Application of Regionally Varying Co-financing Degrees in the Practice of EU Cohesion Policy

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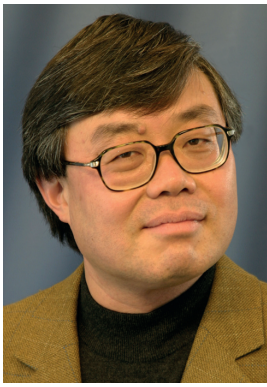

In the Treaty Establishing the European Community, economic and social cohesion is defined in terms of reducing regional disparities in the level of development, usually measured by GDP per capita in purchasing power parities. To accomplish the cohesion goals and to promote and support the overall harmonious development of its member states, the EU contributes by co-financing the costs associated with regional projects. Such co-financing activities are subject to the so-called additionality principle, which is one of the general funding principles driving the functioning of the EU's cohesion policy. Additionality means that the regional funds of the EU should not replace, but be an *addition* to national regional policy funds. In fact, 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). While national governments and/or regional authorities should not expect a free ride from the European Union (Barnett and Borooah 1995; Buisseret *et al.* 1995; Bache 2008), Ederveen *et al.* (2002) suggests that EU funds may crowd out national financial support to 'lagging regions' by, on average, 17 percent, in spite of the co-funding requirement of national or regional governments.

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If funding for a regional project is covered by the additionality rule, the EU will only provide money for the scheme if national authorities also chip in. The *ex ante* rule for such an 'input' additionality appears to be a 50-50 split for funding, with half of the money coming from national sources and the other half from the Union coffers. This is the so-called 'matching co-financing principle' aimed at ensuring the complementary relationship. However, for projects implemented in some poorest regions, the EU contribution has reached 85 percent of total costs. The initial logic behind the varying co-funding rates of national governments in the EU is that, for the poor regions, national and regional governments lack financial means to co-finance projects and programmes. For such poor regions a lower co-funding rate of national or regional government (i.e. a higher additionality degree of the EU funding) is desirable to stimulate economic growth (Ederveen *et al.* 2002). Yet the EU's cohesion policy practice shows that the co-financing rate has also been widely varied from one region to another, although these regions are classified into the same promotion group.

Few previous empirical studies have investigated the reasons why different co-financing degrees have been adopted for the eligible regions in the EU, and the extent to which such a differentiation can be justified in the context of EU cohesion policy. Since not only investment in regional infrastructure and human capital but also new business start-ups as well as R&D and innovation are financially promoted by the EU regional funds, the EU should also adequately consider a variety of relevant variables when making decisions about the co-financing degrees for the individual regions. In this context, this study primarily attempts to examine whether the co-financing practice is in line with the goals of the EU cohesion policy.

Changes in the EU cohesion policy practice: a comparison of budget years 2000–2006 and 2007–2013

Changes in cohesion policy

The EU cohesion policy has been continuously reformed. For instance, the simplification of its struc-

ture and the preparation of EU enlargement from EU15 to EU25 were the two major focuses of the period 2000–2006. EU enlargement 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 percent of their population was in active employment, compared to approximately 65 percent in EU15. The entire 2000–2006 budget for the EU cohesion policy amounted to 213 billion euros for the EU15, to which an extra sum of 22 billion euros provided exclusively for the new member states for the period 2004–2006 was added (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 percent of the EU average,[1]
- *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 percent 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 an additional 25 billion euros were added under the Cohesion Fund. Around 40 percent of 175 billion euros was spent on infrastructure in this period, of which just under half was allocated to transport and a third to the environment. In addition, about 34 percent and 25 percent of 175 billion euros were allocated to creating a productive environment for enterprises and to human resources, respectively.

More than 15 percent 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 percent was spent on the productive environment, supporting particularly SMEs in these regions, 24 percent on the physical regeneration and environment, often for former industrial sites, and the remaining 21 percent 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 the 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 on 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 upon 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 should 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 in accord 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 introduced 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, to support regional growth and stimulate job creation. More than 80 percent of total funds (i.e. 283 billion euros) are allocated to the 'Convergence' regions, defined by GDP per capita of less than 75 percent of the EU average, which account for 35 percent 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 envi-

[1] The new EU member states' territory almost completely fell under Objective 1, eligible for the highest possible level of support from the Structural and Cohesion Funds.

ronment infrastructure, as well as energy efficiency and renewable energy in Member States with a gross national income (GNI) lower than 90 percent 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 percent 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 percent) 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 percent) 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 percent) are allocated to 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).

Dispersion of co-financing 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.[2] 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. We are interested in the share of such supra-national grants that are directly addressed to respective regions. We calculate the relevant variable as the EU contribution divided by the total cost of the regional programme. For the 2000–2006 programme, the EU bears on average 44 percent of costs incurred by the regions. With respect to the 2007–2013 programme, the average EU contribution rate lies about 12 percentage points higher compared with the earlier period, amounting to approx. 56 percent (see Figure 1 and Table 2 below).

