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Quality of Government and the Returns of Investment: Examining the Impact of Cohesion Expenditure in European Regions

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RODRÍGUEZ-POSE A. and GARCILAZO E. Quality of government and the returns of investment: examining the impact of cohesion expenditure in European regions, *Regional Studies*. This paper sets out to examine the relationship between the quality of local and regional governments and regional economic performance, linking government quality to the returns of European Union Structural and Cohesion Funds. Using primary data on government quality collected by the Quality of Government Institute, combined with World Bank Global Governance Indicators data, a two-way fixed effect panel regression model is conducted for a total of 169 European regions during the period 1996–2007. The results of the analysis underline the importance of government quality both as a direct determinant of economic growth as well as a moderator of the efficiency of Structural and Cohesion Funds expenditure. The analysis finds that both European Union investments targeting regions and quality of government simultaneously make a difference for regional economic growth, but that above a threshold of cohesion expenditure – calculated at more than €120 of cohesion expenditure per capita per year – government quality improvements are a far more important and realistic option for regional development than additional public investment. In many of the regions receiving the bulk of Structural Funds, further improvements in economic growth would require massive amounts of additional investment, unless the quality of government is significantly enhanced.

Quality of government Investments Regional development and growth Regions European Union

RODRÍGUEZ-POSE A. and GARCILAZO E. 政府素质与投资报酬：检视欧洲区域凝聚支出的影响，*区域研究*。本文将政府素质与欧盟结构及凝聚基金的报酬进行连结，着手检视地方及区域政府的素质和区域经济表现之间的关联性。本研究主要运用“政府机构素质”组织所搜集的政府素质数据，结合世界银行全球治理指标之数据，为欧盟 1996 年至 2007 年期间的一百六十九个全数区域，进行二元固定效果追踪回归模型。分析结果，凸显出政府治理同时作为经济成长的直接决定因素与结构及凝聚基金支出效率的调节者之重要性。本研究分析发现，针对区域和针对政府素质的欧盟投资，皆对区域经济增长产生影响，但超过凝聚支出的一定门槛时——以超过每年人均一百二十欧元的凝聚支出为计算分野——政府素质的改善，则较增加公共支出而言，是区域发展更为重要且实际的选项。在诸多接受大量结构基金的区域中，除非政府素质显著地改善，否则便需要大量的额外投资来促进经济增长。

政府素质 投资 区域发展与成长 区域 欧盟

RODRÍGUEZ-POSE A. et GARCILAZO E. La qualité des pouvoirs publics et les rendements des investissements: un examen de l'impact des dépenses de cohésion dans les régions européennes, *Regional Studies*. Cet article cherche à examiner le rapport entre la qualité des pouvoirs publics locaux et régionaux et la performance économique régionale, établissant un lien entre les rendements des Fonds structurels et des Fonds de cohésion de l'Union européenne. Employant des données primaires sur la qualité des pouvoirs publics recueillies par le Quality of Government Institute, combinées aux données provenant des World Bank Global Governance Indicators, on construit un modèle de régression bidirectionnel des données de panel à effets fixes auprès de 169 régions européennes pendant la période allant de 1996 jusqu'à 2007. Les résultats de l'analyse soulignent l'importance de la qualité des pouvoirs publics à la fois comme facteur déterminant direct de la croissance économique ainsi qu'un facteur modérateur de l'efficacité des dépenses des Fonds structurels et des Fonds de cohésion. À partir de cette analyse, il est à constater que les investissements de l'Union européenne ciblant simultanément les régions et la qualité des pouvoirs publics influent sur la croissance économique régionale, bien que l'amélioration de la qualité des pouvoirs publics soit une option beaucoup plus importante et réaliste pour le développement régional que ne le sont les investissements publics

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supplémentaires, au-dessus d'un seuil des dépenses de cohésion – ce qui représente plus de €120 par tête de dépenses de cohésion par an. Dans beaucoup des régions bénéficiaires de la part du lion des Fonds structurels, des améliorations complémentaires de la croissance économique nécessiteraient l'injection de fonds supplémentaires considérables, à moins que la qualité des pouvoirs publics ne soit sensiblement accrue.

Qualité des pouvoirs publics Investissements Développement et croissance régionaux Régions Union européenne

RODRÍGUEZ-POSE A. und GARCILAZO E. Regierungsqualität und die Erträge von Investitionen: Untersuchung der Auswirkung von Kohäsionsausgaben in europäischen Regionen, *Regional Studies*. In diesem Beitrag wird die Beziehung zwischen der Qualität von lokalen und regionalen Regierungen und der regionalen Wirtschaftsleistung untersucht, wobei die Regierungsqualität mit den Erträgen aus den Struktur- und Kohäsionsfonds der Europäischen Union verknüpft wird. Anhand der vom Institut für Regierungsqualität erfassten Primärdaten über Regierungsqualität in Kombination mit den Daten der Weltbank über globale Governance-Indikatoren wird ein wechselseitiges Festeffekt-Panelregressionsmodell für insgesamt 169 europäische Regionen im Zeitraum von 1996 bis 2007 erstellt. Die Ergebnisse der Analyse bestätigen die Wichtigkeit der Regierungsqualität sowohl als direkter Determinant des Wirtschaftswachstums als auch als Moderator für die Effizienz der Ausgaben von Struktur- und Kohäsionsfonds. Die Analyse zeigt, dass sich sowohl EU-Investitionen in Regionen als auch die Regierungsqualität gleichzeitig auf das regionale Wirtschaftswachstum auswirken, wobei aber oberhalb eines Schwellenwerts der Kohäsionsausgaben – der auf mehr als 120 € Kohäsionsausgaben pro Kopf und Jahr beziffert wird – die Verbesserungen der Regierungsqualität eine weitaus wichtigere und realistischere Option für die regionale Wirtschaftsentwicklung darstellen als zusätzliche öffentliche Investitionen. In zahlreichen Regionen, die einen Großteil der Strukturfonds erhalten, wären für weitere Verbesserungen des Wirtschaftswachstums zusätzliche Investitionen in enormer Höhe erforderlich, sofern sich die Regierungsqualität nicht erheblich verbessert.

Regierungsqualität Investitionen Regionalentwicklung und -wachstum Regionen Europäische Union

RODRÍGUEZ-POSE A. y GARCILAZO E. Calidad del Gobierno y el beneficio de la inversión: análisis del efecto del gasto de cohesión en las regiones europeas, *Regional Studies*. En este artículo se estudia la relación entre la calidad de los Gobiernos locales y regionales y el crecimiento económico, vinculando la calidad del Gobierno al impacto de los fondos europeos estructurales y de cohesión. Utilizamos datos primarios de calidad de Gobierno recogidos por el Instituto de Calidad de Gobierno y combinados con datos de los Indicadores de Gobernanza Global del Banco Mundial en un modelo de regresión bivariado de datos de panel con efectos fijos para un total de 169 regiones europeas durante el periodo comprendido entre 1996 y 2007. Los resultados del análisis subrayan la importancia de la calidad de Gobierno como factor directo del crecimiento económico y como factor moderador de la eficacia del gasto en fondos estructurales y de cohesión. Nuestro análisis pone de manifiesto que tanto el gasto en desarrollo regional de la Unión Europea (EU), como la calidad de Gobierno influyen en el crecimiento económico de manera simultánea, pero que por encima de un cierto umbral – calculado en más de 120 euros de gasto en cohesión por persona y año – las mejoras en calidad de Gobierno son una opción más importante y realista para generar desarrollo regional que las inversiones públicas adicionales. En muchas de las regiones que reciben la mayoría de los fondos estructurales, ulteriores mejoras en crecimiento requerirían un aumento masivo de la inversión, a no ser que se mejore de manera significativa la calidad de Gobierno.

Calidad de Gobierno Inversión Desarrollo y crecimiento regionales Regiones Unión Europea

JEL classifications: O17, O43, R11, R58

INTRODUCTION

There has been much debate in policy and scholarly circles investigating whether the quality of institutions, in general, and the quality of government, in particular, affect the delivery and efficiency of public investment. The growing agreement is that institutions and government quality make an important difference for economic development (AMIN, 1999; HALL and JONES, 1999; ACEMOGLU *et al.*, 2001; RODRIK *et al.*, 2004). Places with weak and/or inefficient institutions suffer from a variety of problems, which can range from pervasive corruption, rent-seeking, insider-outsider problems, clientelism and nepotism to principal agent or impacted information problems (RODRÍGUEZ-POSE and STORPER, 2006). Different combinations of these problems lead to imperfectly functioning markets, to a loss of efficiency and growth potential, and to institutional and government failure, affecting, in turn, the

capacity of governments to adequately design and efficiently deliver public goods and policies.

