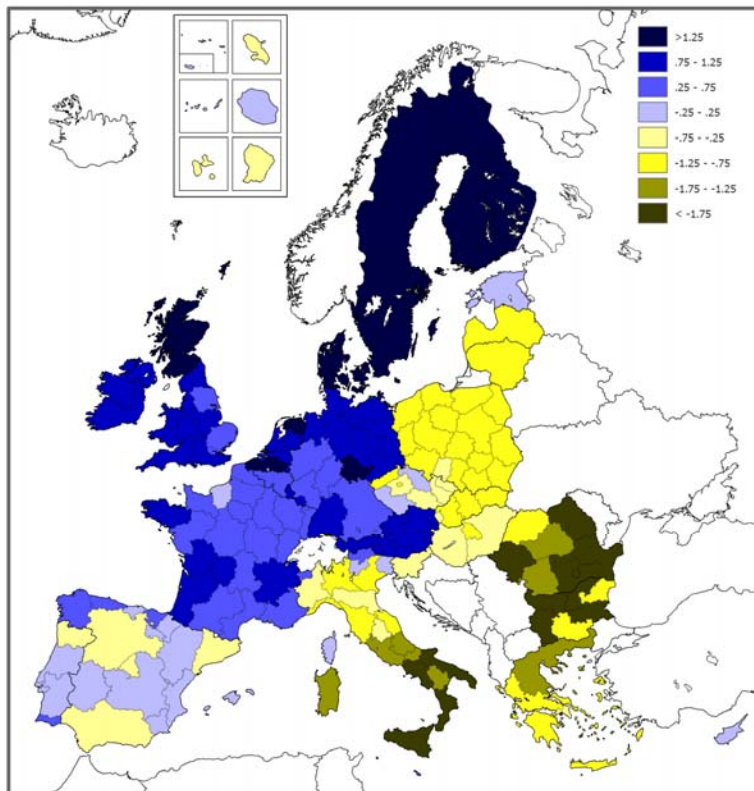
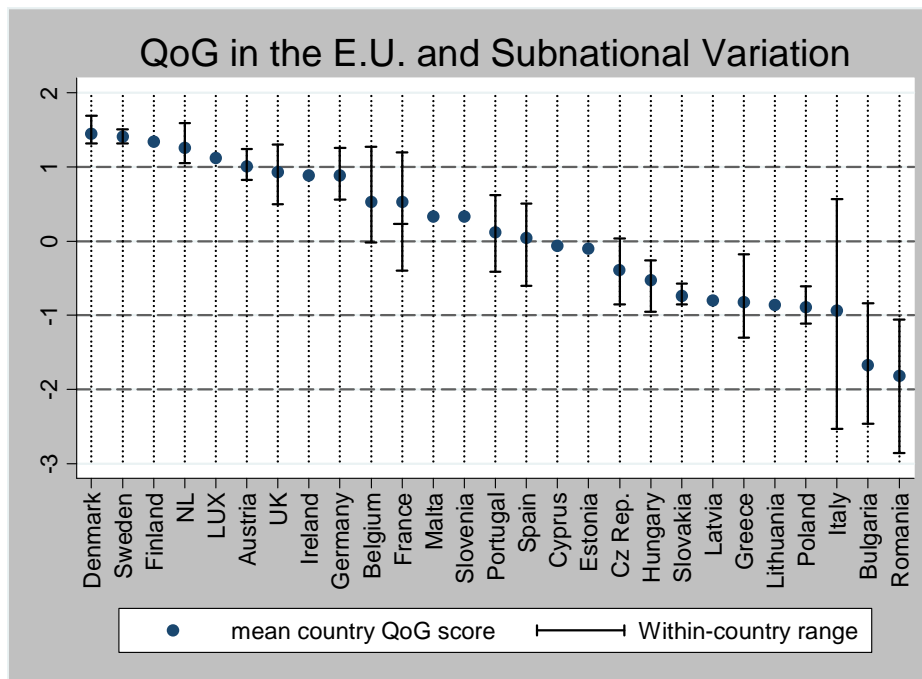




Figure 3:



## Appendix 1: description of Sub-National survey and data construction

The EU regional survey was undertaken between 15, December, 2009 and 1 February, 2010 by *Efficiencie 3*, a French market-research, survey company. The respondents, ranging from 18 years of age or older, were contacted randomly via telephone in the local language by the ‘birthday method’ with replacement. As Longstreth, and Shields (2009) find, although not as demographically representative as the ‘quota method’, the birthday method obtains a reasonably representative sample of the population while providing a better distribution of opinion.

