

# Application of Regionally Varying Additionality Degrees in the Practice of EU Cohesion Policy

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## Abstract

The additionality principle says that the funds of the European Union should not replace, but be an addition to national regional policy funds. The benchmark for the co-funding is that the EU bears 50% of total costs associated with regional projects eligible for EU support. In some regions, however, the EU contribution has reached 85% of total costs. This study examines how such additionality degrees are determined. Our findings indicate that the regional variation of additionality degrees is largely in line with EU cohesion policy goals. Most notably, higher shares of EU funds are provided to regions with lower GDP per capita. Furthermore, while the share of service-sector employees in a region is negatively related to the additionality degree, the impact of the rate of long-term unemployment is positive.

JEL-Code: H71, H77, H87, O18, R11, R58.

Keywords: additionality, cohesion policy, EU regions, matching grant, growth and distribution.

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## 1. Introduction

In the Treaty Establishing the European Community, economic and social cohesion is defined in terms of reducing regional disparities in the level of development, usually measured by GDP per capita in purchasing power parities. In this context the concept of additionality basically rests on a notion according to which, left to themselves, countries and regions will under-invest in regional infrastructure, human capital as well as R&D and economic activities because of their inability to appropriate all the benefits arising from these activities. Additionality means that the funds of the European Union should not replace, but be an addition to national regional policy funds. More precisely, it is one of the general funding principles by which EU funds for a project are only granted to a member state (and its regions) if the member state (and its regions) also contributes. Consequently, additionality is anticipated to gauge the difference between the presumed underinvestment in regional infrastructure, human capital and economic activities made by a country or a region, on the one hand, and the actual (or planned) joint investment by the country or a region together with the EU, on the other (see Luukkonen, 2000).

As a key principle, additionality is underpinning most EU funding for infrastructure like new roads or bridges, or schemes to help boost job creation in the context of the EU cohesion policy. With the help of the additionality concept, one could claim that EU funds would not directly substitute for national or regional investment in physical infrastructure, education and training, the knowledge economy as well as environmental sustainability, but be somehow additional to that what would have happened anyway (Barnett and Borooh, 1995; Buisseret et al., 1995; Bache, 2008). This means that national governments and/or regional authorities should not expect a free ride from the European Union. However, Ederveen et al. (2002) suggests that EU funds may crowd out national financial support to 'lagging regions' by, on average, 17%, in spite of the co-funding requirement of national or regional governments.

As mentioned above, if funding for a project is covered by the additionality rule, the EU will only provide money for the scheme if national authorities also chip in. The general rule for such an 'input' additionality is a 50-50 split for funding, with half of the money coming from national sources and half from the EU coffers. This is the so-called

‘matching financial principle’, aimed at ensuring the complementary relationship.<sup>1</sup> However, for projects implemented in some poorest regions, the EU contribution has reached 85% of total costs. The initial logic behind the varying co-funding rates of national governments in the EU is simple. For the poor regions, national and regional governments lack financial means to co-finance projects and programmes. Therefore, the requirement of high co-funding rates would prevent the ‘absorption’ of funds in these regions. For such poor regions, a lower co-funding rate of national or regional governments (i.e. a higher additionality degree of the EU funding) is desirable to stimulate economic growth (Ederveen et al., 2002).

As already mentioned, additionality is primarily related to the ‘input’ aspect of EU regional policy. Yet the efficiency of additionality is also often measured in terms of the amount of output from a joint policy as compared with what would have occurred without the EU intervention (Pearce and Martin, 1996). Such a type of policy evaluation has traditionally been an uneasy and challenging task, and a large number of attempts has been carried out on the basis of complicated experimental and modelling approaches that also involve the construction of hypothetical, counterfactual situations in which the regional project is assumed not to have taken place (Armstrong and Taylor, 1985; Rossi and Freeman, 1989; Martin and Tyler, 2006; Bradley, Untiedt and Mitze, 2007; In’t Veld, 2007; Bayar, 2007). Thereby, “a [specific] model of the relevant policy area is

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<sup>1</sup> In general, intergovernmental transfers are aimed at rectifying not only the vertical imbalance caused by the unequal own tax revenues and expenditures of different levels of governments, but also the horizontal imbalance which is led by the different fiscal capacities among same level jurisdictions. Although the local (or regional) expenditure needs appear to be hardly measured in an objective way, the role of transfers becomes more crucial for those deficit jurisdictions on the sub-national level, especially when their increasing expenditures cannot be financed by borrowing or if they lack direct access to capital markets. In the cases of existing externalities on other jurisdictions, the higher-level government also needs to financially support sub-national authorities in order to guarantee the provision of certain public services on the local (or regional) level like pollution control, inter-regional highways, etc. Furthermore, the amount of grants should vary with the local (or regional) expenditure needs and inversely with local fiscal capacity, while their distribution must be transparent and fair. More importantly, an effective transfer system should neither encourage overspending nor weaken tax collection efforts on the sub-national level. Grants from higher (supra-national, federal or state) to lower levels (state, regional or local) can be conditional (i.e. closely tied with specifications regarding the use of the funds and/or the performance achieved in the supported programme), or unconditional, respecting the autonomy of local governments in spending such financial means. The so-called block grants also have a fixed character, which are, however, designed to support broad areas of local (or regional) activities (like education, environmental preservation, etc.) rather than specific projects. On the other hand, intergovernmental grants can be open-ended — regardless of the transfer size required to cover the expenditure needs of individual local governments — or subject to certain limits. In addition, the down-flow grants have been quite often made in the EU on the basis of the so-called additionality principle, which requires — as an eligibility criterion for the supporting grants — the partial financial participation of local governments in providing local goods and services in its territory.

developed and simulations of varying degrees of sophistication are undertaken to ascertain what the level of key [economic] variables [e.g. growth rate, unemployment rate, trade volume, technology development and innovation, accessibility, economic restructuring, etc.] would have been in the absence of the policy (the policy-off situation); these are then compared with actual values of the variables (the policy-on period)” (Barnett and Borooah, 1995, p. 185). Yet, apart from the fact that there has always been widespread recognition of the likely weakness of such a ‘policy-on’ and ‘policy-off’ evaluation, and the necessity of continuous methodological improvements accompanied by a better availability of relevant data, there is no clear consensus on the impact of EU cohesion policy on convergence and economic growth (Ederveen et al., 2002; Leonardi, 2006).