The European Union (EU) has also adopted the view that poor institutions undermine efforts to achieve greater economic and social cohesion. As stated in the EU's Fifth Cohesion Report, 'poor institutions can, in particular, hinder the effectiveness of regional development strategies' (EUROPEAN UNION, 2010, p. 65). The quality of local and regional institutions is thus perceived to mediate the potential returns of investment in regional cohesion: the weaker the institutional setting, the greater the difficulties in transforming European regional development investment into growth and development. Regions with weak institutions have been considered incapable of absorbing regional development and Cohesion Funds and of making the most of the investments taking place in their territory. Many of them have also invested Cohesion and Structural Funds in what can be considered a suboptimal manner. It comes, therefore, as

no surprise that, as early as 1997 in its draft Agenda 2000, the European Commission sought to establish a ceiling of regional development expenditures, stating that in order 'to avoid major problems with regard to absorption, the level of annual aid should increase gradually, subject to the general limit of 4% of national GDP, which would apply to the Structural Funds and the Cohesion Fund together' (EUROPEAN UNION, 1997, p. 25).

Yet, despite the growing interest in institutional factors, the empirical literature on how the quality of government impinges on the potential to achieve European regional cohesion is still in its infancy. While in development economics there has been a growing body of literature linking, for example, the institutions associated with colonial origins and economic outcomes (e.g. ACEMOGLU *et al.*, 2001), there is still relatively little evidence about whether and how government quality has shaped economic trajectories at the regional level in Europe. Early attempts by BEUGELSDIJK and EIJFFINGER (2005) – who introduce in their analysis of the effectiveness of structural policy in the EU a national corruption index – have not been properly followed. Even less is known about the mechanisms at play in the interaction between regional political institutions – beyond social capital (BEUGELSDIJK and VAN SCHAİK, 2005a, 2005b) and culture (e.g. TABELLINI, 2010) – and economic development. At the EU level there is to our knowledge no clear-cut evidence about how the quality of government of the different regions shapes the returns of European cohesion support. There is also little evidence, beyond the work of BECKER *et al.* (2012), that the returns of European cohesion efforts decline as cohesion investment increases and none that they diminish when regional transfers exceed a threshold of 4% of gross domestic product (GDP).

The present paper combines data on the investment undertaken by the EU in cohesion and structural policies targeting regions with data on government quality gathered by the Quality of Government Institute at the University of Gothenburg. This allows the assessment of whether different local combinations taking into account the rule of law, the control of corruption, government effectiveness, and voice and accountability affect regional growth and shape the returns of European Structural and Cohesion Fund investments across the regions of the EU during the period between 1996 and 2007. In particular, of interest is whether and how the quality of government in any given European region moderates the returns of European investments and whether these effects are larger or smaller beyond a given threshold of cohesion investment.

The results indicate that although at first sight the quality of government does not seem to affect the returns of European investment across the whole sample of regions considered, it does play a major role in determining whether European peripheral regions catch up to European standards. For those regions receiving the greatest amount of support – on average more

than €80 of cohesion expenditure per capita per year – government quality tends to be on the whole a more important determinant for growth than European regional support. The relevance of government quality increases significantly as the level of cohesion expenditure rises. In addition, the analysis using interaction terms finds that for regions receiving a considerable amount of funds and sharing a similar level of quality of government, greater cohesion expenditure has a marginal effect on economic growth. And while greater aggregate growth can be achieved by significantly increasing the cohesion budget, improving government quality is a far more realistic alternative.

INSTITUTIONS, QUALITY OF GOVERNMENT AND ECONOMIC DEVELOPMENT

Across all areas of the social sciences there is a growing scholarly consensus that institutions matter for economic development. Economic sociologists (TÖNNIES/LOOMIS, 1887/1957; WEBER/ROTH and WITTICH, 1921/1968; GRANOVETTER, 1973; COLEMAN, 1988) have for over a century stressed the importance of institutions for the effectiveness of public policy and economic development. Different types of institutions not only create the rules of the game by which economic activities are governed, but also *de facto* shape the incentives and disincentives driving economic interactions, making them essential determinants for the economic outcomes in any given territory. The baton laid by economic sociologists has been taken over in recent decades by a raft of other social scientists. Geographers (AMIN and THRIFT, 1994; AMIN, 1999), political scientists (PUTNAM, 1993, 2000) and economists (NORTH, 1990; ACEMOGLU *et al.*, 2001; RODRIK *et al.*, 2004) have of late delved into how institutions influence economic development, indicating that long-term economic outcomes are frequently the result of institutional conditions more than of alternative economic factors (RODRIK *et al.*, 2004).

One essential form of political institution is that related to the quality of government. Government, in general, and local and regional governments, in particular, are the key organizations determining the rules of the game at the local level. The quality of local governments will therefore influence economic development and help shape the efficiency and the returns of public investments. Accountable and transparent governments, staffed by well-trained civil servants and led by trustworthy politicians who have the interests of the local community at heart, will, in all likelihood, design and implement policies and deliver public goods and services needed by its citizenry, benefitting the community as a whole. Unaccountable and poorly staffed governments and governments with inept and/or corrupt politicians at the helm will, by contrast, deliver inefficient policies or, worse still, lead to situations where rent-seeking and insider-outsider problems are pervasive.

The views that institutions matter for economic growth and that the quality of local governments affects the effectiveness and returns of public policies has been accepted at face value by the EU in the application of its regional cohesion policy. This is important because, although all member states of the EU should have adopted the so-called *Acquis Communautaire*,¹ or the accumulated legislation and court decisions of the EU, it is plainly evident that the functioning of these formal institutions varies considerably from country to country and even within countries. This is because, as underlined by VACHUDOVA (2009), especially in the case of former transition countries that have joined the EU since 2004, the requirements to improve the transparency and efficiency of state institutions have been adopted, rather than enforced. This leads to still considerable differences across the EU in the quality of formal institutions and, in particular, in informal institutions. Corruption and clientelism still represent major obstacles for an effective functioning of the rule of law in many areas of the former transition countries of Central and Eastern Europe (GUASTI and DOBOVSEK, 2011; RODRÍGUEZ-POSE and MASLAUSKAITE, 2012). Hence, across parts of Europe there are different combinations of corruption, pervasive rent-seeking, self-serving decision-makers, and a low quality of bureaucracy – all indicators of the presence of weak governmental institutions and a low quality of government – likely to hurt the effectiveness of all types of public policies and, in the case of the EU cohesion effort, undermine the assimilation of funds and affect the potential returns of EU expenditure in Structural and Cohesion Funds. Furthermore, the quality of government at the local level is key for coordinating actions across tiers of government, aligning policy objectives, enhancing the delivery of goods and services, and ensuring that local needs are represented and taken into account in the policy design across the different government layers.

From this perspective, the lower the quality of government, the lower the capacity to absorb development funds, the lower the efficiency and returns of public investments, and the lower the growth.² This sort of reasoning is at the heart of the 4% of GDP expenditure limit proposed in the Agenda 2000: if institutions and the quality of government of any given European region are deficient, more expenditure on development would, at best, only have a marginal impact on economic growth, unless the institutional conditions that limit the effectiveness of expenditure are improved.

MEASURING THE QUALITY OF GOVERNMENT

Linking government quality to regional economic growth is difficult and there is little empirical evidence so far that establishes such a nexus. Perhaps the main problem in this respect is that of defining and measuring the quality of government. Government quality is an

elusive concept. It may mean different things to different people and it is likely to be affected by a myriad of factors. Notwithstanding this, the number of studies and indices that have looked at issues of quality of government and governance at national level has not ceased to grow (e.g. KAUFMAN *et al.*, 2009). However, sub-national regions, cities and localities remain – despite the widespread perception of wide internal variations in government quality within countries – virtually uncharted territories. Some studies have ventured more in depth into how the quality of governmental institutions affects economic performance in different parts of the country. This type of analysis has been prevalent for the case of Italy, where a large number of local *Meridionalisti* (e.g. TRIGILIA, 1992; DIAMANTI *et al.*, 1995; BODO and VIESTI, 1997) and many foreign scholars (e.g. PUTNAM, 1993) have delved for the roots of the differences in development between the North and the South of the country in the variation of the efficiency of local governments. But analyses covering sub-national entities beyond the borders of the nation-state are conspicuously absent.