In trying to capture any regional variation within a country, we asked 34 QoG and demographic based questions to the approximately 200 respondents per NUTS region. Regarding the QoG questions, the respondents were asked about three general public services in their regions – education, health care and law enforcement. Publically administered areas such as immigration, customs or national security were intentionally avoided because these are dealt with at the national or even supranational level. In focusing on these three services, we asked respondents to rate their public services with respect to three related concepts of QoG – the *quality*, *impartiality* and level of *corruption* of said services<sup>11</sup>. In addition we included two further questions in the index – one about the fairness of regional elections and the other about the strength and effectiveness of the media in the region to expose corruption.

In constructing the regional level data, we followed the advice of the “*Handbook on Constructing Composite Indicators*” (2008) from the OECD and JRC. After many internal consistency checks and tests at both the individual and aggregate regional levels, we ran correlations and factor analysis and determined 16 of the survey questions on QoG would be used to build the regional QoG index. For the sake of simplicity and easier replication, we first standardize each question<sup>12</sup> and aggregated the individual-level responses to the regional level, taking the simple mean. To combine the 16 questions into one index for each region, we used equal weighting and arithmetic aggregation. We standardize the data so that the mean is ‘0’ with a standard deviation of ‘1’.

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<sup>11</sup> These are related concepts which have come up frequently in the comparative QoG literature, thus we try to include citizens’ opinion regarding all three, for more, see Holmberg, Rothstein and Nasturosi (2009).

<sup>12</sup> Questions are standardized due variations in the range of response (i.e. ‘0-10’, ‘0-4’, ‘yes/no’, etc.)

## Survey Questions Incorporated in the Regional QoG Index

### **Rule of Law-Focused Questions**

"How would you rate the quality of the police force in your area?" (low/high, 0-10)

"The police force gives special advantages to certain people in my area." (agree/disagree, 0-10)

"All citizens are treated equally by the police force in my area" (Agree, rather agree, rather disagree or Disagree, 1-4)

"Corruption is prevalent in the police force in my area" (agree/disagree, 0-10)

### **Government Effectiveness-focused questions**

"How would you rate the quality of public education in your area?" (low/high 0-10)

"How would you rate the quality of the public health care system in your area?" (low/high 0-10)

"Certain people are given special advantages in the public education system in my area (agree/disagree, 0-10)

"Certain people are given special advantages in the public health care system in my area." (agree/disagree, 0-10)

"All citizens are treated equally in the public education system in my area" . " (Agree, rather agree, rather disagree or Disagree, 1-4)

"All citizens are treated equally in the public health care system in my area" . " (Agree, rather agree, rather disagree or Disagree, 1-4)

### **Voice & Accountability-focused questions**

"In your opinion, if corruption by a public employee or politician were to occur in your area,

how likely is it that such corruption would be exposed by the local mass media?" (unlikely/likely, 0-10)

"Please respond to the following: Elections in my area are honest and clean from corruption" (agree/disagree, 0-10)

### **Corruption-Focused Questions**

"Corruption is prevalent in my area's local public school system (agree/disagree, 0-10)

"Corruption is prevalent in the public health care system in my area" (agree/disagree, 0-10)

"In the past 12 months have you or anyone living in your household paid a bribe in any form to:

Health or medical services?" (yes/no)

"In your opinion, how often do you think other citizens in your area use bribery to obtain public services?" (never/very often, 0-10)