On the other hand, the European Commission adopts a more comfortable (but rather critical) way to test the additionality. According to the European Commission (2006 and 2009), the *ex ante* verification of additionality takes place at *national* level if the real ‘national public structural aid’ (i.e. ‘expenditures by the member states on EU aided programmes’ + ‘expenditures by the member states on programmes similar to those supported by the EU Structural Funds but not in receipt of EU supports’) in a given EU Support Framework period exceeds that in the base year.

Most previous evaluation studies do not systematically investigate why different ‘input’ additionality degrees have been adopted for the eligible regions in the EU, and to what extent such a differentiation can be justified in the context of EU cohesion policy. To a larger extent, the achievement of additionality and its varying degree from one region to another appears to depend on the role which the EU Structural Funds are playing. The Structural Funds can basically be seen as performing three types of policy role: resource allocation, redistribution and one related to ‘*juste retour*’ (Barnett and Borooah, 1995). Regarding the role of resource allocation policy, it is said that challenges resulting from rapid market integration, EU expansion, new technologies and demographic changes lead to structural adjustment in the location of economic activity, and without an active regional policy supported by the EU, the poor and peripheral regions would be worse off – at least in relative terms –, with consequences for competitiveness, employment and social cohesion. In order to solve the problem of a widening economic disparity between the group of poor regions and that of rich regions,

financial transfers appear to be necessary from rich to poor. At the same time, this type of redistributive policy serves to stimulate endogenous economic growth in the poor regions. Consequently, a high additionality degree applied for the eligible regions could generally be justified. Moreover, according to the ‘old’ British view on the role of Structural Funds, the EU cohesion policy is assessed, partly at least, as another type of redistributive policy mechanism designed to enable a fair and acceptable allocation of monies from the EU budget to its member countries, which is also noted by Barnett and Borooah (1995): “The fact that the Structural Funds are paid into national treasuries, rather than directly to the regions, perhaps represents a further facet of this compromise” (Barnett and Borooah, 1995, p. 189).

This paper aims at examining whether the provision of additionality funds is in line with the goals of the EU Cohesion Policy. Since, in the context of EU cohesion policy, not only investment in regional infrastructure and human capital but also, for example, R&D is promoted, policymakers may consider a variety of variables to make decisions about additionality degrees. For this purpose, we investigate various possible determinants of EU contribution ratios. Another issue we address is how the cohesion policy responds – in terms of varying the additionality degrees between budget periods – to, for instance, a rapid growth in GDP per capita.

Our findings indicate that the regional GDP per capita is one important determinant that can explain the share of funds provided to the regions. The preferred specification of our estimations suggests that a 10 percent increase in GDP per capita is associated with a 2.6 (3) percentage point reduction in the additionality degree for the 2000-2006 (2007-2013) period. We can also show that the EU provides a higher share of additional funds to regions lagging behind in terms of the local labour market. More precisely, we find that a higher share of service-sector employees is associated with a lower additionality degree, whereas a higher long-term unemployment rate implies a higher additionality degree.

The study is structured as follows. Section 2.1 gives an overview on the EU cohesion policy, with an emphasis on how funds are allocated and how this changed over time. In Section 2.2 we take a closer look at the additionality degrees of the regions. Subsequently, in Section 3, we describe our data and variables used in the empirical analysis. In Section 4 we present our regression results. The empirical

investigation considers both budget periods (2000-2006 and 2007-2013) and the change of contribution ratios between budget periods. Finally, Section 5 concludes.

## **2 Changes of EU Cohesion Policy Practice and Additionality: A Comparison of Budget Years 2000-2006 and 2007-2013**

### **2.1. Changes of Cohesion Policy**

The EU cohesion policy has been continuously reformed. For instance, the simplification of its structure and the preparation of EU enlargement from EU15 to EU25 were the two major slogans of the period 2000-2006. The latter event has led to increased regional disparities in income and employment in the EU, since the average GDP per capita in the ten new Member States was under half of the EU average and only around 55% of their population were in active employment, compared with approximately 65% in EU15. The entire 2000-2006 budget for the EU cohesion policy amounted to 213 billion euros for the EU15, which was added by an extra sum of 22 billion euros provided exclusively for the new Member States for the period 2004-2006 (European Commission, 2004). The EU aimed at three policy objectives:

- *Objective 1*: promoting the development and structural adjustment of regions in which GDP per capita does not reach 75% of the EU average,<sup>2</sup>
- *Objective 2*: supporting the economic and social conversion of areas facing structural difficulties, and
- *Objective 3*: stimulating the adaptation and modernisation of policies and systems of education, training and employment.

Objective 1 regions cover 37% of the total EU25 population (about 170 million inhabitants). The financial resources provided by the EU Structural Funds – European Regional Development Fund (ERDF), the European Social Fund (ESF), the European Agricultural Guidance and Guarantee Funds (EAGGF) and the Financial Instrument for Fisheries and Guidance (FIFG) – reached around 150 billion euros in the period 2000-2006 under Objective 1 treatment, while additional 25 billion euros were added under

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<sup>2</sup> The new Member States' territory almost completely fell under Objective 1, eligible for the highest possible level of support from the Structural and Cohesion Funds.

the Cohesion Fund. Around 40% of 175 billion euros was spent on infrastructure in this period, of which just under half was allocated to transport and a third to environment. In addition, about 34% and 25% of 175 billion euros were allocated to creating a productive environment for enterprises and to human resources, respectively.