This lack of comparable cross-European data on government quality across national borders for Europe has recently been addressed in a report by the Quality of Government Institute of the University of Gothenburg (CHARRON *et al.*, 2010). This study resorts to survey data of 34 000 respondents, living in 172 NUTS-1 and NUTS-2 regions (NUTS-2 is largely equivalent to the Organisation for Economic Co-operation and Development's (OECD) Territorial Level 2)³ in 18 EU states⁴ in order to measure the perception of the quality of regional and local governments across Europe. In the report, following ROTHSTEIN and TEORELL (2008), government quality is assimilated to the concept of impartial government institutions, that is 'when public officials who implement policies do not take anything about the citizen/case into consideration that is not beforehand stipulated in the policy or the law' (CHARRON *et al.*, 2010, p. 9). In order to operationalize this concept, the Quality of Government Institute resorts to decomposing the idea of government quality into four components: (1) rule of law; (2) corruption; (3) quality of the bureaucracy or bureaucratic effectiveness; and (4) democracy and the strength of electoral institutions (p. 21).

Thirty-four questions regarding these four components were included in a survey which – after the thematic and geographical aggregation of the different answers by the 34 000 respondents – resulted in the formation of a regional-level quality of government index and to the first mapping of regional government quality across regions of the EU in 2009.

The data provided by the Quality of Government Institute are only available for a single year (CHARRON *et al.*, 2010).⁵ Following CHARRON *et al.* (2014), values are interpolated across a longer time period by combining the data with the World Bank's World Governance Indicators, available at the national

level. The interpolated data provide a time series for the analysis. The assumption is that regional variations in government quality within countries are relatively stable; and variations at the national level are captured by the World Bank World Governance Indicators. Details on how this indicator is calculated can be found in CHARRON *et al.* (2014).

The combined interpolated data for 2009 are presented in Fig. 1. It displays a picture of quality of government in Europe that is strongly associated with the levels of socio-economic development and social trust of the regions of the EU, but uncorrelated to other factors, such as population and area size (CHARRON *et al.*, 2014). It reveals the presence of a West/East and, to a much lesser extent, North/South divide in the sub-national quality of government in Europe. Regions in Denmark, Finland, Sweden and the Netherlands rank among those with the best government quality in Europe, as is the case of Scotland in the UK, Schleswig-Holstein and Thuringia in Germany, and Burgenland in Austria. Among the regions in the South, Alto Adige in Italy is also amongst the best performers. Some Spanish regions, such as Aragon, Asturias, the Basque Country, Extremadura or Galicia, also score relatively highly in the index. Friuli-Venezia Giulia, Trentino and Val d'Aosta in Italy also perform well. The worst scores are found in the South East of Europe. Bulgarian and Romanian regions have, according to the results of the survey, the worst quality of government. Some southern Italian regions, such as Calabria, Campania, Puglia and Sicily, are also in the same category (Fig. 1).

Internal contrasts are visible in a number of countries. This is more evident in countries with an overall low sub-national quality of government (Slovakia being the main exception). Italy represents the most extreme case. While some northern regions have levels of government quality similar to those of Scandinavian countries or the Netherlands, there is very little difference in the perception of the quality of government between regions in the South of the country and those of Bulgaria or Romania. In Romania some regions in the west of the country – Nord Vest and Centru – perform relatively well, whereas Bucharest ranks well below the national mean. Strong internal variation can also be observed in Belgium, Bulgaria, Portugal or Spain. In sum, the strong internal country variation observed in Fig. 1 confirms the relevance of the quality of local and regional institutions.

MODEL AND DATA

Model specification

In light of the theoretical discussion, the hypotheses are that (1) 'good governance is a necessary requirement for countries to foster economic development' (CHARRON *et al.*, 2010, p. 19) and that (2) government quality shapes the capacity to transform investment into economic

activity and development. In order to check whether this is the case, an econometric model is estimated using panel data, which aims to assess the connection between government quality and regional growth and to establish whether the returns of European economic and social cohesion expenditure are affected by the quality of the government of the regions receiving funds. Also controlled are a series of regional factors deemed to affect economic performance. In this interactive model, the growth of GDP per capita across regions in Europe between 1996 and 2007 is specified by the following equation:

$$\Delta y_i = \alpha + \beta y_i + \delta \text{Cohesion}_i + \phi \text{QGov}_i + \gamma \text{Cohesion}^* \text{QGov}_i + \phi \mathbf{X}_i + v_i \quad (1)$$

where Δy is the average annual growth of real GDP per capita of region i over the period 1996–2007; y_i is the GDP per capita in the previous period in region i ; *Cohesion* is the main independent variable of interest and represents the per capita investments undertaken by the EU in region i under the structural and cohesion policy framework; *QGov* is the moderator, proxied by the composite indicator of the quality of government in any given European region, collected by the Quality of Government Institute at the University of Gothenburg; *Cohesion*QGov* is the interaction term between the previous two variables; \mathbf{X} denotes a vector of variables controlling for other factors assumed to influence growth, including the level of education and training of the adult population of the region, measures of infrastructure endowment, levels of employment and agglomeration effects; and finally v is the corresponding disturbance term.

The main interest lies in the coefficients δ , ϕ and γ , which intend to capture the connection between the level of investments of the EU on regional cohesion, the quality of regional and local governments, and the interaction of both terms, respectively, with economic growth.

By expanding model (1), the following specification is obtained, which is used as the empirical model:

$$\begin{aligned} \ln\left(\frac{\text{GDPpc}_{i,t}}{\text{GDPpc}_{i,t-1}}\right) = & \alpha + \beta_1 \ln(\text{GDPpc}_{i,t-1}) \\ & + \beta_2 (\text{CohesionExp}_{i,t-1}) \\ & + \beta_3 (\text{QualGov}_{i,t-1}) \\ & + \beta_4 (\text{CohesionExp}^* \text{QualGov}_{i,t-1}) \\ & + \beta_5 \ln(\text{InfrastDen}_{i,t-1}) \\ & + \beta_6 \ln(\text{Primary Education}_{i,t-1}) \\ & + \beta_7 \ln(\text{Tertiary Education}_{i,t-1}) \\ & + \beta_8 (\text{Emp Rate}_{i,t-1}) \\ & + \beta_9 \ln(\text{Emp Density}) \\ & + \beta_{10} \ln(\text{Pop Density}) + \gamma_j C_j \\ & + \varphi_i T_i + u_i + e_{i,t} \end{aligned} \quad (2)$$

