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*Section* ARTICLES

Investigaciones Regionales

# Territorial Capital and the Effectiveness of Cohesion Policies: an Assessment for CEE Regions

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**ABSTRACT:** On May 1st 2004, 10 Central and Eastern European (CEE) countries joined the EU and became fully eligible for communitarian financial support. While the conditions for eligibility are the same, at regional level CEE territories are characterized by very different socioeconomic settings. In particular, different regions are differently endowed with what has been labelled "territorial capital', so that the endowment of public and private, material and immaterial assets significantly varies across regions, including infrastructure, private capital, human and social capital. This set of territorial conditions, enabling economic development to take place, is here assumed to impact the outcome of cohesion policies as well. This paper is hence aimed at assessing the role of specific territorial conditions on the efficient implementation of cohesion policies in CEE NUTS3 regions. The analysis points out the mechanisms through which the endowment of specific territorial assets affects the outcome of Cohesion policies. It appears that for a large number of territorial capital assets, increasing returns are present and regions more endowed with specific types of territorial capital are more able to gain from policy investment in related fields.

**JEL Classification:** R10; R11; R58.

**Keywords:** Territorial Capital; Cohesion Policy; Central and Eastern European Countries.

## Capital Territorial y efectividad de la Política de Cohesión Europea

**RESUMEN:** El 1 de mayo de 2004, diez países del centro y este de Europa se unieron a la UE y se convirtieron en elegibles para recibir financiación comunitaria. Aunque los criterios de elegibilidad son los mismos, a nivel regional los territorios de los países del centro y este de Europa se caracterizan por tener condiciones socioeconómicas muy distintas. En particular, las distintas regiones tienen unas dotaciones muy diferentes de lo que se ha denominado «capital territorial», de manera

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que la dotación de activos públicos y privados, materiales e inmateriales varía de forma significativa entre los distintos territorios. Este conjunto de condiciones territoriales, que facilita que el desarrollo económico tenga lugar, se asume en el contexto de este trabajo que afecta también a los resultados de la política de cohesión. Este trabajo tiene por tanto como objetivo evaluar el papel y las condiciones territoriales específicas que tienen sobre la implementación eficiente de las políticas de cohesión a nivel de regiones NUTS3 en los países del CEE. El análisis señala los mecanismos a través de los cuales la dotación de activos territoriales específicos afectan a los resultados de las políticas de cohesión. Parece que una mayor dotación de activos territoriales específicos conlleva la presencia de rendimientos crecientes, y que las regiones mejor dotadas con tipos específicos de capital territorial son más capaces de obtener ganancias a partir de las inversiones realizadas en los diferentes campos.

**Clasificación JEL:** R10; R11; R58.

**Palabras clave:** Capital territorial; Política de Cohesión; Países del centro y este de Europa.

## 1. Introduction [1]

On May 1st 2004, Central and Eastern European (CEE) countries (with the exception of Romania and Bulgaria) joined the EU and became fully eligible for the Communitarian financial support. The vast majority of CEE regions shared the same macroeconomic conditions for funding eligibility, being most of them included in the Objective 1 category [2]. Between 2004 and 2006 more than 21 billion euro were invested in projects and policies aimed at fostering the development and structural adjustment of CEE regions.

Despite the abovementioned homogeneity in the conditions for eligibility, however, these regions were characterized by very different systems of territorial assets of economic, cultural, social and environmental nature. As pointed out by Camagni (2008) these elements, included under the comprehensive concept of territorial capital, represent the development potential of places. In the words of the EU Commission itself, the regional endowments of territorial capital raise relevant policy implications, as «each region has a specific "territorial capital" that is distinct from that of other areas and generates a higher return for specific kinds of investments than for others, since these are better suited to the area and use its assets and potential more effectively» (European Commission, 2005, p. 1).

The aim of the present paper is to provide evidence on the relationship between the structural characteristics of the recipient regions of funds and the impact of the EU financial support on economic growth in CEE NUTS3 areas. The assumption

[1] The research leading to these results has received partial funding from the European Union's Seventh Framework Programme (FP7/2007-2013) under grant agreement «Growth-Innovation-Competitiveness: Fostering Cohesion in Central and Eastern Europe» (GRINCOH).

[2] All NUTS3 regions are included in the Objective 1 category apart from Prague and Bratislava.

to be tested is that the outcome of public policies is mediated and reinforced by the presence of territorial capital. The focus on CEE regions is motivated by two reasons. First of all since, contrary to Western countries, all these regions became eligible for EU funding simultaneously; therefore there is not any asymmetry to be taken into account, such as learning effects on the capability of efficiently managing the resources. Secondly, as stated above, almost all regions are eligible for the same EU actions, i.e. those of the Objective 1 program.