## **Appendix 2: EU QoG Index with Margins of Error**

<u>NUTS Code</u>	<u>Region</u>	<u>EU QoG Index</u>	<u>S.E.</u>	<u>min</u>	<u>max</u>
AT11	AT_Burgenland	1.24521	0.184969	1.06024	1.430179
AT12	AT_Lower Austria	0.967728	0.210921	0.756808	1.178649
AT13	AT_Vienna	0.98951	0.24213	0.7473806	1.23164
AT21	AT_Carinthia	1.13204	0.260895	0.8711402	1.392931
AT22	AT_Styria	0.825754	0.203061	0.6226935	1.028815

AT31	AT_Upper Austria	0.883877	0.170733	0.7131436	1.05461
AT32	AT_Salzburg	0.856572	0.211227	0.6453443	1.067799
AT33	AT_Tyrol	1.11136	0.255512	0.8558455	1.366869
AT34	AT_Vorarlberg	1.04341	0.249902	0.7935072	1.293311
BE1	BE_Brussels-Capital Region	-0.018374	0.401287	-0.4196615	0.3829132
BE2	BE_Flemish Region	1.27242	0.467462	0.8049579	1.739882
BE3	BE_Walloon Region	0.337747	0.344849	-0.0071015	0.682596
BG31	BG_Severozapaden	-2.46142	0.418835	-2.880258	-2.042588
BG32	BG_Severen tsentralen	-1.96389	0.528717	-2.492604	-1.435171
BG33	BG_Severoiztochen	-0.835811	0.255895	-1.091707	-0.5799159
BG34	BG_Yugoiztochen	-2.04246	0.380321	-2.422776	-1.662135
BG41	BG_Yugozapaden	-1.73656	0.358962	-2.09552	-1.377597
BG42	BG_Yuzhen tsentralen	-1.00568	0.308359	-1.314036	-0.6973182
CYPRUS	CY_Cyprus	-0.067572			
CZ01	CZ_Prague	-0.847407	0.427903	-1.27531	-0.4195037
CZ02	CZ_Central Bohemian Region	-0.17927	0.410925	-0.5901955	0.231655
CZ03	CZ_Jihozápad (Southwest)	0.032461	0.34583	-0.3133695	0.3782912
CZ04	CZ_Severozápad (Northwest)	-0.853366	0.475445	-1.328811	-0.3779216
CZ05	CZ_Severovachod (Northeast)	-0.066455	0.309828	-0.3762828	0.2433726
CZ06	CZ_Jihovachod (Southeast)	-0.392497	0.331134	-0.7236311	-0.0613629
CZ07	CZ_Steední Morava (Central Moravia)	-0.484559	0.375791	-0.8603498	-0.1087674
CZ08	CZ_Moravian-Silesian Region	-0.314155	0.404391	-0.718546	0.0902364
DE1	DE_Baden-Württemberg	0.911664	0.306463	0.6052015	1.218127
DE2	DE_Bavaria	0.647061	0.332838	0.3142223	0.979899
DE3	DE_Berlin	0.911567	0.361154	0.5504135	1.27272
DE4	DE_Brandenburg	0.909683	0.377331	0.5323524	1.287014
DE5	DE_Bremen	0.884354	0.302349	0.5820053	1.186703
DE6	DE_Hamburg	0.892336	0.291172	0.6011639	1.183507
DE7	DE_Hessen	0.566761	0.269973	0.2967877	0.8367344
DE8	DE_Mecklenburg-Vorpommern	0.880592	0.287196	0.5933958	1.167788
DE9	DE_Lower Saxony	0.86861	0.29522	0.5733898	1.16383
DEA	DE_North Rhine-Westphalia	0.649414	0.344624	0.3047904	0.9940374
DEB	DE_Rhineland-Palatinate	0.759893	0.236555	0.5233378	0.9964481
DEC	DE_Saarland	0.981332	0.326151	0.6551808	1.307482
DED	DE_Saxony	1.02502	0.287063	0.7379615	1.312088
DEE	DE_Saxony-Anhalt	0.79844	0.343202	0.4552377	1.141641
DEF	DE_Schleswig-Holstein	1.19937	0.350467	0.8489038	1.549838
DEG	DE_Thuringia	1.26162	0.376833	0.8847875	1.638453
DK01	DK_Hovedstaden	1.32036	0.349469	0.9708959	1.669833
DK02	DK_Sjælland	1.46039	0.358202	1.102183	1.818587
DK03	DK_Syddanmark	1.45194	0.248999	1.202942	1.70094
DK04	DK_Midtjylland	1.69493	0.268246	1.426684	1.963176
DK05	DK_Nordjylland	1.3313	0.326877	1.004426	1.65818
ES11	ES_Galicia	0.413978	0.523689	-0.1097114	0.9376674
ES12	ES_Asturias	0.352286	0.482956	-0.1306693	0.8352418
ES13	ES_Cantabria	-0.010656	0.453844	-0.4645002	0.4431877
ES21	ES_Basque Community	0.503343	0.396789	0.1065542	0.9001327
ES22	ES_Navarre	0.018516	0.340154	-0.3216378	0.3586697
ES23	ES_La Rioja	0.087531	0.51451	-0.4269791	0.6020418
ES24	ES_Aragon	0.163518	0.418101	-0.2545831	0.5816199
ES30	ES_Madrid	-0.247973	0.475226	-0.7231987	0.2272536