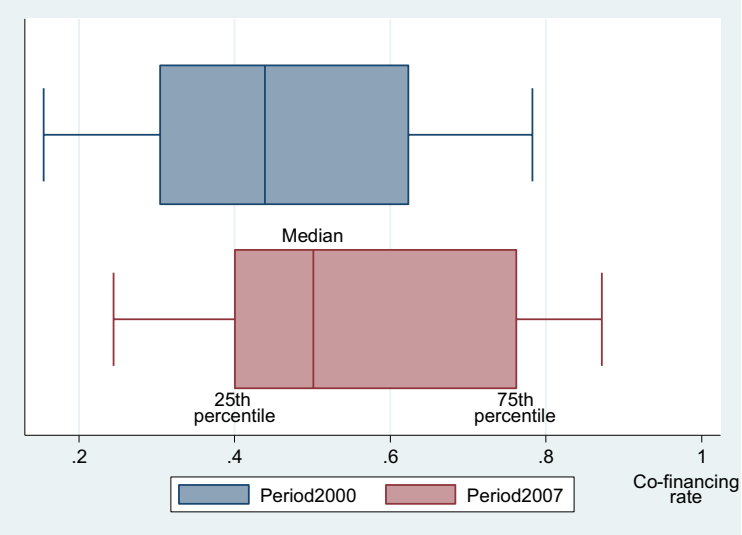
Figure 1 clearly indicates that the co-financing rates increased from the first to the second budget period. Displayed are standard box plots for the two programme periods. The same figure also demonstrates that some regions are provided with a very high degree of co-financing. The region with the highest EU contribution rate in the 2000–2006 period was the *Região Autónoma dos Açores* that belongs to Portugal. The EU provided around 78 percent of the funds for regional projects in this case. For the 2007–2013 period, the maximum share of funds was provided to Lithuania, where around 87 percent of project costs are contributed by the EU. Figure 1 also reveals that the co-financing degree is significantly lower in other regions. The lowest contribution ratio lies at only 16 percent (2000–2006) and 24 percent (2007–2013), respectively.

In the following, the changes of co-financing 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

[2] See 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.

Figure 1

DISPERSION OF CO-FINANCING RATES FOR EU REGIONS IN THE DIFFERENT BUDGET PERIODS



Source: Authors' own calculations.

2007–2013, are descriptively examined. For such a comparison, 101 eligible EU regions, for which data is available for both budget periods, are considered. A co-financing degree of 50 percent is set as the benchmark, according to which regions are classified (see Table 1). Firstly, it is to be noted that, regardless of the budget periods, most Objective 1 regions are located in areas with a co-financing degree of over 50 percent. In particular, the co-financing rates of all the investigated German, Spanish and Portuguese Objective 1 regions remained higher than 50 percent 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 co-financing degree has remained more or less the same in nine regions including also some Spanish and Finnish Objective 1 regions *(Extramadura, Melila, 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 becomes quite 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 co-financing rate below 50 percent 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 co-financing 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 co-financing degrees decreased. Consequently, none of Italian regions belong to the group with a co-financing rate of over 50 percent in the latter budget period. Heterogeneity related to the changes of co-financing also exists in the group of Spanish Objective 1 regions: five regions *(Galicia, Asturias, Castilla y León, Andalucia* and *Murcia)* were able to achieve an improvement of the co-financing rate, whereas it decreased in *Communidad Valenciana, Ceuta* and *Canarias* in the budget period 2007–2013.

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 co-financing rates, we employ several explanatory variables: according to the Council of the European Union (2006), cohesion policy should take into account economic, social and territorial characteristics. 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).

Since the basic decision-making problem of the European Commission is concerned with providing funds to the structurally weak regions, we presume that EU 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 the regional GDP per capita (in PPS) and the co-financing rate. These simple bivariate scatter plots show, as expected, that a

Table 1

Classification of EU regions according to co-financing degrees and their changes between the budget periods of 2000–2006 and 2007–2013