This work places itself in the long stream of research focused on the outcomes of EU regional policies. To the best of our knowledge, however, almost none of these works systematically considered the role of the characteristics of receptive territories on the impact of the Cohesion policies.

The article is organized as follows. The next section is devoted to the definition of what is meant by territorial capital and to a brief review of the typologies of structural funds and of the literature on their impact on economic development. The third section is aimed at pointing out the link between territorial capital and EU funds and the mechanisms through which these two elements are expected to generate economic growth. Following some descriptive evidence on the data used in the present study, the fourth section presents the estimation methodology and the fifth one focuses on the interpretative analysis of the role of territorial capital in fostering the impact of EU funds. Finally, the last section summarizes the main conclusions and discusses which policy prescriptions stem from the analysis.

## 2. Territorial capital and the outcome of regional EU policies: evidence from the literature

### 2.1. Territorial capital

The literature on endogenous regional growth identified several factors impacting the macroeconomic performance of territories. Examples are provided by the intense research on social capital (Putnam, 1993), on private (Barro, 1991) and public capital (De Haan and Romp, 2007) and on human capital (Lucas, 1988).

An exhaustive classification of endogenous local assets was recently settled through the concept of territorial capital, firstly introduced by OECD (2001). Territorial capital is defined by the system of a variety of territorial assets having economic, cultural, social and environmental nature (Camagni, 2008). In order to succeed, regions and territories have to exploit the potential of this complex set of locally-based factors. Camagni (2008) provided a taxonomy for these elements, based on their degree of materiality and rivalry. Rather than a simple list of local assets, this approach explicitly defines their properties, allowing to identify potential interactions and policy implication.

The graphical representation of territorial capital proposed by Camagni (2008) is reported in Figure 1.

**Figure 1.** Territorial capital: a taxonomy

| Rivalry | | | | |
|---|---|---|---|---|
| (high) | *Private goods* | **c**<br>Private fixed capital stock<br>Pecuniary externalities<br>Toll goods | **i**<br>Relational private services operating on:<br>— External linkages for firms<br>— Transfer of R&D results | **f**<br>Human capital<br>Pecuniary externalities |
| ↑ | *Club goods, impure public goods* | **b**<br>Proprietary networks<br>Collective goods:<br>— Landscape<br>— Cultural heritage | **h**<br>Cooperation networks<br>Governance on land and cultural resources | **e**<br>Relational capital |
| (low) | *Public goods* | **a**<br>Resources:<br>— Natural<br>— Cultural (punctual)<br>Social overhead capital:<br>Infrastructure | **g**<br>Agglomeration and district economies<br>Agencies for R&D transcoding<br>Receptivity enhancing tools<br>Connectivity | **d**<br>Social capital:<br>— Institutions<br>— Behavioural modes, values<br>trust, reputation |
| | | *Tangible goods (hard)* | *Mixed goods (hard + soft)* | *Intangible goods* |
| | | **(high)** | **Materiality** → | **(low)** |

*Source:* Camagni (2008).

Recalling what suggested by the European Commission (2005), different kinds of investments are likely to have different returns based on the peculiar territorial capital endowments of each region. EU Cohesion policies, a program of regional public investments in a set of diversified fields (from R&D to transport infrastructure, from SME to social inclusion) is perfectly suited for testing this assumption.

## 2.2. Cohesion policies (2000-2006): instruments and actions

In the period 2000-2006 the EU budget for the communitarian regional policies was about 213 billion euro. These funds were managed by three main instruments, the two Structural Funds and the Cohesion Fund. As far as the former are concerned, the European Regional Development Fund (ERDF) mainly contributed to assisting those regions whose development is lagging behind and those undergoing economic conversion or experiencing structural difficulties. The European Social Fund (ESF), on the other hand, mainly provided assistance under the EU employment strategy[3].

[3] Apart from these two instruments, two other funds under the CAP involved regional development issues, even if to a more limited extent, namely the EuropeanAgriculturalGuidance and Guarantee Fund (EAGF) and the Financial Instrument for Fisheries Guidance (FIFG).

The Cohesion Fund (CF) co-financed actions in the fields of the environment and transport infrastructure of common interest with a view to promoting economic and social cohesion and solidarity between member states. Eligibility was restricted to member states whose per capita gross national product (GNP) is less than 90% of the Community average.

The budget devoted to these funds (approximately one third of the overall EU budget) finances different types of actions and initiatives. Between 2000 and 2006 these programmes of intervention were classified into objectives and initiatives. The largest share of the resources (182.5 billion Euro) were aimed at pursuing the three communitarian objectives. Objective 1, devoted to regions with a per capita gross domestic product (GDP) lower than 75% of the community average, covered about the 69.1% of the total allocations and was financed by the ERDF and by the ESF. These funds financed also the Objective 2, covering about 11.5% of the total allocations. Finally, Objective 3 was financed by the ESF and covered about 12.5% of the funds.