More than 15% of the EU25 population (i.e. 70 million people) lived in Objective 2 areas and benefited from a funding package of around 23 billion euros additionally provided by the ERDF and the ESF in the period 2000-2006. Of this total amount, around 55% was spent on productive environment, supporting particularly SMEs in these regions, 24% on physical regeneration and environment, often for former industrial sites, and the rest 21% on human resources. Focusing on target groups for active labour market policies, programmes under Objectives 3 and 4 had no geographical concentration and were agreed at national level instead. The total amount for both objectives was approximately 24 billion euros provided by the ESF. Furthermore, approx. 12 billion euros were spent for four Community initiatives including Interreg III, Urban II, Equal and Leader+ and other cross-border cooperation projects during the 2000-2006 period (European Commission, 2004).

The Lisbon Agenda agreed by EU leaders at the Lisbon summit in March 2000 aims at making the EU a more competitive and dynamic knowledge-based economy in the world, which would be achieved by economic reforms and growth-enhancing investments. In this regard the European Commission (2007) lays great emphasis on the fact that the cohesion policy should be confluent with the goals of the Lisbon strategy by promoting growth and employment. Consequently, compared to the previous EU financial supports from Structural Funds which used to be concentrated on infrastructure and human capital development, the Lisbon strategy's stress on the knowledge economy raised new policy orientations for the EU cohesion policy.

In the context of the 'new' cohesion policy, around 347 billion euros are being spent over the seven-year period from 2007 to 2013, supporting regional growth and stimulating job creation. More than 80% of total funds (i.e. 283 billion euros) are allocated to the 'Convergence' regions, defined by GDP per capita of less than 75% of the EU average, which account for 35% of the EU's total population. While merging the previous Objectives 2 and 3, some 55 billion euros are being allocated in the remaining regions under the *Regional Competitiveness and Employment* objective. Another 8.7



billion euros are available for cross-border, transnational and interregional cooperation under the *European Territorial Cooperation* objective. The three objectives are supported by the ERDF, the Cohesion Fund and the ESF. The ERDF promotes programmes on regional development, economic change, enhanced competitiveness and territorial cooperation throughout the EU, while the Cohesion Fund mainly supports transport and environment infrastructure, as well as energy efficiency and renewable energy in Member States with a gross national income (GNI) lower than 90% of the EU average.

Under the Convergence objective, ERDF actions will concentrate on strengthening infrastructure, economic competitiveness, research, innovation and sustainable regional development. Under the Competitiveness objective, the ERDF sets three priorities: innovation and the knowledge economy, the environment and risk prevention, and access – away from urban centres – to transport and telecommunication. Throughout the EU, under both the Convergence and the Regional Competitiveness and Employment objectives, the ESF provides support to anticipate and manage economic and social change. There are four key areas for action: increasing adaptability of workers and enterprises; enhancing access to employment and participation in the labour market; reinforcing social inclusion by combating discrimination and facilitating access to the labour market for disadvantaged people; promoting reform in employment and inclusion. Under the Convergence objective, the ESF also supports efforts to improve education and training, and help develop institutional capacity and the efficiency of public administrations. Across all cohesion policy programmes, the main fields of investment and their relative shares of funding are classified into:

- Knowledge and innovation: almost 83 billion euros (24% of 347 billion euros) are being spent on, for example, research centres and infrastructure, technology transfer and innovation in firms, and the development and diffusion of information and communication technologies.
- Transport: about 76 billion euros (22%) have been allocated to improving the accessibility of regions, supporting trans-European networks, and investing in environmentally sustainable transport facilities in urban areas in particular.
- Environmental protection and risk prevention: investments of around 51 billion euros (19%) aim at financing water and waste-treatment infrastructures,

decontamination of land in order to prepare it for new economic use, and protection against environmental risks.

- Human resources: around 76 billion euros (22%) are allocated on education, training, employment and social inclusion schemes financed by the ESF. Other interventions concern the promotion of entrepreneurship, energy networks and efficiency, urban and rural regeneration, tourism, culture and strengthening the institutional capacity of public administrations (see European Commission, 2008).

## 2.2. Dispersion of Additionality Degrees and Their Changes

For the operational programmes officially adopted by the European Commission at the beginning of the budget years, the total costs of regional programmes and the respective EU contributions are reported.<sup>3</sup> These programmes were prepared by each EU member state and present the priorities selected by the national and regional authorities for the corresponding budget period.<sup>4</sup> We are interested in the share of such supra-national grants that are directly addressed to respective regions. We calculate the relevant variable as EU contribution divided by total cost of the regional programme. For the 2000-2006 programme, the EU bears on average 46% of costs incurred by the regions. With respect to the 2007-2013 programme, the average EU contribution rate lies about 10 percentage points higher compared with the earlier period, amounting approx. 57% (see Figure 1 and Table 2 in Section 3).

Figure 1 clearly indicates that the additionality degrees increased from the first to the second budget period. Displayed are standard box plots for the two programme periods. The same figure also demonstrates that some regions are provided with a very high degree of additionality. The region with the highest EU contribution rate in the 2000-2006 period was the *Região Autónoma dos Açores* that belongs to Portugal. The EU provided around 78% of the funds for regional projects in this case. For the 2007-