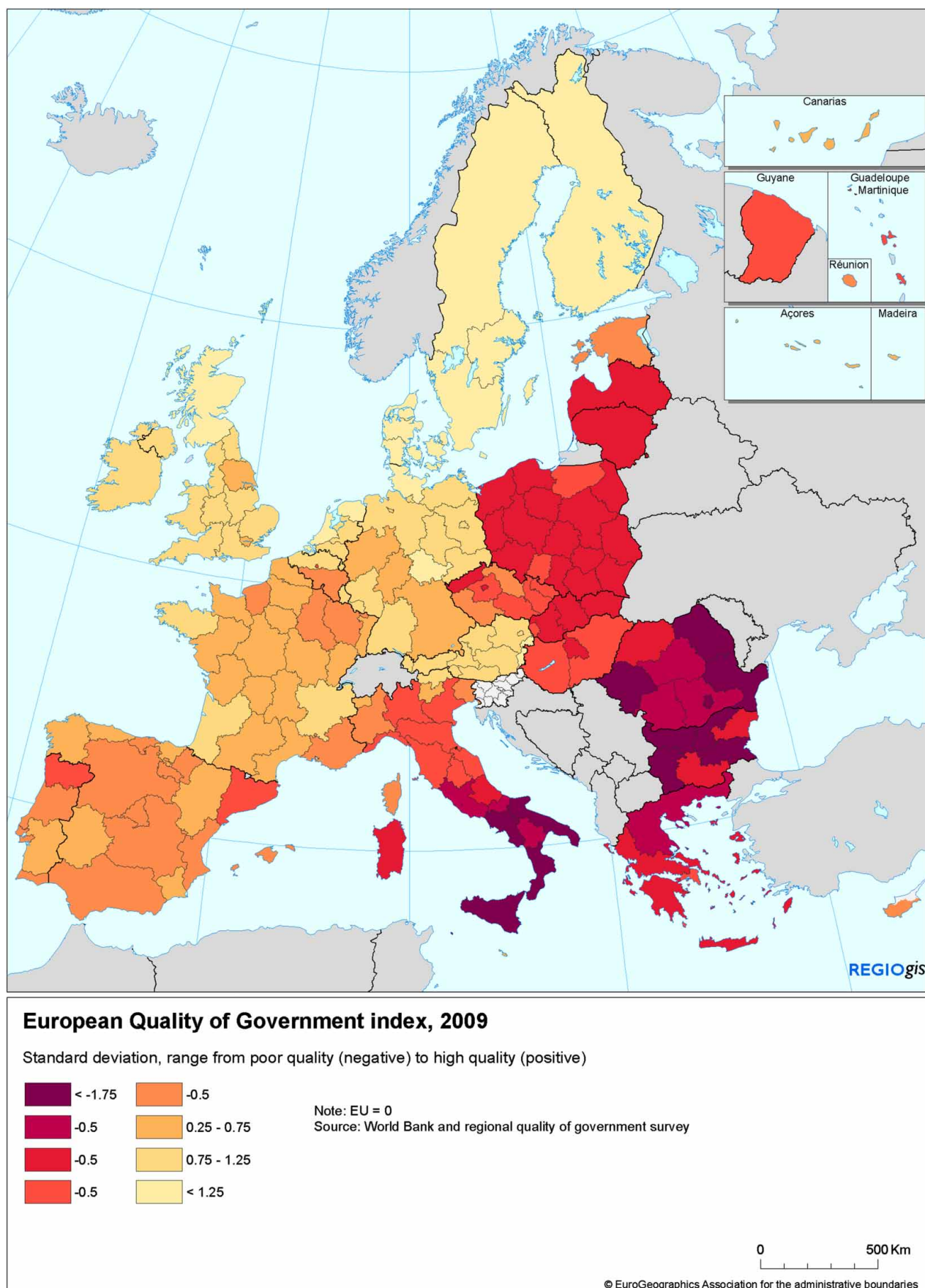


Fig. 1. Regional quality of government combined index, 2009

Data

The main independent variable of interest, the public investments financed by the EU (*CohesionExp*), is measured over the period between 1996 and 2007. It depicts the actual payments in a given year – rather than commitments, as in a number of prior studies on the impact of Structural and Cohesion Funds – to European regions. Unfortunately, these data do not cover public investments financed by regions and by national governments. Such data exist only for a very limited number of countries. The variable thus represents a fraction of all public investment, and a highly variable fraction at that, as there are large differences in the degree to which regions draw on EU financing. These differences are explicitly addressed in some of the models below.

The quality of institutions is proxied by the use of a quality of government (*QualGov*) composite index. As indicated above, this index is constructed for 172 European regions from a survey conducted in 2009 by the Quality of Government Institute at the University of Gothenburg (see CHARRON *et al.*, 2010, for full details).

In order to transform *QualGov* into a time-variant variable, the data on government quality derived from the survey are combined with the World Bank's Global Governance Indicators. This is possible because the components included in the World Bank indicators – (1) rule of law, (2) governance effectiveness, (3) control of corruption and (4) voice and accountability – mirror those of the Quality of Government index. It is therefore assumed that the quality of government detected in every region in 2009 has evolved in a similar way as changes in governance at the national level over time (CHARRON *et al.*, 2014). Mixing both indices gives a regional indicator of quality of government that varies for the whole period of analysis.

The third key independent variable of interest is the interaction term for public investment and the quality of government (*CohesionExp*QualGov*). The introduction of this interaction represents an effort to discern to what extent, if any, the impact of public investments depends on quality of government.

In addition, a number of control variables that, according to the theoretical and empirical literature, may affect regional economic performance in Europe are also considered. Data for the control variables are taken from the OECD Regional Database. The key control variables are:

- *InfrasDen*: infrastructure density defined by motorway kilometres by population.
- *Education*: the percentage of adults having either only completed primary school (*Primary Education*) or with a university degree (*Tertiary Education*) represents the proxies of the level of human capital of the workforce.
- *Emp Rate*: rate of employment in the region.
- *Density*: employment density (*Emp Density*) and population density (*Pop Density*) capture

agglomeration effects and are measured as employment per square kilometre and population per square kilometre, respectively.

- *GDP_{t-1}*: level of GDP per capita at time $t - 1$.

The model specification considers a two-way fixed effect (FE) panel regression model, with heteroskedasticity robust estimators and country (C) and time (T) controls. The sample of regions totals 169 (three regions had to be dropped from the analysis because of gaps in the data) in 18 different countries in the EU. Most data are gathered – following the territorial division used in order to compile the Quality of Government indicator – at NUTS-2 level, with the exception of data for Belgium, Germany, Greece, the Netherlands and the UK, which refer to NUTS-1 regions. The time period covered in the analysis is limited to the years between 1996 and 2007 due to the lack of availability of World Bank Global Governance Indicators before 1996.

RESULTS OF THE ANALYSIS

Analysis for the whole sample

The empirical model is estimated including all regions considered in the analysis, regardless of the level of cohesion expenditure in each of the regions by the EU. The aim of this model is first to establish the link between investments in EU cohesion policy (Table 1, regression 1), on the one hand, and quality of government (Table 1, regression 2), on the other, with economic growth; second, to establish the same link accounting for both factors together (Table 1, regression 3); and, finally, to establish the link accounting for both main components with their interaction (Table 1, regression 4).

The analysis provides evidence that EU-financed public investment has had a positive and statistically significant link with regional growth, independently of the quality of local and regional government (Table 1, regressions 1, 3 and 4). The coefficient for the average expenditure per head per region in Cohesion Funds is always positive and significant, whereas that referring to the quality of government remains statistically insignificant (with the exception of regression 3), despite having a positive sign. The interaction between cohesion investments by the EU and the quality of government is also insignificant (Table 1, regression 4), pointing to the possibility that the investment efforts by the EU may work regardless of the quality of the government of the region where the expenditure takes place.

The relationship between the control variables and regional economic growth is generally as expected. The presence of low-skilled workers – proxied by the percentage of the adult population with low levels of educational attainment – influences growth negatively and infrastructure endowment has a positive impact. The

Table 1. Impact of public investment and quality of government on regional growth

Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)
GDP pc growth	Two-way FE	Two-way FE	Two-way FE	Two-way FE	GMM-sys 4–7 lags	GMM-sys 4–5 lags
ln GDPpc	0.00119 (0.00848)	0.00693 (0.00976)	0.000756 (0.00878)	0.000780 (0.00877)	−0.0332*** (0.00892)	−0.0328*** (0.00931)
Cohesion expenditure pc	3.16e−05** (1.15e−05)		3.05e−05** (1.20e−05)	3.10e−05** (1.24e−05)	4.44e−05** (1.84e−05)	5.25e−05*** (2.03e−05)
Quality of government		0.00384 (0.00277)	0.00380* (0.00217)	0.00392 (0.00243)	0.00137 (0.00510)	0.00178 (0.00513)
$CohesionExp \times QualityGov$				−9.94e−07 (1.04e−05)	1.07e−05 (1.85e−05)	1.29e−05 (2.11e−05)
Primary education	−0.0847* (0.0411)	−0.0670** (0.0281)	−0.0804** (0.0379)	−0.0807** (0.0373)	−0.0325** (0.0162)	−0.0345** (0.0172)
University education	−0.0125 (0.0503)	−0.0201 (0.0453)	−0.00525 (0.0487)	−0.00543 (0.0483)		
ln Transport density	0.00275** (0.00124)	0.00238** (0.00110)	0.00253** (0.00116)	0.00253** (0.00115)		
Employment rate	0.000610 (0.000751)	−0.00142 (0.00156)	0.000752 (0.000697)	0.000746 (0.000758)	0.000550* (0.000298)	0.000495* (0.000297)
ln Employment density	−0.0544 (0.0446)	0.0314 (0.0841)	−0.0702 (0.0405)	−0.0699 (0.0435)		
ln Population density	0.0566 (0.0448)	−0.0309 (0.0848)	0.0726* (0.0407)	0.0723 (0.0438)	0.00354 (0.00241)	0.00485** (0.00234)
ln National growth					−0.0567** (0.0254)	−0.0550* (0.0284)
Constant	−0.0303 (0.115)	0.109 (0.139)	−0.0559 (0.109)	−0.0553 (0.113)	0.345*** (0.0853)	0.338*** (0.0888)
Time controls	Yes	Yes	Yes	Yes	Yes	Yes
Country controls	Yes	Yes	Yes	Yes		
Number of observations	972	1017	972	972	1125	1125
R^2	0.261	0.238	0.264	0.264		
Number of countries	18	18	18	18	18	18
p-value of Hansen test					0.353	0.006
Number of instruments					173	124

Notes: No threshold. Robust standard errors are given in parentheses.