A lower budget (10 billion euro) was available for supporting four initiatives[4].

The data set employed in the present paper covers ERDF and CF commitments in NUTS3 EU regions. Table 1 shows the amount of commitments in CEE countries between 2004 and 2006. It is worth noting that, beyond the classification of actions into objectives and initiatives, EU funds are allocated to a variety of policies and interventions, from the support to private firms to actions for enlarging women participation in the labour market, to the building of transport infrastructure. All these axes of expenditure are classified, in Table 1, into four categories, according to the disaggregation reported in Appendix A.

The largest share of funds (85%) was allocated to the realization of basic infrastructure, followed by programmes aimed at supporting the productive environment (15%). Being almost all CEE regions eligible for the Objective 1 actions, the vast majority of commitments fell in this category (43 per cent) and under the CF (53 per cent).

[4] The Interreg III initiative (financed through the ERDF) was aimed at stimulating cross-border, transnational and inter-regional cooperation. Leader+ initiative (EAGGF) promoted rural development. Equal and Urban II initiatives were respectively focused on the reduction of any form of discrimination and inequality in access to the labour market (ESF) and to the promotion of the socio-economic regeneration of declining towns and cities (ERDF).A last family of interventions concerns the innovative measures aimed at promoting new strategies for development. About the 0.65% of the Cohesion policy budget was devoted to the promotion of such activities.

**Table 1.** ERDF and CF expenditure commitments in CEE regions, 2004-2006.

| | *Productive Environment* | *Human Resources* | *Basic Infrastructure* | *Other* | *Total* | *%* |
|---|---|---|---|---|---|---|
| ERDF Objective1 | 2,849 | 182 | 5,749 | 284 | 9,065 | 43% |
| ERDF Objective2 | 49 | 7 | 74 | 4 | 134 | 1% |
| CF | 0 | 0 | 11,028 | 132 | 11,160 | 52% |
| Urban II | 0 | 0 | 0 | 0 | 0 | 0% |
| Interreg III | 287 | 56 | 353 | 50 | 747 | 4% |
| TOTAL | 3,186 | 246 | 17,204 | 471 | 21,106 | 100% |
| *%* | 15% | 1% | 82% | 2% | 100% | |

Millions of Euro.
*Source:* SWECO (2008).

## 2.3. Cohesion policies and economic development: evidence from the literature

A long stream of research focused on the impact of Cohesion policies on economic growth, from both a national and regional perspective. As far as the latter is concerned[5], empirical evidence provides contrasting results.

Analysing the case of Eastern Germany between 1995 and 2004, Eggert *et al.* (2007) found a positive impact of Cohesion policies on regional convergence, but a negative effect on aggregate growth. Dall'erba and Le Gallo (2008) dealt with the case of 145 EU regions between 1989 and 1999. Even if processes of regional convergence took place in that period, the authors found no causal relationships between funds and economic growth. For the same years Esposti and Bussoletti (2008) evaluated the effect of Cohesion policies in Objective1 regions, finding a positive overall impact of regional funds, whose magnitude is however negligible and may become, in some cases, even negative, due to country effects.

The majority of studies, however, suggested a positive impact of Cohesion policies on economic growth (Ramajo *et al.*, 2008; Dall'Erba, 2005).While the above-mentioned studies dealt with the time period pre-2000, some works assessed the wave of funding programmes 2000-2006, the first also including CEE regions. Becker *et al.* (2010) were able to estimate the impact of Objective 1 actions on regional GDP growth in monetary terms. According to their findings, each Euro of transfers leads to 1.20 Euro of additional GDP. Similar evidence occurred, as far as Objective 1 regions

[5] Also country studies on the same issue provided mixed evidence. A negative impact of the Structural Funds Programme on GDP growth was found by Boldrin and Canova (2001), while the opposite holds for the evaluation by Midelfart-Knarvik and Overman (2002). Other scholars (Leonardi, 2006) claimed that the impact of Cohesion policies significantly varied across countries.

are concerned, in the analysis by Mohl and Hagen (2010). More recently Becker *et al.* (2012) suggested that in more than one third of the recipient regions the intensity of funding was above the most efficient level, and they estimated that in 18% of the regions a reduction of transfers would not lead to a slowdown in economic growth.

This divergence in the results of the literature on Cohesion policies reflects the variety of approaches and techniques employed in the studies summarized above[6].In particular, a problematic issue is represented by the classification of the funds. When investigating the relationship between investments and economic growth, almost all works did not distinguish among the axes of expenditure of Cohesion policies. As pointed out by Dall'erba *et al.* (2009) the expected impact of an investment in public infrastructure is likely to be very different to the outcome of policies aimed at the reduction of long-term unemployment. Based on a similar reasoning Rodríguez-Pose and Fratesi (2004) classified EU funds according to the different axes of intervention. Their results showed that only funds directed to education and human capital hada positive and significant impact on economic growth in the period 1989-1999.