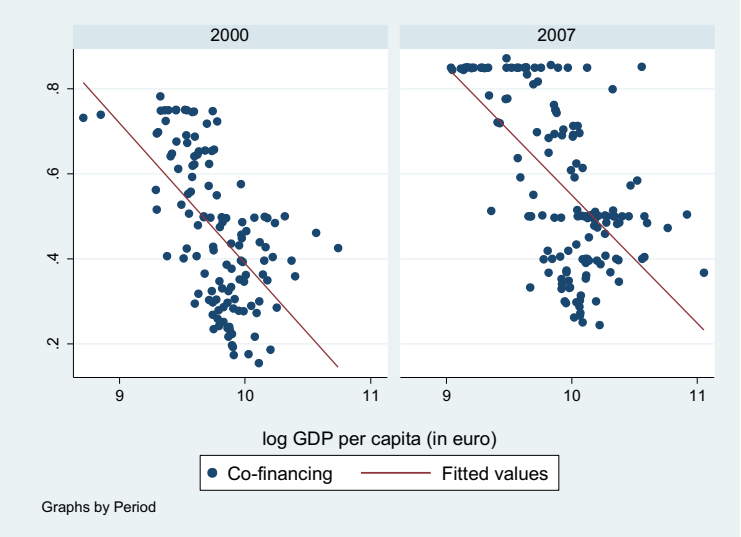
		Budget year 2007–2013		
		Co-financing degree below 50%	*Co-financing degree ≈ 50%*	*Co-financing degree over 50%*
Budget year 2000–2006	*Co-financing degree below 50%*	Hainaut (B) ↑ Hamburg (D) ↑ Southern and Eastern Region (IR) ↓ Pais Vasco (ES) ↑; La Rioja (ES) ↑; Madrid (ES) ↓; Cataluña (ES) ↑; Illes Balears (ES) ↓ 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) ↓; **Guyana (FR) =** 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) ↓; **Sardegna (IT)** ↓ Etelä-Suomi (FI) ↑; Länsi-Suomi (FI) ↑ Highlands and Islands (UK) ↑	Région de Bruxelles-Capitale (B) ↑ Navarra (ES) ↑; Aragón (ES) ↑ **Martinique (FR)** ↑ Lazio (IT) ↑ Niederösterreich (AT) ↑; Wien (AT) ↑; Kärnten (AT) ↑; Steiermark (AT) ↑; Oberösterreich (AT) ↑; Salzburg (AT) ↑; Tirol (AT) ↑ Åland (FI) ↑ West Midlands (UK) ↑	Saarland (D) ↑; Schleswig-Holstein (D) ↑ Bretagne (FR) ↑; **Guadeloupe (FR)** ↑ **Burgenland (AT)** ↑; Vorarlberg (AT) ↑ **Cornwall and Isles of Scilly (UK)** ↑; **West Wales and The Valleys (UK)** ↑
	Co-financing degree ≈ 50%	Bolzano-Bozen (IT) ↓; **Basilicata (IT)** ↓; **Sicilia (IT)** ↓	**Itä-Suomi (FI)** =; **Pohjois-Suomi (FI)** =	Bremen (D) ↑
	Co-financing degree over 50%	**Border, Midlands and Western Region (IR)** ↓ Lisboa (PT) ↓	Cantabria (ES) ↓ **Campania (IT)** ↓; **Puglia (IT)** ↓; **Calabria (IT)** ↓ **Algarve (PT)** ↓ Northern Ireland (UK) ↓	**Mecklenburg-Vorpommern (D)** ↑; **Sachsen-Anhalt (D)** ↑; **Thüringen (D)** ↑ **Attiki (GR)** ↑ **Galicia (ES)** ↑; **Asturias (ES)** ↑; **Castilla y León (ES)** ↑; **Castilla la Mancha (ES)** =; **Extremadura (ES)** =; **Comunidad Valenciana (ES)** ↓; **Andalucia (ES)** ↑; **Murcia (ES)** ↑; **Ceuta (ES)** ↓; **Melilla (ES)** =; **Canarias (ES)** ↓ **Réunion (FR)** ↑ **Norte (PT)** ↑; **Açores (PT)** ↑; **Madeira (PT)** ↑

Note: Objective 1 regions are written in bold letters.
The sign ↑ indicates 'increase' ('winners'); ↓ 'decrease' ('losers') and = 'no change', when the co-financing 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.

Figure 2

GDP PER CAPITA AND CO-FINANCING DEGREE IN THE BUDGET PERIODS 2000–2006 AND 2007–2013



Source: Authors' own calculations.

We further control the local *Population density* and the *Land area* to control for size effects. Such geographic variables might be important as, according to the Council of the European Union (2006, 26), "the outermost regions should benefit from specific measures and additional funding. [In particular] the problems of accessibility and remoteness from large markets confronting areas with an extremely low population density […] require appropriate financial treatment to offset the effects of these handicaps". In this context, reference is further made to regions with 'natural handicaps', such as a low population density.

higher GDP per capita is associated with a lower co-financing degree.[3]

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.[4] 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 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 co-financing degree. Further potentially relevant labour-market variables are the *Unemployment ratio and the Long-term unemployment* ratio. A high long-term unemployment 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 will be investigated in the next section.

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 drive from the next airport *(Airport accessibility)*. Moreover, 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 include 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 the service sector, patent statistics, etc. (see Table A1 in the Appendix). Table 2 provides descriptive statistics for all variables used in our empirical analysis.