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

stock of the total population with a university education, employment rates and employment density are insignificant across all specifications of the model. Population density is only positive and significant in regression 3.

One potential caveat is that the results presented in Table 1 (regressions 1–4) may be affected by endogeneity. Endogeneity worries fundamentally concern the Structural Funds expenditure variable. To assess whether this is a factor in the results, the model is re-estimated using a dynamic panel analysis (generalized method of moments – GMM) (Table 1, regressions 5 and 6). GMM-system is used as it accounts better than GMM-difference for the high degree of persistence in the variables (ROODMAN, 2009a).⁶ The number of time lags used as instruments is four to seven (Table 1, regression 5) and four to five (Table 1, regression 6).

The estimation of the dynamic panel analysis broadly confirms the results of the two-way fixed effect panel regression model. Expenditure in Structural Funds remains significant and positive and seems to be a more important factor determining regional economic growth than quality of government, which displays an insignificant coefficient. The interaction between both variables remains insignificant (Table 1, regressions 5 and 6).

Analysis including different cohesion expenditure thresholds

However, the results presented in Table 1 may be somewhat misleading, as the sample includes all regions in the EU and is not particularly focused on those regions that receive the bulk of the cohesion effort. Hence, the presence of a large number of regions that are relatively well-off, where EU intervention in order to achieve

greater cohesion is very limited, and where the overwhelming majority of public expenditure is bound to come from local, regional and national sources, rather than from the EU, may bias the results. EU Structural Fund and cohesion intervention in most of these regions would be insufficient to make any real difference in economic performance.

As can be seen in Fig. 2, EU-financed public investment varies widely across regions and this variation is decidedly non-linear. Over the whole period of analysis, the average expenditure by the EU on Structural and Cohesion Funds was €83.23 per head per region.⁷ However, the great majority of European regions are located on the left-hand side of the distribution – and well below the mean – and receive funds that normally range between €0 and €60 per inhabitant per year. By contrast, a much smaller number of regions (represented by the long tail to the right of the expenditure axis) are allocated the bulk of cohesion resources, following the principle of concentration of funds in those regions with the greatest need. These regions include the so-called ‘less developed’ regions – formerly known as ‘Objective 1’ regions – which, by definition, are considerably poorer and, in general, also tend to have greater government quality problems. These regions are, moreover, concentrated in specific parts of Europe – mainly in Central and Eastern and Southern Europe – which, as seen in Fig. 1, are precisely those with the lowest levels of quality of government. Consequently, there is some reason to believe that there may be a good deal of co-variation in the expenditure and government quality variables – that is, highly supported regions tend to be more prevalent in countries where the quality of government scores are lower.

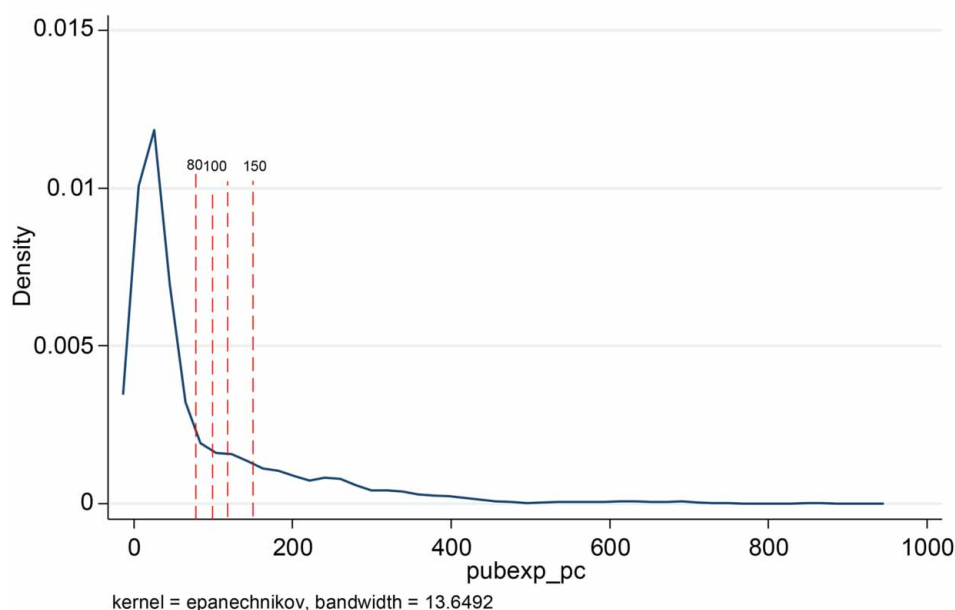


Fig. 2. Distribution of European Union funds per capita (kernel density estimate)

Given the very unequal distribution of Cohesion Funds across the regions of the EU, it is assumed that quality of government may only make a real difference for regional economic growth in those regions that received a considerable amount of funding per head per year. Therefore, the sample is divided following a series of thresholds according to the amount of money received by each region in any given year. These thresholds are established at €80, €100, €120 and €150 of regional expenditure per capita,⁸ allowing one to discriminate between the effects of public investment and quality of government on regional performance in regions benefiting from different levels of public intervention. The threshold of a minimum of €100 of Structural and Cohesion Fund expenditure per capita is taken as the benchmark model for those regions receiving the bulk of the funds (Table 2), and whether the coefficients of Structural Fund expenditure and government quality, as well as their interaction, change as the level of transfers per head increases is examined (Table 3).

The results for those regions receiving a substantial amount of Structural and Cohesion Fund expenditure per capita (Table 2) differ considerably from those for the whole sample (Table 1). Although the coefficients for the control variables are, with exception of the initial GDP per capita of the region and some of the coefficients for employment and population density, virtually unchanged, the results for cohesion expenditure per capita, quality of government and their interaction tell a very different story:

- In regions where, given the level of expenditure, Structural and Cohesion Fund investments may make a real difference, the quality of government

trumps cohesion expenditure as the main variable of interest determining economic growth.

- For those regions receiving the bulk of the European cohesion effort (Table 2, regressions 2–4), the quality of the local or the regional government is an essential factor influencing economic performance.
- When cohesion expenditure, government quality and their interaction are considered together (Table 2, regression 4), the coefficients of all three variables are significant, although quality of government remains by far the most significant of the three. Cohesion expenditure has a small, positive and significant coefficient, whereas the interaction between cohesion expenditure and quality of government points in the direction of a very marginal reduction of the effect of quality of government as cohesion expenditure increases.
- As the coefficient for the interaction is negative, the positive effect of quality of government becomes smaller as the level of expenditure increases (or vice versa, expenditure has a positive effect, but that effect becomes smaller as quality of government increases). According to the coefficients of Table 2 (regression 4), this would happen when cohesion expenditure in a year exceeds €550 per capita per year, close to seven times the average expenditure per region.

In order to check whether these results are robust, Table 3 considers different expenditure thresholds for Structural and Cohesion Funds (no threshold, €80, €100, €120 and €150 per capita per annum in any given region). It is worth noting that as the threshold of structural and cohesion investments per capita per annum increases, the number of observations and the number

Table 2. *Impact of public investment and quality of government on regional growth*

Dependent variable	(1)	(2)	(3)	(4)
GDP pc growth	Two-way FE	Two-way FE	Two-way FE	Two-way FE
ln GDPpc	−0.0494** (0.0207)	−0.0116 (0.0157)	−0.0603** (0.0202)	−0.0621** (0.0197)
Cohesion expenditure pc	2.12e−05 (1.69e−05)		1.41e−06 (1.56e−05)	1.72e−05** (6.58e−06)
Quality of government		0.0136** (0.00514)	0.0125*** (0.00336)	0.0225*** (0.00633)
<i>CohesionExp</i> × <i>QualityGov</i>				−4.39e−05** (1.50e−05)
Primary education	−0.328*** (0.0898)	−0.105* (0.0538)	−0.281*** (0.0607)	−0.286*** (0.0615)
University education	−0.189 (0.114)	0.0587 (0.0593)	−0.121 (0.0769)	−0.129 (0.0777)
ln Transport density	0.0124** (0.00474)	0.00398 (0.00365)	0.0111** (0.00401)	0.0119** (0.00379)
Employment rate	0.000967 (0.00138)	0.000570 (0.00155)	0.000933 (0.00117)	0.000987 (0.00124)
ln Employment density	−0.104 (0.0805)	−0.114 (0.0776)	−0.120* (0.0566)	−0.135** (0.0533)
ln Population density	0.111 (0.0825)	0.120 (0.0776)	0.128* (0.0574)	0.144** (0.0538)
Constant	0.546** (0.235)	0.00242 (0.200)	0.596** (0.215)	0.595** (0.224)
Time controls	Yes	Yes	Yes	Yes
Country controls	Yes	Yes	Yes	Yes
Number of observations	218	263	218	218
R ²	0.336	0.379	0.355	0.362
Number of countries	10	14	10	10

Notes: Threshold €100. Robust standard errors are given in parentheses.