The approach adopted in the present paper is similar. Our assumption is that Cohesion policy investments can be classified into two main categories. The first one includes those interventions not principally aimed at fostering economic growth but rather at reaching social and political outcomes. Measures for the reduction of inequalities and for the support of cohesion and sustainability pertain to this group. The second category of investments comprehends all the policies and programmes whose main objective is to promote economic growth and competitiveness. The provision of new infrastructures, R&D incentives, support to large companies and SMEs are examples for such interventions. This classification is needed since the role of territorial capital on the outcome of Cohesion policies is assumed to differ between the two typologies of investments, as discussed in the next section.

## 3. Territorial capital, Cohesion policies and economic growth

### 3.1. The role of territorial capital on the effectiveness of Cohesion policies: ex-ante assumptions

Based on the literature and evidence summarized in the previous section, the research question which will be addressed by the present paper is what is the relationship between territorial capital, Cohesion policies and economic growth. The theoretical assumption to be tested is that cohesion policies and territorial capital concur in fostering economic growth through two different mechanisms, as depicted in Figure 2.

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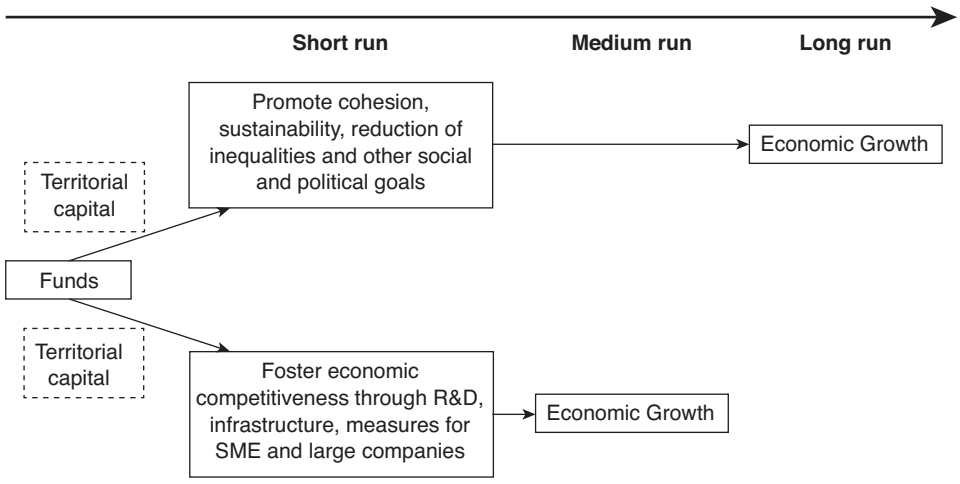
[6] Among other things, the lack of counterfactual evidence represents a concern in such studies (Becker *et al.*, 2010). Reverse causality between eligibility for funds and economic growth was discussed by Bouvet (2005) and Dall'erba and Le Gallo (2008). The issue on the territorialisation of Cohesion policies and their implementation at different institutional levels was examined by Bachtler *et al.* (2013) and Ferry and McMaster (2013).

**Figure 2.** Territorial capital, Cohesion policies and economic growth




In the short run territorial capital is assumed to mediate the impact of the funds (lower side of Figure 2). Following a place-based approach to development strategies (Barca, 2009; OECD, 2009), any policy is implemented in a specific place, defined by peculiar cultural, social, economic characteristics or, in a nutshell, by a distinctive endowment of territorial capital. These territorial conditions are not neutral with respect to the policy outcomes (Pike *et al.*, 2006). Moreover, these local factors are expected to mediate the impact of both categories of policies identified in the previous section.

In the medium and long run, however, Cohesion policies are also aimed at the generation and accumulation of territorial capital, which will be the prerequisite for economic growth in the longer run (upper side of Figure 2). The building of a new highway, for instance, will lead to an increase in the infrastructural endowment of the region (box *a*, Figure 1). Policies supporting women participation in the labour market are likely to produce positive spillovers on the social capital of a given place (box *d*, Figure 1). The enriched endowment of territorial capital, in turn, is expected to promote economic growth (Capello and Perucca, 2014).

These accumulation processes require different amounts of time. Investments in infrastructure, R&D, entrepreneurship are likely to impact economic growth in the short run, while the financing of social inclusion or sustainable development policies are assumed to manifest their results in the long run.

The focus of this paper is on the medium term mechanisms highlighted by the arrows in the lower part of Figure 2. The outcome of the first years of Cohesion policy expenditure (2004-2006) on economic growth in CEE regions is measured on the regional GDP growth between 2006 and 2010. Therefore, among the 20 available axes of expenditure (reported in the Appendix A) we just considered those

belonging to the category of investments directly aimed at fostering economic development.