Regression results

Period 2007–2013

The major aim of the empirical investigation is to explain the differences of co-financing degrees prevailing in the 2007–2013 programme, of which the results are presented in Table 3.[5] In a first regression,

[3] 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.
[4] A list of determinants shaping the co-financing degrees of an eligible region and the way how such rates are calculated are not yet documented in an official publication of the EU.

[5] 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 2

Descriptive statistics, programmes 2007–2013 and 2000–2006

Programme 2007–2013

Variable	Mean	Standard error	Minimum	Maximum
Co-financing rate 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[a)]	.416	.155	.070	.900

Notes: 131 observations; [a)] 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.

Programme 2000–2006

Variable	Mean	Standard error	Minimum	Maximum
Co-financing rate 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[b)]	.400	.161	.010	.780

Notes: 98 observations; [b)] 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.

only the natural logarithm of the GDP per capita is taken into account. As expected, a higher GDP per capita is associated with a lower co-financing rate. Note that this specification already explains almost 40 percent 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. In contrast, a higher unemployment ratio leads to a higher co-financing rate. 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, population density and land area are additionally included. A higher population density is positively correlated with the share of EU funds provided, to which however the size of a region in terms of land area is negatively related.

We add further control variables in column IV. Note, though, that we lose observations since the new indicators are not available for all the investigated EU regions. While the accessibility of airports is not significant, a better GDP accessibility leads to a lower co-financing degree. At the same time, the GDP-per-

Table 3

Regression results (2007–2013)

	I	II	III	IV
ln (GDP per capita)	– 0.311***	– 0.182**	– 0.301***	– 0.159**
	[0.035]	[0.072]	[0.075]	[0.073]
Service		– 0.513**	– 0.501**	– 0.712***
		[0.230]	[0.177]	[0.222]
Unemployment ratio		0.467	0.457	0.135
		[0.990]	[0.847]	[0.809]
Long-term unemployment		0.114	– 0.190	– 0.070
		[0.243]	[0.240]	[0.240]
ln (Population density)			0.028	0.071*
			[0.021]	[0.038]
ln (Land area)			– 0.033*	– 0.039
			[0.019]	[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.

capita effect becomes less pronounced. Although the coefficient of the innovative performance measured by the RIS indicator is positive, it is statistically less significant.

With respect to the magnitude of effects, the coefficient in column III implies that a 10 percent increase in GDP per capita leads to a 3 percentage point lower co-financing rate. 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.

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 the 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 percent increase in GDP per capita leads to a 2.6 percentage point lower co-financing rate, 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 the specification II, a ten percentage point higher share of long-term unemployed is associated with a 4 to 5 percentage point higher EU contribution rate, depending on the specification. The GDP per capita variable loses some significance as soon as GDP accessibility is included as shown in column IV. If the RIS index is additionally considered 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.

Change in co-financing 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 co-financing 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

Table 4

Regression results (2000–2006)

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

unemployment leads to a higher degree of co-financing, 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 similar to the findings in columns I and II, while the coefficients for the change in GDP per capita and the change in Population density are exactly the same.

Concluding remarks

Based on data obtained from the EU regional programme database we calculated the co-financing degrees for the individual EU regions. Such degrees have been widely varied from one eligible region to another, although they belong to the same promotion group of the EU cohesion policy. Our empirical findings suggest that the co-financing rate is largely determined by the regional GDP per capita, which is in line with the EU cohesion policy goals. Our estimated coefficients suggest that a 10 percent higher GDP per capita (measured in PPS) is associated with a 2.6 (3) percentage point reduction in the co-financing degree for the 2000–2006 *(2007–2013)* period. We also find that a higher share of employees in the service sector is associated with a lower co-financing rate and that a higher share of long-term unemployment implies a higher co-financing rate. Yet the general explanatory power of the regression model explaining the co-financing rates of the recent EU programme periods seems to be rather disappointing: we were not able to explain all of the variations of co-financing rates with independent variables that are available from official data sources. In particular, variables capturing regional innovation activities (e.g. RIS) are not significantly related to co-financing rates. A higher degree of transparency concerning the determination of the regional co-financing rates would make the EU cohesion policy design more effective and would also enable the implementation of its support measures in a more efficient way.

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Table 5

Change in co-financing

	I	II	III
ln (Δ GDP per capita)	0.063**	0.077**	0.077**
	[0.025]	[0.030]	[0.031]
Δ Unemployment ratio		1.314*	1.299
		[0.672]	[0.739]
Δ Population density		– 0.001*	– 0.001*
		[0.000]	[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.

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Appendix

Appendix

Table A1

Variable description and data sources

Variable	*Description*	*Database*
Co-financing rate 2000	Funds provided by the EU relative to total expenditures for the budget period 2000–2006	EU regional programme 2000–2006
Co-financing rate 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 EU 27+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.