ES41	ES_Castile-Leon	-0.205311	0.462443	-0.6677544	0.2571318
ES42	ES_Castile-La Mancha	0.053168	0.408007	-0.3548395	0.4611753
ES43	ES_Extremadura	0.257719	0.397725	-0.1400055	0.6554436
ES51	ES_Catalonia	-0.608302	0.436637	-1.044939	-0.1716643
ES52	ES_Valencian Community	-0.000401	0.414206	-0.4146074	0.4138049
ES53	ES_Balearic Islands	-0.044622	0.428495	-0.4731168	0.3838732
ES61	ES_Andalusia	-0.346923	0.428444	-0.7753667	0.0815213
ES62	ES_Region of Murcia	0.127813	0.439706	-0.3118933	0.5675184
ES70	ES_Canarias	0.116667	0.466744	-0.3500766	0.5834115
ESTONIA	EE_Estonia	-0.101101			
FINLAND	FI_Finland	1.33853			
FR10	FR_ille de France	0.7194	0.372864	0.3465368	1.092264
FR21	FR_Champagne-Ardenne	0.363253	0.339619	0.0236346	0.702872
FR22	FR_Picardie	0.644364	0.332997	0.3113667	0.9773604
FR23	FR_Haute-Normandie	0.302352	0.306406	-0.004054	0.6087576
FR24	FR_Centre	0.78493	0.29908	0.4858492	1.08401
FR25	FR_Basse-Normandie	0.675329	0.297824	0.3775054	0.9731534
FR26	FR_Bourgogne	0.658247	0.252689	0.405558	0.9109353
FR30	FR_Nord-Pas-de-Calais	0.716626	0.377446	0.3391806	1.094072
FR41	FR_Lorraine	0.42083	0.327582	0.0932472	0.7484118
FR42	FR_Alsace	0.648288	0.337382	0.3109058	0.9856696
FR43	FR_Franche-Comté	0.667755	0.366942	0.3008132	1.034697
FR51	FR_Pays de la Loire	0.532067	0.366698	0.1653692	0.8987653
FR52	FR_Bretagne	1.20801	0.339386	0.8686273	1.547399
FR53	FR_Poitou-Charentes	0.937234	0.345534	0.5917001	1.282768
FR61	FR_Aquitaine	0.987978	0.30657	0.6814072	1.294548
FR62	FR_Midi-Pyrénées	0.569131	0.276197	0.2929332	0.845328
FR63	FR_Limousin	0.896629	0.265082	0.631547	1.161711
FR71	FR_Rhone-Alpes	0.968226	0.288534	0.6796925	1.25676
FR72	FR_Auvergne	0.735153	0.345592	0.3895617	1.080745
FR81	FR_Languedoc-Roussillon	0.709065	0.274919	0.4341463	0.9839847
FR82	FR_Provence-Alpes-Cote d'Azur	0.392791	0.26841	0.1243811	0.6612011
FR83	FR_Corse	0.302125	0.348368	-0.0462427	0.6504931
FR91	FR_Guadeloupe	-0.405432	0.444371	-0.8498033	0.0389395
FR92	FR_Martinique	-0.258243	0.409765	-0.6680079	0.1515225
FR93	FR_Guyane	-0.367666	0.36722	-0.7348862	-0.0004456
FR94	FR_Réunion	0.017779	0.505115	-0.4873356	0.5228938
GR1	GR_Voreia Ellada	-1.29738	0.46692	-1.764303	-0.8304621
GR2	GR_Kentriki Ellada	-0.982346	0.558249	-1.540594	-0.4240971
GR3	GR_Attica	-0.186338	0.540012	-0.7263497	0.3536738
GR4	GR_Nisia Aigaiou. Kriti	-0.827893	0.473517	-1.301409	-0.354376
HU1	HU_Central Hungary	-0.945973	0.381707	-1.32768	-0.5642668
HU2	HU_Transdanubia	-0.257964	0.233217	-0.4911808	-0.0247468
HU3	HU_Great Plain and North	-0.375622	0.227085	-0.6027073	-0.1485364
IRELAND	IE_Ireland	0.887834			
ITC1	IT_Piemonte	-0.368537	0.24482	-0.6133572	-0.1237168
ITC2	IT_Valle d'Aosta	0.432878	0.246151	0.1867269	0.6790292
ITC3	IT_Liguria	-0.751306	0.320646	-1.071952	-0.43066
ITC4	IT_Lombardia	-0.880229	0.2162	-1.096429	-0.6640291
ITD1	IT_Trentino-Alto Adige(Bolzano)	0.566949	0.231172	0.3357767	0.7981205
ITD2	IT_Trentino-Alto Adige(Trento)	0.277559	0.271582	0.0059767	0.5491409