The purpose of this paper is to investigate the relationship between new territorial capital (i.e. the EU funds invested in each region), the regional endowment at the beginning of the period of implementation of the Cohesion policies (2004) and the economic growth observed in the subsequent years (2006-2010).This research question was not inspected by previous literature, at least as far as Cohesion policies are concerned. Nevertheless, some works addressed this issue in other contexts. Resmini and Casi (2013) focused on the role of territorial capital in enhancing FDI. Their findings show that the impact of FDI is constrained by the regional socio-economic characteristics, in particular by the endowment of intangible elements (boxes d, e, f in Figure 1). In a recent study Dall'erba and Llamosas-Rosas (2013) analysed the relationship between territorial factors and the outcome of federal spending in the USA, pointing out the interaction between public expenditure and local elements such as human capital and entrepreneurship. These findings reinforce the interest towards a similar analysis on Cohesion policies.

To reach this goal the first step consists in the definition of an empirical measurement of territorial capital, based on the theoretical framework discussed in section 2.

### 3.2. Territorial capital: an empirical measurement

The objective to provide an empirical measurement of territorial capital for CEE NUTS3 is constrained by the availability of data at a small spatial level, especially when considering the indicators of the «innovative cross», characterized by intermediate levels of both rivalry and materiality. Nevertheless, the NUTS3 classification is the most relevant when dealing with territorial capital (Camagni, 2008). NUTS2 regions, in fact, are too large for capturing the variety of socio-economic characteristics of places and may include heterogeneous territories within. Moreover, the choice of this smaller territorial scale allows increasing the sample of regions. Starting from the tangible assets, those owing low levels of materiality are proxied by an index of the multimodal accessibility of a given place (Figure 3), whose role in fostering economic growth refers to the size of the regional market potential (Redding and Sturm, 2008). Based on this literature, physical accessibility is expected to reinforce the impact of policies aimed at assisting firms (axes 15 and 16, Appendix A). Keeping other things constant, companies able to reach a broader market are more likely to get a higher return on the investment. On the other hand, assuming a diminishing productivity of transport investments (Banister and Berechman, 2001), we expect the degree of accessibility to be negatively related to the return of the funds spent on basic infrastructures (axes 31-34).

The availability of statistics on impure public goods, such as cultural heritage and monuments, included in box *b* is extremely limited and not fully comparable across countries. For this reason we chose as an empirical measurement for this dimension the per capita number of bed places in tourists accommodation facilities, based on

**Figure 3.** Territorial capital: an empirical measurement for CEE NUTS3 regions

| Rivalry | | | | |
|---|---|---|---|---|
| (high) | *Private goods* | **c** IP addresses | **i** Workforce by ISCO function | **f** Resident population by ISCED educational attainment |
| ↑ (high) | *Club goods, impure public goods* | **b** Bed places in tourists accomodation facilities | **h** | **e** |
| (low) | *Public goods* | **a** Multimodal accessibility Natural capital | **g** Urban/rural typology | **d** Female unemployment rate |
| | | *Tangible goods (hard)* | *Mixed goods (hard + soft)* | *Intangible goods* |
| | | **(high)** | **Materiality** → | **(low)** |

the assumption that the supply of bed places is positively correlated with the attractiveness of each place. This territorial capital element is expected to boost economic growth in regions implementing projects related to tourism (axis 17).

The stock of private capital (box *c*) is captured by the per capita number of computers with active Internet Protocol (IP) addresses. Even if the diffusion of ICT may not be constant across sectors (Becchetti and Adriani, 2005) the number of internet connections is associated to the endowment of private capital in the region. This territorial capital variable has been tested in interaction with the structural fund investments in productive environment (axes 15 and 16) and labor market policies (21-24). However, the potential link between the number of IP addresses and the regional sectoral specialization prevents us from getting significant results.

The proxy for social capital (box *d*) is represented by the gender inequalities measured by the labor market participation of women. The relationship between traditional indicators of social capital, as for instance trust (Fukuyama, 2001), and gender unbalances was discussed in the literature (Rothstein and Stolle, 2003). This component of territorial capital is expected to reinforce the impact of policies focused on the training and inclusion of the labor force (axes 21-25).

Human capital (box *f*) is measured in terms resident population by educational attainment. As pointed out by the long stream of research on this form of capital (Lu-

cas, 1988; Barro, 1991), its impact on economic growth operates through a raise in labor productivity and the adoption of new technologies (Nelson and Phelps, 1966). Following this theoretical background the regions with a higher endowment of human capital are expected to generate higher returns than the others from investments in the productive environment (axes 15-16), labour market (axis 21) and telecommunication infrastructure (axis 32).