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

Table 3. Impact of public investment and quality of government on regional growth

Dependent variable	(1) No threshold	(2) > €80	(3) > €100	(4) > €120	(5) > €150
GDP pc growth					
ln GDPpc	0.000780 (0.00877)	-0.0472** (0.0182)	-0.0621** (0.0197)	-0.0816*** (0.0240)	-0.0720*** (0.0221)
Cohesion expenditure pc	3.10e-05** (1.24e-05)	1.71e-05*** (5.21e-06)	1.72e-05*** (6.58e-06)	2.54e-05* (1.17e-05)	1.48e-05 (1.65e-05)
Quality of government	0.00392 (0.00243)	0.0186** (0.00611)	0.0225*** (0.00633)	0.0258*** (0.00627)	0.0315*** (0.00721)
CohesionExp × QualityGov	-9.94e-07 (1.04e-05)	-4.07e-05** (1.51e-05)	-4.39e-05** (1.50e-05)	-5.49e-05** (2.01e-05)	-6.83e-05*** (1.94e-05)
Primary education	-0.0807** (0.0373)	-0.273*** (0.0504)	-0.286*** (0.0615)	-0.311*** (0.0491)	-0.280*** (0.0502)
University education	-0.00543 (0.0483)	-0.127 (0.0729)	-0.129 (0.0777)	-0.156** (0.0660)	-0.0967 (0.0674)
ln Transport density	0.00253** (0.00115)	0.00998** (0.00363)	0.0119** (0.00379)	0.0134*** (0.00397)	0.0144*** (0.00332)
Employment rate	0.000746 (0.000758)	0.000532 (0.00149)	0.000987 (0.00124)	0.000774 (0.00101)	-0.000369 (0.00119)
ln Employment density	-0.0699 (0.0435)	-0.112 (0.0677)	-0.135** (0.0533)	-0.113* (0.0517)	-0.0646 (0.0669)
ln Population density	0.0723 (0.0438)	0.119 (0.0688)	0.144** (0.0538)	0.122** (0.0522)	0.0715 (0.0682)
Constant	-0.0553 (0.113)	0.496* (0.223)	0.595** (0.224)	0.842** (0.304)	0.844** (0.319)
Time controls	Yes	Yes	Yes	Yes	Yes
Country controls	Yes	Yes	Yes	Yes	Yes
Number of observations	972	252	218	193	165
R ²	0.264	0.342	0.362	0.350	0.346
Number of countries	18	11	10	10	10

Notes: Different thresholds (two-way fixed effects). Robust standard errors are given in parentheses.
*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

of countries affected declines rapidly. Whereas the whole sample included a total of 972 observations and 18 countries for which a full set of variables are available, when the €80 threshold is applied only 252 observations in 11 countries remain. By the time the €150 threshold is reached, the sample is limited to 165 observations in ten countries.

The use of the different thresholds corroborates the results of the regressions for the more than €100 threshold reported in Table 2:

- Above an expenditure threshold of €80 per head per annum, the coefficient for the cohesion expenditure variable progressively loses significance as the threshold increases.
- The coefficient for cohesion expenditure is last significant at the €120 threshold. For those regions receiving more than €120 per person, additional investments in Structural and Cohesion Funds become totally dissociated from greater economic growth (Table 3, regression 5). These results stand beyond the €150 threshold presented in Table 3.

Hence, the positive and significant association between cohesion expenditure per capita and economic growth reported in Table 1 (and also in Table 3, regression 1) gradually evaporates, leading to a much stronger and significant connection between government quality and regional economic performance. Indeed, at relatively high levels of cohesion expenditure per capita, the quality of local or regional government always dominates the level of expenditure per head as the key predictor of regional economic growth. Beyond €80 of expenditure in regional development per capita per annum, the coefficient for quality of government is always highly positive and significant. And this relationship is reinforced as the threshold of expenditure is increased (Table 3, regressions 2–5). The association between quality of government and regional economic performance is considerably stronger when the threshold of expenditure is above €120 per head per annum in any given region than when the threshold is limited to €80. It is strongest for those regions receiving more than €150 per inhabitant per year and keeps on increasing beyond this threshold.

The introduction of the interaction between public investment and quality of government (Table 3) further reinforces the importance of the quality of government variable in determining regional economic performance. As seen in Table 2 and reproduced in all regressions for Table 3 – with the exception of when the no expenditure threshold is applied (regression 1) – the introduction of the interaction term reinforces the positive and significant coefficients associated to the quality of government variable.

However, the coefficient of the interaction term between cohesion investment and quality of government above the €80 per head investment threshold is

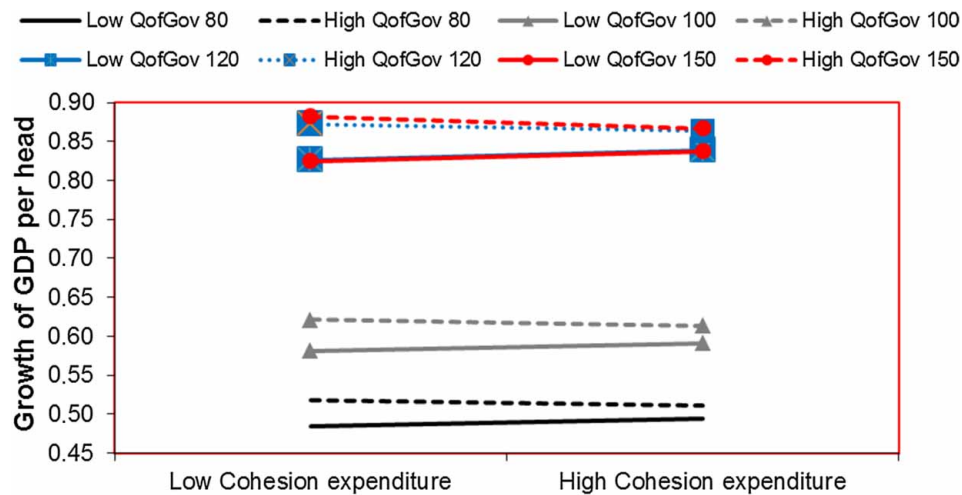


Fig. 3. Two-way interaction effect for quality of government and cohesion expenditure (unstandardized values)

always negative and significant (Table 3, regressions 2–5), at least until a €210 threshold. Nevertheless, ‘the size and precise nature of this effect is not easy to divine from examination of the coefficients alone, and becomes even more so when one or more of the coefficients are negative’ (DAWSON, 2014, p. 3), as is the case in the present analysis.

In order to overcome this problem and fine tune the interpretation of how the link between expenditure in cohesion and structural policies and regional economic performance is mediated by the quality of government of the different regions of the EU, Fig. 3 plots the two-way interaction effects for the unstandardized variables using the procedures of AIKEN and WEST (1991), DAWSON and RICHTER (2006), and DAWSON (2014).⁹ This allows for an easy visual interpretation of the results,

by calculating the predicted values of Y under different conditions (high and low values of the X, and high and low values of the Z) and showing the predicted relationship (‘simple slopes’) between the X and the Y add these different levels of Z.

(DAWSON, 2014, p. 3)

In the case of Fig. 3, X represents cohesion expenditure in any given region in the EU, Y GDP growth per head, and Z quality of government.