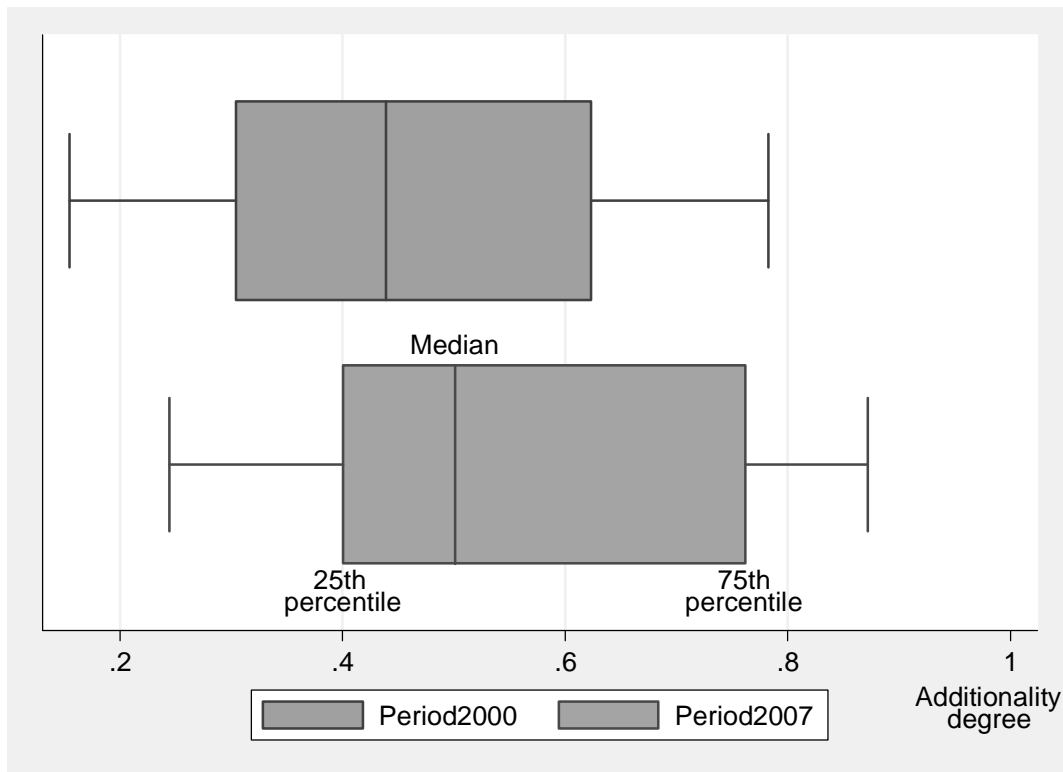
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<sup>3</sup> See [http://ec.europa.eu/regional\\_policy/country/prordn/index\\_en.cfm](http://ec.europa.eu/regional_policy/country/prordn/index_en.cfm). There are also national, multi-regional as well as cross-border regional cooperation programmes which are financially supported by the EU. Yet, for such programmes, the distribution of project costs from one region to another is unclear.

<sup>4</sup> According to the well-known subsidiarity principle, efficiency in the allocation of financial resources is best achieved by assigning responsibility for each type of expenditure to the level of government that most closely represents the beneficiaries of provided public goods and services. In other words, the expenditure assignments involve decisions as to which level of government should be predominantly responsible for the formulation, financing and administration of policy activities and related follow-ups.

2013 period, the maximum share of funds was provided to Lithuania, where around 87% of project costs are contributed by the EU. Figure 1 also reveals that the additionality degree is significantly lower in other regions. The lowest contribution ratio lies at only 16% (2000-2006) and 24% (2007-2013), respectively.

**Figure 1: Dispersion of additionality degree for EU regions in the different budget periods**



Source: Authors' own calculations

In the following, the changes of additionality degrees for the individual EU regions, which are applied in the context of the EU regional support programmes in the budget periods 2000-2006 and 2007-2013, are descriptively examined. For such a comparison, 101 eligible EU regions, for which data is available for both budget periods, are considered. An additionality degree of 50% is set as the benchmark, according to which regions are classified (see Table 1). Firstly, it is to note that, regardless of the budget periods, most Objective 1 regions are located in the fields with the additionality degree over 50%. In particular, the additionality degree of all the investigated German, Spanish and Portuguese Objective 1 regions remained higher than 50% in both surveyed budget periods (see also below).

Of all the investigated EU regions, sixty-two regions benefit from an increased share of EU financial aid ('winners'), while a decrease is reported in thirty regions ('losers'). The additionality degree has remained more or less the same in nine regions including also some Spanish and Finnish Objective 1 regions (*Extramadura, Melilla, Castilla la Mancha, Itä-Suomi* and *Pohjois-Suomi*) in addition to French *Guyana*. As illustrated in Table 1, Austrian and German regions are the clear winners. In contrast, the classification gets rather heterogeneous if the regions in France, Italy and Spain are taken into account. In France, for example, most investigated regions (except *Bretagne* and the three Objective 1 regions *Guadeloupe, Martinique* and *Réunion*) belong to the group with the additionality degree below 50% in both budget periods and the larger share of these regions (including *Île de France, Picardie, Basse-Normandie, Bourgogne, Lorraine*, etc.) was able to increase the additionality degree in the budget period 2007-2013. For Italy, it is particularly noteworthy that all the Objective 1 regions (*Sardegna, Basilicata, Sicilia, Campania, Puglia* and *Calabria*) are classified as losers, i.e. their additionality degrees decreased. Consequently, none of Italian regions belong to the group with the additionality degree over 50% in the latter budget period. Heterogeneity related to the changes of additionality degrees also exists in the group of Spanish Objective 1 regions: five regions (*Galicia, Asturias, Castilla y León, Andalucía* and *Murcia*) could achieve an improvement of the additionality degree, whereas it decreased in *Comunidad Valenciana, Ceuta* and *Canarias* in the budget period 2007-2013.

### **3. Data and Variables Used in the Empirical Investigation**

In order to test how EU policymakers decide on the extent of involvement expressed in terms of additionality degrees, we condition on several explanatory variables. Control variables for the regional entities are taken from different sources (see Table A1 in the Appendix for further information on data sources), including a study of the European Parliament (see European Parliament, 2007), the EU Regio database, and the European Regional Innovation Scoreboard (see Hollanders, 2006).