**Table 2.** Territorial capital, data and sources

| *Quadrant of Territorial Capital* | *Name of proxy* | *Description* | *Source of data* |
|---|---|---|---|
| **a** | Accessibility | Population potential within 50 km airline distance. | ESPON |
| **b** | Bed places | Per capita bed places in registered tourist accommodation. | EUROSTAT |
| **c** | IP addresses | Number of registered IP addresses. | ESPON |
| **d** | Female unemployment rate | Ratio between female and male unemployment (age over 15). | EUROSTAT |
| **f** | Resident population by ISCED attainment | Share of high educated residents (ISCED 5 and 6) over the total. | EUROSTAT |
| **g** | Urban/rural typology | Urban/ rural settlements. | ESPON |
| **i** | Workforce by ISCO function | Share of professionals and managers over the total. | EUROSTAT |

In the context of this paper agglomeration economies (box g) are considered in terms of the positive externalities induced by the urban environment (Parr, 2002). Based on the literature devote to the role of urbanization economies in fostering economic growth (Rosenthal and Strange, 2004), this component of territorial capital is assumed to be linked to higher GDP growth rate. At the same time, however, their marginal return is expected to decrease as the size of the city increases (Graham, 2007). In other words, investments in basic infrastructures (axes 31-34) are expected to be less effective as the intensity of urbanization economies raises. In the data set employed in the paper the proxy for this territorial asset is represented by a categorical variable identifying environments characterized by different degrees of urbanization (urban/intermediate/rural).

The territorial capital elements characterized by a high degree of rivalry and an intermediate level of materiality (box *i*) are empirically measured by the classification of the regional workforce according to the ISCO functions. With respect to the educational attainment, job functions cannot be considered as pure intangible goods, since they represent skills and competences integrated in a production process. They are assumed to improve the effectiveness of labor market policies (axes 21-25): re-

gional labor markets marked by low-level functions are expected to be less capable than the others to implement inclusive labor policies.

Finally, data at NUTS3 level are unfortunately not available for the components of territorial capital included in boxes *e* and *h*.

## 4. Methodology and general results of structural fund on growth

In order to estimate the impact of territorial capital on structural funds effectiveness a cross section regression model is used. Panel data, in fact, only exist for expenditure at an aggregate level (total amount), which is not relevant in this context. Since on the contrary expenditure at category level is only available for the full programming period 2000-2006, a cross section model is the only available option.

At the basis of the analysis, used as benchmark for the insertion of the other regressors, there is a traditional Barro-like regional growth model, taking the form:

$$ln(GDP_{i,2010}) - ln(GDP_{i,2006}) = lnGDP_i + specialization_i + reg.\_typology_i + \varepsilon_i \qquad (1)$$

where regions *i* are the 108 CEE regions of the sample, and the explained growth rate is the one between 2006 and 2010, i.e. the growth rate in the four years after the policy expenditure has taken place.

Moreover, the regression includes a number of controls, quite standard in the literature, which are inserted in order to avoid an omitted variables bias in the regressions:

- regional specialization (measured by the share of workers employed in the agricultural sector);
- the regional typology (measured by a dummy for those regions in industrial transition industrialization, deindustrialization and structural change, according to ESPON 2010)[7];
- regional per capita GDP at the beginning of the period, included in order to account for the degree of development of the region and all other factors correlated with it;
- finally, country dummies are inserted in order to consider the national factors of regional growth, which are highly relevant since, especially in periods of macroeconomic trouble, the national conditions are determinants of paramount importance, due to aspect such as public finance, de-valuation/re-valuation, the economic regulation setting, the legal system and the likes.

[7] Regions are classified according to the on-going process of industrial restructuring in four categories: regions with manufacturing branches losing importance, regions with manufacturing branches gaining importance, regions with internal (within the same sectors of specialization) industrial structural change, regions with a stable composition of their productive sector (*source:* ESPON, 2010).

This cross section model can be estimated by standard OLS but, since the observations of this model are regions (at Nuts3 level), it is possible that its residuals are spatially autocorrelated and estimates would hence be biased. For this reason, the residuals of the model have been tested for spatial autocorrelations with different typologies of distance matrixes in order to see whether there is the need for a spatial regression model.

The results, presented in Table 3, show that there would be a significant spatial autocorrelation without the national fixed effects. However, once the national fixed effects are inserted in the model, there is no residual spatial autocorrelation, nor if the matrix is a binary neighbour matrix, nor if the matrix is an inverse distance matrix.

Spatial autocorrelation only appears when the distance is the 3rd quantile distance, but this distance is so big that the effect is no longer a spatial effect but actually a global effect.

The conclusion which stems from Table 3 is that the spatial effects are indeed due to the fact that, as supposed, the regional growth rate depends significantly on national growth, and regions are normally closer to regions belonging to the same country.