ITD3	IT_Veneto	-0.70753	0.257858	-0.9653881	-0.4496719
ITD4	IT_Friuli-Venezia Giulia	-0.056537	0.207372	-0.2639094	0.1508352
ITD5	IT_Emil-Romagna	-0.588653	0.187148	-0.7758017	-0.4015051
ITE1	IT_Toscana	-0.794426	0.244314	-1.03874	-0.5501121
ITE2	IT_Umbria	-0.43929	0.301075	-0.740365	-0.1382146
ITE3	IT_Marche	-0.705806	0.295703	-1.001509	-0.4101025
ITE4	IT_Lazio	-1.5	0.261525	-1.761527	-1.238477
ITF1	IT_Abruzzo	-1.147	0.341497	-1.4885	-0.8055063
ITF2	IT_Molise	-1.46933	0.355858	-1.825192	-1.113477
ITF3	IT_Campania	-2.53499	0.302063	-2.837054	-2.232928
ITF4	IT_Puglia	-1.96074	0.326568	-2.287313	-1.634176
ITF5	IT_Basilicata	-1.49184	0.310627	-1.802464	-1.181209
ITF6	IT_Calabria	-2.40746	0.455613	-2.863074	-1.951847
ITG1	IT_Sicilia	-2.05231	0.332418	-2.384724	-1.719888
ITG2	IT_Sardegna	-1.12578	0.287538	-1.413323	-0.8382466
LATVIA	LV_Latvia	-0.798874			
LITHUANIA	LT_Lithuania	-0.866395			
LUXEMBOURG	LU_Luxembourg	1.12326			
MALTA	MT_Malta	0.333871			
NL1	NL_Northern Netherlands	1.5898	0.398223	1.191576	1.988022
NL2	NL_Eastern Netherlands	1.15034	0.35875	0.7915856	1.509085
NL3	NL_Western Netherlands	1.24352	0.330826	0.9126915	1.574342
NL4	NL_Southern Netherlands	1.05038	0.308493	0.7418913	1.358877
PL11	PL_Lodzkie	-0.842786	0.238326	-1.081112	-0.6044596
PL12	PL_Mazowieckie	-0.990314	0.209256	-1.19957	-0.781058
PL21	PL_Malopolskie	-0.87108	0.237275	-1.108355	-0.6338055
PL22	PL_Slaskie	-1.10748	0.184302	-1.291777	-0.9231743
PL31	PL_Lubelskie	-0.900114	0.222066	-1.122181	-0.6780483
PL32	PL_Podkarpackie	-0.848802	0.268723	-1.117525	-0.5800796
PL33	PL_Swietokrzyskie	-0.801872	0.230502	-1.032374	-0.5713692
PL34	PL_Podlaskie	-0.956682	0.201208	-1.15789	-0.7554749
PL41	PL_Wielkopolskie	-0.99299	0.199638	-1.192627	-0.7933524
PL42	PL_Zachodniopomorskie	-0.863354	0.206438	-1.069792	-0.6569154
PL43	PL_Lubuskie	-0.924897	0.259652	-1.184549	-0.6652453
PL51	PL_Dolnoslaskie	-1.10854	0.244496	-1.353037	-0.8640453
PL52	PL_Opolskie	-0.610872	0.223744	-0.8346158	-0.3871286
PL61	PL_Kujawsko-Pomorskie	-0.944576	0.166524	-1.1111	-0.7780519
PL62	PL_Warminsko-Mazurskie	-0.667592	0.216398	-0.8839898	-0.4511934
PL63	PL_Pomorskie	-0.854148	0.199281	-1.053429	-0.6548673
PT11	PT_Norte	-0.408724	0.354227	-0.7629511	-0.0544967
PT15	PT_Algarve	0.113063	0.499507	-0.3864439	0.6125702
PT16	PT_Centro	-0.120377	0.351323	-0.4717	0.2309451
PT17	PT_Lisboa	0.046795	0.386778	-0.3399833	0.4335736
PT18	PT_Alentejo	0.634629	0.379736	0.2548935	1.014365
PT20	PT_A?ores	0.411968	0.300869	0.111099	0.7128375
PT30	PT_Madeira	0.183354	0.40156	-0.2182058	0.5849143
RO11	RO_North-West	-1.06156	0.450279	-1.511837	-0.611279
RO12	RO_Centru	-1.50081	0.449526	-1.950336	-1.051284
RO21	RO_North-East	-1.9268	0.549444	-2.476245	-1.377357
RO22	RO_South-East	-1.94746	0.586293	-2.533751	-1.361166
RO31	RO_South-Muntenia	-1.69116	0.484932	-2.176092	-1.206228