**Table 1: Classification of EU regions according to additionality degrees and their changes between the budget periods of 2000-2006 and 2007-2013**

		Budget year 2007-2013		
		<i>Additionality degree below 50%</i>	<i>Additionality degree ≈ 50%</i>	<i>Additionality degree over 50%</i>
Budget year 2000-2006	<i>Additionality degree below 50%</i>	Hainaut (B) ↑	Région de Bruxelles-Capitale (B) ↑	Saarland (D) ↑; Schleswig-Holstein (D) ↑
		Hamburg (D) ↑	Navarra (ES) ↑; Aragón (ES) ↑	Bretagne (FR) ↑; <b>Guadeloupe (FR)</b> ↑
		Southern and Eastern Region (IR) ↓	<b>Martinique (FR)</b> ↑	<b>Burgenland (AT)</b> ↑; Vorarlberg (AT) ↑
		Pais Vasco (ES) ↑; La Rioja (ES) ↑; Madrid (ES) ↓; Cataluña (ES) ↑; Illes Balears (ES) ↓	Lazio (IT) ↑	<b>Cornwall and Isles of Scilly (UK)</b> ↑; <b>West Wales and The Valleys (UK)</b> ↑
		Île de France (FR) ↑; Champagne-Ardenne (FR) ↓; Picardie (FR) ↑; Haute-Normandie (FR) ↓; Centre (FR) =; Basse-Normandie (FR) ↑; Bourgogne (FR) ↑; Nord-as-de-Calais (FR) ↓; Lorraine (FR) ↑; Alsace (FR) ↓; Franche-Comté (FR) =; Pays de la Loire (FR) ↑; Poitou-Charentes (FR) ↑; Aquitaine (FR) ↑; Midi-Pyrénées (FR) ↑; Limousin (FR) ↑; Rhône-Alpes (FR) ↑; Auvergne (FR) ↑; Languedoc-Roussillon (FR) ↑; Provence-Alpes-Côte d'Azur (FR) ↑; Corse (FR) ↓; <b>Guyana (FR)</b> =	Niederösterreich (AT) ↑; Wien (AT) ↑; Kärnten (AT) ↑; Steiermark (AT) ↑; Oberösterreich (AT) ↑; Salzburg (AT) ↑; Tirol (AT) ↑	
		Piemonte (IT) =; Valle d'Aosta (IT) =; Liguria (IT) ↑; Lombardia (IT) ↓; Veneto (IT) ↓; Friuli-Venezia Giulia (IT) ↓; Emilia-Romagna (IT) ↓; Toscana (IT) ↑; Umbria (IT) ↑; Marche (IT) ↑; Abruzzo (IT) ↑; Molise (IT) ↓; <b>Sardegna (IT)</b> ↓	Åland (FI) ↑	
		Etelä-Suomi (FI) ↑; Länsi-Suomi (FI) ↑	West Midlands (UK) ↑	
		Highlands and Islands (UK) ↑		

<i>Additionality degree ≈ 50%</i>	Bolzano-Bozen (IT) ↓; <b>Basilicata (IT)</b> ↓; <b>Sicilia (IT)</b> ↓	<b>Itä-Suomi (FI)</b> =; <b>Pohjois-Suomi (FI)</b> =	Bremen (D) ↑
<i>Additionality degree over 50%</i>	<b>Border, Midlands and Western Region (IR)</b> ↓ Lisboa (PT) ↓	Cantabria (ES) ↓ <b>Campania (IT)</b> ↓; <b>Puglia (IT)</b> ↓; <b>Calabria (IT)</b> ↓ <b>Algarve (PT)</b> ↓ Northern Ireland (UK) ↓	<b>Mecklenburg-Vorpommern (D)</b> ↑; <b>Sachsen-Anhalt (D)</b> ↑; <b>Thüringen (D)</b> ↑ <b>Attiki (GR)</b> ↑ <b>Galicia (ES)</b> ↑; <b>Asturias (ES)</b> ↑; <b>Castilla y León (ES)</b> ↑; <b>Castilla la Mancha (ES)</b> =; <b>Extremadura (ES)</b> =; <b>Comunidad Valenciana (ES)</b> ↓; <b>Andalucía (ES)</b> ↑; <b>Murcia (ES)</b> ↑; <b>Ceuta (ES)</b> ↓; <b>Melilla (ES)</b> =; <b>Canarias (ES)</b> ↓ <b>Réunion (FR)</b> ↑ <b>Norte (PT)</b> ↑; <b>Açores (PT)</b> ↑; <b>Madeira (PT)</b> ↑

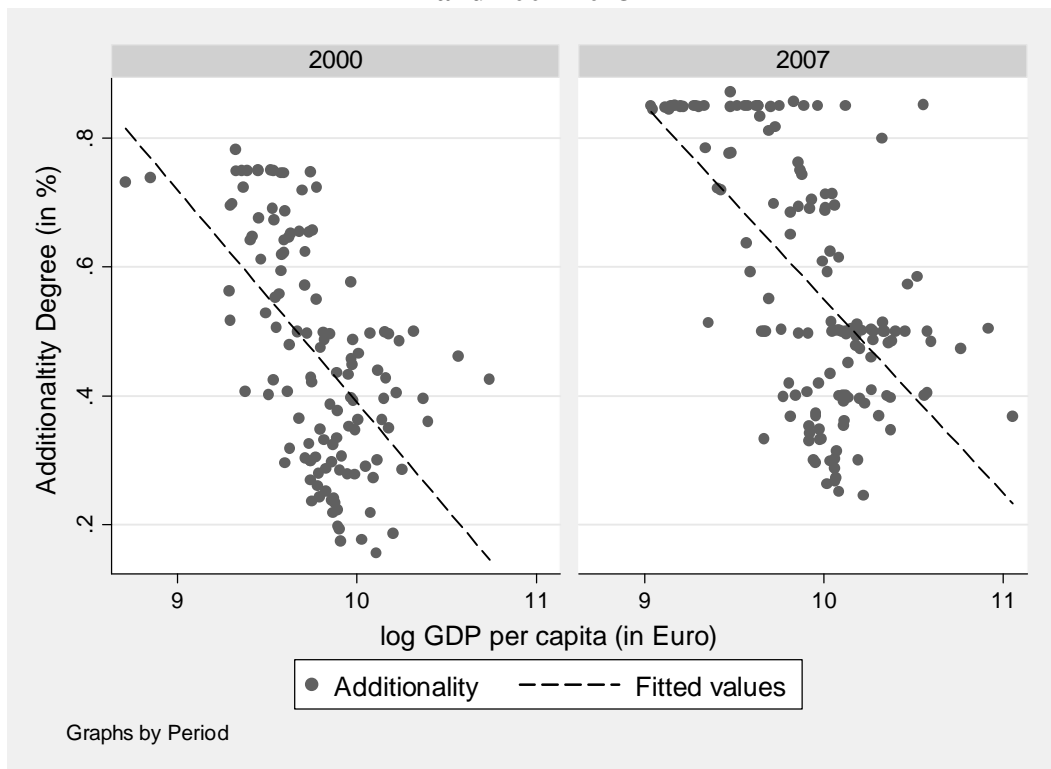
Note: Objective 1 regions are written in bold letters.