Finally, it is a possibility that negative spatial autocorrelation emerges once national effects are inserted, due to the fact that some regions are by definition above or below the average of their respective country, but in this case the problem is not present, most likely because Nuts3 regions are small enough that there are many of them inside the same country, so that one of them having a higher growth rate exerts a negligible effect on differential of the others with respect to the country.

**Table 3.** Spatial autocorrelation tests

| *Binary neighbours matrix* | *OLS without country FE* | *OLS with country FE* | | | | |
|---|---|---|---|---|---|---|
| | *Largest minimum distance* | *Largest minimum distance* | *1st quartile distance* | *Median distance* | *3rd quartile distance* | *Smallest maximum distance* |
| **Spatial error** | | | | | | |
| Moran's I | 10.492*** | 0.221 | 0.265 | –0.857 | –0.556 | –0.413 |
| Lagrange multiplier | 86.689*** | 0.999 | 1.538 | 3.294* | 2.646 | 2.42 |
| Robust Lagrange multiplier | 0.148 | 1.332 | 2.482 | 2.231 | 2.904* | 3.199* |
| **Spatial lag** | | | | | | |
| Lagrange multiplier | 100.682*** | 0.134 | 0.013 | 1.121 | 0.543 | 0.425 |
| Robust Lagrange multiplier | 14.142*** | 0.467 | 0.957 | 0.059 | 0.8 | 1.204 |

| *Inverse distance matrix* | *OLS without country FE* | *OLS with country FE* | | | | |
|---|---|---|---|---|---|---|
| | *Largest minimum distance* | *Largest minimum distance* | *1st quartile distance* | *Median distance* | *3rd quartile distance* | *Smallest maximum distance* |
| **Spatial error** | | | | | | |
| Moran's I | 11.023*** | 1.009 | 1.094 | –2.221 | –2.825 | –0.621 |
| Lagrange multiplier | 92.561*** | 0.172 | 0.517 | 2.563 | 1.253 | 0.72 |
| Robust Lagrange multiplier | 0.518 | 0.464 | 1.007 | 0.531 | 0.607 | 1.385 |
| **Spatial lag** | | | | | | |
| Lagrange multiplier | 106.992*** | 0.003 | 0.033 | 3.097 | 4.092** | 3.106* |
| Robust Lagrange multiplier | 14.949*** | 0.295 | 0.524 | 1.064 | 3.446* | 3.770* |

*** significant at 1%, ** significant at 5%, * significant at 10%.

The basic regression model (1st column of Table 4) has a high $R^2$, despite of the fact that not all regressors are significant. Significant regressors include the dummy for structural change regions, which is negative and the country dummies, since national aspects are as expected highly relevant to regional growth. Moreover, the dummy for deindustrialization is borderline significant, with a p-value very close to 0.1.

Although some regressors are unsignificant, the model is robust to the subtraction of some of them, therefore we chose to keep the full specification as the basis for the analysis which will follow.

Finally, also the normality of residuals have to be tested. According to the Shapiro-Wilk W test for normality it is not possible to reject the hypothesis that the residuals are normally distributed.

With this standard model as benchmark, the significance of structural funds expenditure has been tested. The standard model of regression has been added up with the commitment of structural funds as in the following equation (2), which extends equation (1):

$$ln(GDP_{i,2010}) - ln(GDP_{i,2006}) = lnGDP_i + specialization_i + reg.\_typology_i + share\_funds_{i,j} + \varepsilon_i \quad (2)$$

where $j$ (= 1,..,19) represents the two-digit expenditure classification, and the shares of funds include all the actions and programs covered in the database. All other variables have the same notation of equation 1.

**Table 4.** Results of the standard regression model

| *Variables* | *(1)* | *(2)* | *(3)* | *(4)* |
|---|---|---|---|---|
| Per capita GDP | 0.010 | 0.009 | | 0.018 |
| Specialization (agric.) | 0.002 | | –0.002 | 0.013 |
| Industrial transition: | | | | |
| Deindustrialization | –0.028 | –0.030* | –0.031* | |
| Industrialization | –0.017 | –0.018 | –0.020 | |
| Structural change | –0.028* | –0.029* | –0.030* | |
| Country fixed effects | Yes | Yes | Yes | Yes |
| Constant | 0.215* | 0.214* | 0.167*** | 0.223* |
| R-squared | 0.789 | 0.789 | 0.788 | 0.784 |
| Observations | 108 | 108 | 108 | 108 |

Robust standard errors. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

In the regressions, the share of expenditure in each axis is included rather than the total amount (or the amount per capita). This is a methodological choice due to the following reasons:

— First of all, the amount of funds in each axis in the database is highly correlated with total funds, since normally those regions having more funds tended to spend more in all axes. Therefore, the commitment in each axis is correlated with GDP, which means that the commitments per capita are not uncorrelated with the variable which defines the eligibility for the policy.
— Second, the amount of funds in various axes are positively correlated among themselves (also because regions receiving more funds are likely to spend more in all axes);
— Finally, all regions but a few ones were Convergence Regions, hence they all are treated regions, which means that all of them were eligible for the same expenditure axes and there are no regions uneligible to some of them.