RO32	RO_Bucharest-Ilfov	-2.86201	0.691558	-3.553564	-2.170449
RO41	RO_South-West Oltenia	-1.39932	0.551243	-1.950565	-0.8480803
RO42	RO_West	-2.15954	0.54126	-2.700798	-1.618277
SE1	SE_East Sweden	1.42647	0.314589	1.111882	1.74106
SE2	SE_South Sweden	1.5027	0.35416	1.148538	1.856858
SE3	SE_North Sweden	1.31237	0.289996	1.022377	1.60237
SK01	SK_Bratislava Region	-0.567789	0.292796	-0.8605855	-0.2749932
SK02	SK_Western Slovakia	-0.855228	0.29755	-1.152777	-0.557678
SK03	SK_Central Slovakia	-0.759113	0.240277	-0.9993902	-0.5188364
SK04	SK_Eastern Slovakia	-0.762255	0.248696	-1.010951	-0.5135587
SLOVENIA	SI_Slovenia	-0.187761			
UKC	UK_North East. England	0.92786	0.351728	0.5761324	1.279589
UKD	UK_North West. England	1.04718	0.371567	0.675608	1.418742
UKE	UK_Yorkshire and the Humber. Eng.	0.665006	0.314432	0.3505737	0.9794381
UKF	UK_East Midlands. England	1.24916	0.325304	0.9238572	1.574466
UKG	UK_West Midlands. England	0.810369	0.241009	0.56936	1.051378
UKH	UK_East of England	0.774739	0.292132	0.4826076	1.066871
UKI	UK_London. England	0.499582	0.252649	0.2469333	0.7522308
UKJ	UK_South East. England	1.0888	0.343859	0.7449377	1.432656
UKK	UK_South West. England	1.09708	0.348747	0.7483323	1.445826
UKL	UK_Wales	0.816926	0.350293	0.4666334	1.16722
UKM	UK_Scotland	1.2807	0.379889	0.9008119	1.660591
UKN	UK_Northern Ireland	0.94216	0.415778	0.5263812	1.357938