The sign ↑ indicates 'increase' ('winners'); ↓ 'decrease' ('losers') and = 'no change', when the additionality degree of a region applied in the budget period 2007-2013 is compared to that adopted in the budget period 2000-2006.

Source: European Commission, Regional Policy – Inforegio, [http://ec.europa.eu/regional\\_policy/country/prordn/index\\_en.cfm](http://ec.europa.eu/regional_policy/country/prordn/index_en.cfm).

Since the basic decision problem of the European Commission is concerned with providing funds to the structurally weak regions, we presume that policymakers use *GDP per capita* (measured in PPS) as an economic yardstick for the extent of financial support. Accordingly, if GDP per capita is high in a region, the European Commission should provide only a low share of financing. Figure 2 displays the relationship between regional GDP per capita (in PPS) and additionality degree. These simple bivariate scatter plots show, as expected, that a higher GDP per capita is associated with a lower additionality degree.<sup>5</sup>

**Figure 2: GDP per capita and additionality degree in the budget periods 2000-2006 and 2007-2013**



Source: Authors' own calculations

While the EU cohesion policy aims at promoting lagging regions, the regional GDP per capita may not be the only measure used by the decision-makers. Variables of particular interest are presumably measures that proxy for features of the local labour market. As the EU intends to promote regions with structural difficulties, one

<sup>5</sup> Note that GDP per capita (in PPS) applied for the development of the 2007-2013 programme refers to the 2006 GDP per capita of the respective region as this should be the relevant figure available to the decision-makers. Correspondingly, we use the 1999 GDP per capita for the 2000-2007 programme.

appropriate variable might be the employment in the *Service* sector relative to total employment. A high share of employment in the service sector indicates that some structural change ('deindustrialization') has already taken place in a region. For this reason, the service variable is expected to exert a negative effect on the additionality degree. Further potentially relevant labour-market variables are the *Unemployment ratio* and the *Long-term unemployment* ratio. The variable for the long-term unemployed refers to the long-term-unemployment-to-total-employment ratio. A high ratio implies that the region is lagging in terms of structural adjustment, suggesting a positive impact on the share of EU funds provided. We also expect that the unemployment ratio relates positively to the share of funds provided. However, whether this holds in a multivariate regression has to be investigated in the next section.

We further control for the local *Population density* and the *Land area* to control for size effects. A variable that may proxy for the level of development of a region is the share of the regional population that lives within 1-hour car driving time from the next airport (*Airport accessibility*). Besides, the variable *GDP accessibility* is an indicator of the size of market areas for suppliers of high-order business services.

Since, according to the Lisbon strategy, one goal of the EU cohesion policy is to stimulate innovation which leads to growth, we also condition on a variable that might capture this aspect. A high score on the 2006 Regional Innovation Scoreboard (*RIS*) is associated with an enhanced performance in terms of innovation. This composite indicator comprises various aspects such as business and public R&D expenditures, employment in high-tech manufacturing and service sector, patent statistics, etc. (see Table A1 in the Appendix). Table 2 provides descriptive statistics for all variables used in our empirical analysis.



**Table 2: Descriptive statistics, programmes 2007-2013 and 2000-2006**

<b>Programme 2007-2013</b>				
Variable	Mean	Standard Error	Minimum	Maximum
Share 2007	.562	.200	.244	.872
ln(GDP per capita)	9.95	.400	9.04	11.05
Service	.648	.094	.442	.887
Unemployment ratio	.087	.038	.026	.192
Long-term unemployment	.397	.148	.121	.679
ln(Population density)	4.75	1.19	1.19	8.75
ln(Land area)	9.52	1.16	5.08	11.94
Airport accessibility	.475	.297	0	1
ln(GDP accessibility)	3.98	1.01	.788	6.46
RIS <sup>(a)</sup>	.416	.155	.070	.900

Notes: 131 observations; <sup>(a)</sup>116 observations. *GDP per capita* refers to the 2006 regional GDP per capita in PPS. *Service* is the ratio of employment in the service sector to total employment in 2005. *Unemployment ratio* is the unemployment rate in 2006. *Long-term unemployment* is measured as long-term unemployed as share of total unemployed persons. *Population density* is the regional population density measured as inhabitant per square kilometre in 2005. *Land area* is the land area of the region measured in square kilometres. *Airport accessibility* is defined as the share of the regional population living within 1-hour car driving time from next airport. *GDP accessibility* is an indicator of the size of market areas for suppliers of high-level business services. *RIS* is an indicator published in 2006 that comprises the overall innovation performance of a region.

Source: Authors' own calculations.