The widespread method of setting test values that are 1 SD (standard deviation) above and below the mean is used (AIKEN and WEST, 1991; DAWSON and RICHTER, 2006). A total of 87.3% of the Structural and Cohesion Fund expenditure observations in the sample are included within this range. Also taken into account is the quality of government at the different thresholds of cohesion expenditure considered in the analysis.

Several conclusions can be extracted from Fig. 3. First of all, it is evident that the returns of European investment in regional cohesion increase as the threshold of investment per capita per annum increases. The

returns are higher at a €100 threshold than at an €80 threshold. In turn, regions that receive more than €120 of Structural and Cohesion Fund expenditure per annum do better in growth terms than those getting a minimum of €100. However, the benefits of additional Cohesion Funds stop – in agreement with the results of the regressions in Table 3 – at €120 as there is virtually no difference between the returns experienced by regions receiving more than €120 and those receiving more than €150 (note that the two lines for low quality of government for expenditure thresholds of €120 and €150 overlap). In this respect, the results confirm that poor quality of government may be at the root of what BECKER *et al.* (2012) describe as declining returns of regional development funds in Europe as the transfer intensity increases. These authors, using a radically different method, reach the conclusion that in a considerable number of European regions the transfer intensity of European regional funds exceeds what can be considered the efficiency maximizing level. They even highlight that, in some cases, a reduction of transfers would not affect regional economic performance (BECKER *et al.*, 2012).

Second, in all categories considered and for levels of expenditure ranging between 1 SD above and below the mean, regions with a higher quality of government perform significantly better at the same level of cohesion expenditure than those with a lower quality of government.

Third, although in the observations in the sample considered in Fig. 3 increasing cohesion investment helps reduce the gap in the economic returns experienced by high-quality government and low-quality government regions, this reduction is marginal and does not suffice to overcome the quality of government gap which is the main explanation behind the difference in the returns from cohesion expenditure of regions benefiting from a similar level of European regional cohesion support.

Table 4. Additional impact on regional growth of increasing Structural Fund expenditure and quality of government by 1 SD (standard deviation) in low quality of government regions (results are shown as percentages)

	> €80	> €100	> €120	> €150
Increase in Structural Fund expenditure	1.93	1.68	1.59	1.50
Increase in quality of government	6.94	6.93	5.63	6.89

To give a more precise idea of the dimension by which differences in quality of government trump the potential effects of additional cohesion investment on regional growth for these regions, some calculations based on Fig. 3 were performed.¹⁰ The results indicate that above a certain threshold of cohesion expenditure per capita, investing more in cohesion expenditure has a positive but very limited returns on the growth of GDP per head. At levels of more than €80 in cohesion expenditure per head per annum, increasing the amount of Cohesion Funds by 1 SD in a region with a low quality of government yields an added growth of a mere 1.9% above what would have been achieved had that additional investment not taken place. The positive influence of any further cohesion investment declines as the investment threshold rises: the additional impact on growth is of 1.7% above €100 of expenditure; 1.6% above €120; and 1.5% above €150 (Table 4). By contrast, increasing the quality of government by that same standard deviation would lead to significantly higher increases in growth rates. The additional impact of improving the quality of government hovers just below 7% across all categories, with the exception of the €120 threshold (5.6%) (Table 4). The positive impact of improvements in quality of government is somewhat lower for those regions that benefit from levels of support which are considerably higher than the pre-established threshold. Yet, even in those cases, improving the quality of government would yield greater returns than continuing to increase cohesion expenditure. The additional effect of improving quality of government by 1 SD in these cases ranges between a minimum of 2.9% additional growth (above €120) and a maximum of 3.9% (above €100).

What would happen if, instead of limiting the analysis to the 87.3% of cases comprised in the range between 1 SD above and below the mean, the whole sample were taken into account? As the sign of the interaction term between cohesion investment and quality of government is always negative and significant above the €80 threshold (until the €210 threshold), there is a point where – according to the €100 threshold regression used as the benchmark model (Table 2, regression 4 or Table 3, regression 3) – the growth effect linked to pouring additional funds would offset a potentially negative growth effect of any improvements in quality

of government. As mentioned above, in our benchmark model this would happen only when cohesion expenditure exceeds €550 per capita per year. Beyond this threshold, any additional Structural Fund and Cohesion expenditure would counterbalance any potential drawbacks of having a bad government. However, this applies to a very small minority of cases – only 26 cases out of a total of 1954 years of expenditure considered in the sample (1.33% of all cases) – and fundamentally to two outlier regions: the ultra-peripheral Portuguese regions of the Azores and Madeira. In Madeira, EU expenditure exceeded the €550 threshold in 11 of the 12 years considered. In the Azores, this happened in eight years.¹¹ These two regions are exceptional in many ways. First, because of their island condition and ultra-peripheral status, they have been the recipients of considerably more funds than most other peripheral regions in the EU. Second, they are also the only two regions with a substantial degree of autonomy in a highly centralized country. Third, according to the data used in the analysis, they have a quality of government that is both above the national average for Portugal and that for the whole of the EU. The quality of the government is therefore much better than in other regions of Southern and Eastern Europe which have been traditionally the main recipients of Cohesion Funds. Given the special characteristics of these two regions, it may be plausible that additional funds are a better option than seeking to improve the quality of government.

Yet even in these two cases this conclusion must be treated with caution as these calculations concern only the benchmark regression. As the thresholds increase, the coefficients for cohesion expenditure decline and eventually become irrelevant beyond a €120 cohesion expenditure per capita per annum threshold, making either the coefficient of the interaction irrelevant or, at least, pushing the monetary threshold for the negative interaction effect to kick in at even higher levels, thus virtually excluding all EU regions from this possibility.

In any case, it would take an extraordinary increase in the EU budget to make a policy based on pure expenditure more efficient than one based on improvements in the quality of government of the most peripheral regions as one of its pillars. If all 71 of the regions identified as ‘less developed’ for the 2014–20 programming period were to be funded at this level, it would imply an expenditure of €492.8 billion. This represents multiplying the current allocation – €182.2 billion for 2014–20 – for cohesion and regional development in these regions by 2.7. Improving government quality is a far more cost-efficient and politically palatable option.

Assessing endogeneity

In order to assess whether the perception of the link between Structural Fund expenditure, quality of government and regional growth at different thresholds of

Table 5. Impact of public investment and quality of government on regional growth

Dependent variable	> €80	> €100	> €120	> €150
GDP pc growth	GMM-sys	GMM-sys	GMM-sys	GMM-sys
Cohesion expenditure pc	3.14e-05** (1.54e-05)	3.82e-05* (2.21e-05)	4.06e-05* (2.27e-05)	3.47e-05* (1.94e-05)
Quality of government	0.0151*** (0.00477)	0.0147*** (0.00463)	0.0142*** (0.00471)	0.0114** (0.00451)
<i>CohesionExp</i> × <i>QualityGov</i>	-5.38e-05** (2.44e-05)	-5.23e-05** (2.25e-05)	-5.11e-05** (2.25e-05)	-3.87e-05** (1.95e-05)
ln National Growth	0.352** (0.150)	0.430** (0.171)	0.273 (0.219)	0.309 (0.229)
Constant	0.0299*** (0.00876)	0.0240** (0.0112)	0.0276* (0.0152)	0.0274* (0.0155)
Time controls	Yes	Yes	Yes	Yes
Number of observations	463	410	361	307
Number of countries	11	10	10	10
p-value of AR(4) test	0.189	0.145	0.198	0.231
p-value of Hansen test	0.372	0.427	0.602	0.769
Number of instruments	55	55	55	55

Notes: Different thresholds (GMM-sys). Robust standard errors are given in parentheses.

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

Cohesion Fund expenditure is affected by endogeneity problems, this paper resorts once more to a dynamic panel data analysis (GMM-sys). As seen in Table 3, the introduction of expenditure thresholds leads to a substantial reduction in the number of observations, making it necessary to limit the number of regressors to the three key variables of the model.¹² The results of the GMM-sys analysis are presented in Table 5.

The results indicate that the direction of causality runs from cohesion expenditure and quality of government to regional economic growth, rather than vice versa. They are also broadly in line with the FE estimations presented in Table 3. Above €80 of expenditure per capita per annum in cohesion, quality of government is a more important factor for economic growth than additional cohesion expenditure. The interaction between both factors has a negative coefficient, but the coefficients show that the increase in growth associated with dedicating resources to cohesion in a region with a low quality of government vis-à-vis a region with a better government quality is marginal and incapable of overcoming the differences in economic growth impact of the variation in government quality (Table 5).