<b>Programme 2000-2006</b>				
Variable	Mean	Standard Error	Minimum	Maximum
Share 2000	.435	.177	.155	.751
ln(GDP per capita)	9.82	.311	8.71	10.74
Service	.677	.083	.475	.887
Unemployment ratio	.090	.052	.022	.26
Long-term unemployment	.411	.128	.135	.679
ln(Population density)	4.93	1.26	1.55	8.70
ln(Land area)	9.20	1.25	5.08	11.80
Airport accessibility	.559	.282	0	1
ln(GDP accessibility)	4.25	1.18	1.34	6.46
RIS <sup>(b)</sup>	.400	.161	.010	.780

Notes: 98 observations; <sup>(b)</sup>88 observations. *GDP per capita* refers to the 1999 regional GDP per capita in PPS. *Service* is the ratio of employment in the service sector to total employment in 2005. *Unemployment ratio* is the unemployment rate in 1999. *Long-term unemployment* is measured as long-term unemployed as share of total unemployed persons. *Population density* is the regional population density measured as inhabitant per square kilometre in 1999. *Land area* is the land area of the region measured in square kilometres. *Airport accessibility* is defined as the share of the regional population living within 1-hour car driving time from next airport. *GDP accessibility* is an indicator of the size of market areas for suppliers of high-level business services. *RIS* is an indicator published in 2006 that comprises the overall innovation performance of a region.

Source: Authors' own calculations.

## 4. Regression Results

### 4.1. Period 2007-2013

The major aim of the empirical investigation is to explain the differences in additionality degrees in the 2007-2013 programme, of which results are presented in Table 3.<sup>6</sup> In a first regression, only the natural logarithm of the GDP per capita is included. As expected, a higher GDP per capita is associated with a lower additionality degree. Note that this specification already explains almost 40% of the variation of our dependent variable. In column II we include further control variables that proxy for different aspects of regional labour markets. We find that a high share of service-sector employment induces the EU to provide a lower share of funds. On the contrary, a higher unemployment ratio leads to a higher additionality degree. However, this variable is not statistically significant. The variable that measures the share of long-term unemployment is also not significantly related to the dependent variable. In column III, we include population density and land area. A higher population density is positively, the size of a region in terms of land area is negatively related to the share of EU funds provided.

We add further control variables in column IV. Note, though, that we lose observations since the new indicators are not available for all regions. While the accessibility of airports is not significant, a better GDP accessibility leads to a lower additionality degree. At the same time, the GDP-per-capita effect becomes less pronounced. Although the coefficient of the innovative performance measured by the RIS indicator is positive, it is statistically not significant.

With respect to the magnitude of effects, the coefficient in column III implies that a 10% increase in GDP per capita leads to a 3 percentage point lower additionality degree. 10 percentage points less employment in the service sector is associated with a 5 percentage point increase in the share of funds provided by the EU.

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<sup>6</sup> To begin with, we investigate the 2007-2013 budget period, since this is the recent time horizon and, moreover, the availability of data (also the number of regions eligible for EU funds) is better, compared with the earlier period.

**Table 3: Results (2007-2013)**

	I	II	III	IV
ln(GDP per capita)	-0.311*** [0.035]	-0.182** [0.072]	-0.301*** [0.075]	-0.159** [0.073]
Service		-0.513** [0.230]	-0.501** [0.177]	-0.712*** [0.222]
Unemployment ratio		0.467 [0.990]	0.457 [0.847]	0.135 [0.809]
Long-term unemployment		0.114 [0.243]	-0.190 [0.240]	-0.070 [0.240]
ln(Population density)			0.028 [0.021]	0.071* [0.038]
ln(Land area)			-0.033* [0.019]	-0.039 [0.025]
Airport accessibility				-0.100 [0.064]
ln(GDP accessibility)				-0.097** [0.039]
RIS				0.173 [0.144]
Observations	131	131	131	116
R-squared	0.386	0.415	0.482	0.513

Notes: OLS estimation, including an intercept (not reported). Robust standard errors (clustered by country) in brackets. If available, all control variables refer to 2006 values (see Table 2 for further definitions of control variables). \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

Source: Authors' own calculations.

#### 4.2. Period 2000-2006

In Table 4 we investigate the earlier programme by replicating the above regression analysis. The number of observations is now smaller and we have the problem that not all control variables are available for the year 1999. Since information from this year was probably the basis for the EU's decision-making, the results need careful interpretation. Nonetheless, the findings are basically consistent compared with the results of the budget period of 2007-2013.

The regional GDP per capita is again negatively related to the share of funds provided. According to column III, a 10% increase in GDP per capita leads to a 2.6 percentage point lower additionality degree, which is quite similar to the case of the 2007-2013 period. The most noticeable difference between the samples of the different programme periods is that the measure for long-term unemployment is now highly significant. According to specification II, a ten percentage point higher share of long-

term unemployed is associated with a 4 to 5 percentage point, depending on the specification, higher EU contribution rate. The GDP per capita variable loses some significance as soon as we include GDP accessibility in column IV. If the RIS index is included in specification V, GDP per capita is no longer significant. Note, however, that this result should not be overemphasized, as the RIS variable is not available for all regions and the number of observations is reduced to 88. Despite the fact that periods 2000-2006 and 2007-2013 are not thoroughly comparable, it seems that the goal of the 2000-2006 period was to provide funds to regions where long-term unemployment is an issue.

**Table 4: Results (2000-2006)**

	I	II	III	IV	V
ln(GDP per capita)	-0.315*** [0.095]	-0.252*** [0.084]	-0.263*** [0.075]	-0.072* [0.042]	-0.041 [0.053]
Service		-0.102 [0.240]	-0.314 [0.261]	-0.398 [0.262]	-0.277 [0.298]
Unemployment ratio		-0.304 [0.578]	0.068 [0.553]	-0.319 [0.329]	-0.490 [0.352]
Long-term unemployment		0.566*** [0.188]	0.453** [0.168]	0.441*** [0.137]	0.486** [0.182]
ln(Population density)			-0.010 [0.021]	0.069*** [0.015]	0.075*** [0.021]
ln(Land)			-0.040 [0.029]	-0.013 [0.012]	0.002 [0.012]
Airport accessibility				-0.059 [0.058]	-0.057 [0.059]
ln(GDP accessibility)				-0.120*** [0.018]	-0.109*** [0.023]
RIS					-0.216 [0.137]
Observations	98	98	98	98	88
R-squared	0.308	0.435	0.476	0.688	0.713

Notes: OLS estimation, including an intercept (not reported). Robust standard errors (clustered by country) in brackets. If available, all control variables refer to 1999 values (see Table 2 for further definitions of control variables). \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

Source: Authors' own calculations.

## 4.2. Change in Additionality Degrees

In Table 5 we consider the change in the share of funds provided by the EU. Since some variables do not vary over time, e.g. the land area, or no time-varying data is available

for indicators like GDP accessibility, the number of explanatory variables is now reduced. Column I provides results where the change in the region's GDP per capita is used as the only right-hand side variable. The positive coefficient means that a rise in GDP per capita is reflected in a higher additionality degree. This result should be interpreted very carefully and rather descriptively, as endogeneity issues may be important here. Column II reveals that an increase in unemployment leads to a higher degree of additionality, which is in line with the goals of the cohesion policy.

Finally, in column III, we include the 1999 GDP per capita to control for level effects. The results are very similar to the findings in columns I and II and the coefficients for the change in GDP per capita and the change in Population density are exactly the same.

**Table 5: Change in additionality**

	I	II	III
ln ( $\Delta$ GDP per capita)	0.063** [0.025]	0.077** [0.030]	0.077** [0.031]
$\Delta$ Unemployment ratio		1.314* [0.672]	1.299 [0.739]
$\Delta$ Population density		-0.001* [0.000]	-0.001* [0.000]
ln (GDP per capita in 1999)			0.005 [0.058]
Observations	102	71	71
R-squared	0.083	0.285	0.286

Notes: OLS estimation, including an intercept (not reported). Robust standard errors (clustered by country) in brackets. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

Source: Authors' own calculations.

## 5. Conclusions

We have investigated how the EU decides on the scope of grants that are provided to regions to support local projects. In this context, the concept of additionality is important, because EU funds are only provided if nations (and/or regions) also contribute own funds to co-finance these projects. Hence, additionality degrees indicate the share of total costs of regional projects that are borne by the EU. Such additionality degrees vary significantly across regions. In some cases the figure amounts to more than 85%, whereas in other cases the EU contributes less than 20%.

We use data from the EU regional programme database that includes total costs of regional programmes and the funds that are contributed by the EU. We use this information to calculate additionality degrees, which we then examine in regression analyses. Our findings suggest that the additionality degree is mainly determined by the regional GDP per capita, which is in line with the EU cohesion policy goals. Our estimated coefficients suggest that a 10% higher GDP per capita (measured in PPS) is associated with a 2.6 (3) percentage point reduction in the additionality degree for the 2000-2006 (2007-2013) period. Another finding is that a higher share of employees in the service sector is associated with a lower additionality degree. Finally, a higher share of long-term unemployment implies a higher additionality degree.

Our main conclusion is that the EU expenditure practice made in terms of the Structural Funds is largely in line with cohesion policy goals. However, we are not able to explain all of the variation of additionality degrees with independent variables that are available from official data sources. The remaining variation may, for example, be explained by differences in negotiation and bargaining power or by strategies of the national and regional representatives. A higher degree of transparency concerning the allocation of funds would certainly help to make this process more efficient. Further insights may also be useful to improve the quality of future evaluation studies as to whether EU funds tend to crowd out national funds.

## Appendix

**Table A1: Variable description and data sources**

<i>Variable</i>	<i>Description</i>	<i>Database</i>
Share 2000	Funds provided by the EU relative to total expenditures for the budget period 2000-2006	EU Regional programme 2000-2006
Share 2007	Funds provided by the EU relative to total expenditures for the budget period 2007-2013	EU Regional programme 2007-2013
GDP per capita	Regional GDP per capita (in PPS); yearly data 1999-2006	EU Regio database
Service	Employment in service sector (in % of total employment in 2005)	EU Regio database
Unemployment ratio	Unemployment rate 1999-2006	EU Regio database
Long-term unemployment	Long-term unemployment in 2005 as share of total unemployed persons	EU Regio database
Population density	Regional population density measured as inhabitant per square kilometre (1999-2006)	EU Regio database
Land area	Land area in square kilometre	EU Regio database
Airport accessibility	Share of regional population living within 1 hour car driving time from next airport	Study of the European Parliament (2007)
Potential GDP accessibility**	An indicator of the size of market areas for suppliers of high-level business services, standardized at EU27+2***	Study of the European Parliament (2007)
RIS (Regional Innovation Scoreboard) 2006*	A re-scaled synthetic indicator showing the overall innovation performance of regions in the EU	Hollanders (2006)

\* The RIS 2006 is calculated based on a set of seven determinants, capturing human resource and knowledge creation indicators from different statistical sources such as labour force survey, R&D statistics and patent statistics. These seven determinants include: (1) human resources in science and technology – core (% of population in 2004), (2) participation in life-long learning (% of 25–64 years age class in 2004), (3) employment in medium-high and high-tech manufacturing (% of total workforce in 2004), (4) employment in high-tech services (% of total employment in 2004), (5) public R&D expenditures (total R&D expenditures – business expenditures on R&D) (% of GDP in 2002), (6) business expenditures on R&D (% of GDP in 2002), and (7) The European Patent Office (EPO) patent applications (per million population in 2002).

\*\* Potential accessibility is measured based on the assumption that the attraction of a destination increases with size, and declines with distance, travel time or cost. Destination size is usually represented by GDP or population. In other words, the potential accessibility is a construct of two functions, the *activity function* representing the activities or opportunities to be reached and the *impedance function* representing the effort, time, distance or cost needed to reach them. For potential accessibility the two functions are combined multiplicatively.

\*\*\* Switzerland and Norway.

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