CONCLUSIONS

This article has analysed the extent to which regional growth in Europe is affected by European regional development and cohesion investment, on the one hand, and by the quality of the government of the regions receiving the funds, on the other. The capital role played by government quality on economic growth and on the returns of public policy has been strongly posited by the literature dealing with the economic implications of institutions. It has also been indirectly presumed by the EU in its structural and cohesion policy by the mere fact of having discussed a cap on the amount of resources that could be channelled

to specific regions on the basis of their capacity to absorb and adequately use funds. However, to date there has been no empirical demonstration that quality of government affects regional economic growth and may mediate the returns of European cohesion investment.

Using the quality of government index of the Quality of Government Institute at the University of Gothenburg (CHARRON *et al.*, 2010) and complementing it with World Bank Global Governance Indicators, the results of the panel data analysis for the period between 1996 and 2007 demonstrate that although at first sight quality of government does not appear to affect the economic performance of the regions in Europe, its effect kicks in above a certain threshold of expenditure. When a region receives a level of investment in cohesion and regional development which can be considered more than testimonial, the quality of the local government becomes a vital factor in determining the extent to which a region grows. This is clearly evident for regions where Structural and Cohesion Funds represent more than €80 per head per year. In these regions the importance of quality of government, both as a factor for economic growth on its own and as a mediator for an efficient use of structural Cohesion Funds, increases as the expenditure threshold rises. Beyond levels of cohesion expenditure that exceed €120 per person and per year the most efficient way to achieve greater economic and social cohesion is by improving the quality of government of any given region, except perhaps in a few minority of outlier regions, particularly the Azores and Madeira, where additional funding and cohesion expenditure would counterbalance any potential drawbacks linked to local government quality.

Hence, it can be said that both EU investments targeting regions and quality of government make a difference for regional economic growth, but above a certain threshold of expenditure (which the analysis establishes at levels of cohesion expenditure of around €120 per person per annum), the quality of government

becomes – for the large majority of regions – the basic factor determining why a region grows. In many of the regions receiving the bulk of Structural Funds, greater levels of cohesion expenditure would, in the best-case scenario, only lead to a marginal improvement in economic growth, unless the quality of the government is significantly improved.

Pouring more funds into the region will only do the trick when the amount of funds devoted to regional development significantly multiplies current levels of expenditure.

Overall, the findings contribute to the rapidly expanding literature on how institutions shape economic performance and the returns of economic policy at a regional level in Europe (RODRÍGUEZ-POSE, 2013). As in the case of BEUGELSDIJK and VAN SCHAİK (2005a, 2005b) and TABELLINI (2010), it demonstrates how regional institutions in Europe are key shapers of economic performance. In particular, it has shown that, in the case of European cohesion investment, there are no shortcuts: the returns to investment do not come necessarily from the degree of investment itself, but from the quality of government of the region receiving the support and from how this government quality affects the implementation of policies. Thus, the need to address quality of government bottlenecks in order to maximize the returns of cohesion investment becomes all too evident the greater the level of investment. In these regions, simply spending greater amount of funds in areas with inefficient and/or corrupt governments may lead – without considerable improvements in government quality – to waste.

The findings give support to the broad thrust of recent EU Cohesion Policy changes aimed at shifting to ‘softer’ forms of infrastructure, while simultaneously setting up systems and incentives (linked to results indicators, conditionalities and greater monitoring) targeting the improvement of local governance and institutions. These are concerns that hardly featured in a past policy that was mainly devoted to improving the infrastructure endowment, human capital and innovation capacity of the regions of Europe, but which are central to the 2014 reform. In addition there are important complementarities amongst these policy domains at the local and regional levels (OECD, 2011) that can be realized by improving the quality of local and regional governments. They also raise warning signs for development policies elsewhere around the world. If development policies are to be successful, they should build in an institutional component, including promoting transparency and accountability and dealing with corruption as ways to improve government quality, as an essential part of the strategic planning process. Otherwise the implementation of one-size-fits-all policies may not yield the expected results. Taking into account place-based institutional conditions and learning how institutional quality can be consistently improved, hence

the need to become basic elements of any development strategy (BARCA *et al.*, 2012).

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APPENDIX A

Table A1. Descriptive statistics for key independent variables

Variable	Number of observations	Standard deviation			
		Mean	(SD)	Minimum	Maximum
ln GDP pc	2014	9.902274	0.4368569	8.49093	11.2533
Quality of government	2028	0.2945607	0.8377364	–2.448	1.629
Cohesion expenditure pc	1954	83.23541	119.0134	0	932

Table A2. Correlations for key independent variables

	ln GDPpc	Quality of government	Cohesion expenditure pc
ln GDP pc	1		
Quality of government	0.4433	1	
Cohesion expenditure pc	–0.2373	–0.0805	1

NOTES

1. From an institutional perspective and following the Copenhagen criteria for EU membership, the *Acquis Communautaire* implies democracy, the rule of law, a respect for human rights and the protection of minorities, and a functioning market economy.

2. Although BEUGELSDIJK and EIJJFINGER (2005) report that country-level corruption does not affect the economic returns that could be derived from EU Structural Funds.
3. There are five countries – Belgium, Germany, Greece, the Netherlands and the UK – where TL2 corresponds to NUTS-1 regions. In the rest of European countries, TL2 corresponds to NUTS-2.
4. The 27 states of the EU are covered when the World Bank Global Governance Indicators are included in the main index.
5. Recently the Quality of Government Institute has conducted the same exercise for 2013.
6. Given that the high number of years and variables included in the analysis generates a risk of instrument proliferation (ROODMAN, 2009b), the number of variables are reduced with respect to the original specification. The variables excluded are those with the greatest potential problems of multicollinearity: transport density, employment density and university education. In order to reduce further the number of instruments, only some time lags are considered as a way to identify endogenous variables. The strong persistence of some of the variables makes it advisable to avoid the second- and third-order lags and to start with the fourth-order lags. In addition, the Arellano–Bond serial correlation test (AR test) on residuals rejects the H_0 of no autocorrelation at the 5% level, but does not reject the null hypothesis from the fourth- to higher order lags. Also included is the national growth rate of ln GDP per capita as a country control.
7. The descriptive statistics and correlations for the independent variables of interest are presented in Appendix A, Tables A1 and A2.
8. Additional regressions using different thresholds (€130, €140, €170, €190, €210 and €230) were also estimated. They are not reported because of lack of space, but can be provided by the authors upon request.
9. The interpretation of the interactions in Fig. 3 is done using the simple slope tests developed by AIKEN and

WEST (1991), DAWSON (2014), and DAWSON and RICHTER (2006) to plot interaction effects. As DAWSON (2014) indicates, these tests assess whether that relationship between X and Y is significant at a particular value of Z . Dawson's slope test implies 'substituting the value of Z into the regression equation, i.e., the slope is $b_1 + b_3 Z$, and the standard error of this slope is calculated by $SE_s = \sqrt{s_{11} + Z^2 s_{33} + 2Z s_{13}}$, where s_{11} and s_{33} are the variances of the coefficients b_1 and b_3 , respectively, and s_{13} is the covariance of the two coefficients' (pp. 3–4). 'The significance of a simple slope is then tested by comparing the ratio of the slope to its standard error, i.e., $(b_1 + b_3 Z) / \sqrt{s_{11} + Z^2 s_{33} + 2Z s_{13}}$ with a t -distribution with $n - k - 1$ degrees of freedom, where k is the number of predictors in the model (which is three if no control variables are included)' (p. 4). For various Excel worksheets with which to interpret these interaction effects, see www.jeremydawson.co.uk/slopes.htm.

10. The numbers in Table 4 are derived from the Excel sheet proposed by Dawson for the assessment of interaction effects and used for the elaboration of Fig. 3 (see www.jeremydawson.co.uk/slopes.htm). They represent the additional growth in GDP per head in percentages of increasing quality of government and cohesion expenditure by 1 SD respectively in a low quality of government region at the different thresholds of cohesion expenditure considered.
11. The remaining seven cases were limited to a single year of exceptional expenditure – normally when a programming period was being closed and the regions faced the dilemma of spending the funds or returning them to Brussels – in the Greek regions of Voreia Ellada, Kentriki Ellada, Crete and the Aegean Islands; the Portuguese regions of Alentejo and Algarve; and Extremadura in Spain.
12. The number of time lags is also reduced to the fourth-order lag only as a way to keep instruments similar to the number of groups.

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