The results, shown in Table 5 show that apparently the impact of the single commitments on regional growth are not as positive and significant as one would hope.

Table 5 shows the synthesis results of 19 regressions where each time one of the structural funds axes is included along the regressors of the standard model. Only the coefficients for the structural funds axes are shown in the table, and many of them are insignificant, and some are even negative and significant.

These results are not surprising, since they reflect the lack of evidence in the literature about a stable relationship between EU funds and regional growth. As discussed in the previous sections, this is probably due to two reasons. First of all some of the axes of intervention, as for instance planning and rehabilitation policies or the

**Table 5.** Estimation results for the individual axes of commitments

| *Commitment categories* | *Coefficient* |
|---|---|
| 1. PRODUCTIVE ENVIRONMENT | |
| 11 Agriculture | –0.031 |
| 12 Forestry | –0.106*** |
| 13 Promoting the adaptation and the development of rural areas | –0.006** |
| 14 Fisheries | –3.491 |
| 15 Assisting large business organisations | –0.002 |
| 16 Assisting SMEs and the craft sector | 0.000 |
| 17 Tourism | –0.003** |
| 18 Research, technological development and innovation (RTDI) | 0.000 |
| 2. HUMAN RESOURCES | |
| 21 Labour market policy | –0.027*** |
| 22 Social inclusion | –0.022*** |
| 23 Educational and vocational training not linked to a specific sector | –0.001 |
| 24 Workforce flexibility, entrepreneurship, innovation, info. and comm. | –0.005 |
| 25 Positive labour market actions for women | –0.186 |
| 3. BASIC INFRASTRUCTURE | |
| 31 Transport infrastructure | 0.000 |
| 32 Telecommunications infrastructure and information society | –0.005*** |
| 33 Energy infrastructures (production, delivery) | –0.001 |
| 34 Environmental infrastructure (including water) | 0.000 |
| 35 Planning and rehabilitation | –0.006*** |
| 36 Social and public health infrastructure | 0.001 |

Note: only shown are the coefficients of the single axes, obtained by estimating 19 regressions where the basic model regressors are included and each time only one of the axes is included.
Robust standard errors. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

interventions focused on forest, are not primarily devoted to the pursue of economic goals. Second, confirming our hypothesis, investments per se are not a guarantee for speeding up economic growth, but they gain effectiveness only in conjunction with some territorial enabling conditions.

To test the hypothesis that the impact of structural funds is mediated by the endowment of territorial capital of the regions, and expenditure per se is not effective if it is not activated by the prerequisite of the region having the relevant territorial

capital assets, territorial capital is added to the previous specification of the model as in the following equation:

$$ln(GDP_{i,2010}) - ln(GDP_{i,2006}) = lnGDP_i + specialization_i + \\ + reg.\_typology_i + share\_funds_{i,j} + X_i + \varepsilon_i \quad (3)$$

where $X_i$ represents the set of territorial capital assets and all other variables retain the same meaning they had before.

Then, the interactions between territorial capital and EU structural funds commitments are added to the model:

$$ln(GDP_{i,2010}) - ln(GDP_{i,2006}) = lnGDP_i + specialization_i + reg.\_typology_i + \\ + share\_funds_{i,j} + X_i \ + (share\_funds_{i,j}) + X_i + \varepsilon_i \quad (4)$$

An analysis including steps 3 and 4 cannot be performed on all 19 axes but only on those expenditure axes for which it theoretically relevant and empirically feasible.

The empirical analysis, presented in the next sub-section will hence focus on a subset of axes, those where:

— There exist a sufficiently appropriate variable of territorial capital which is related to the expenditure item. As it was shown in Section 3, empirical proxies of territorial capital are not always easily available. Moreover, the variable of territorial capital has to be clearly related to the policy axis, at least theoretically, and there are policy axes for which none of the proxies outlined in Section 3 are relevant.

— Expenditure is intended or expected to impact on economic growth and not only socio-territorial assets. As known, and shown in Figure 2, not all structural fund expenditure is due to impact on regional growth, while some axes are more devoted to improvements in the quality of life and wellbeing of people living in the region rather than direct economic output (e.g. sewage systems, assistance to disadvantaged categories, etc.)

## 5. The effect of territorial capital on the impact on structural fund expenditure

This section will show how the impact of some structural fund expenditure axes is bound to have a different impact depending on the regional endowment of territorial capital, with the methodological steps illustrated in Section 4.

A first example is shown in Table 6a, where analysed is the case of axis 21, «labour market policy», which normally involves measures of training of employed and unemployed workers. The regressions for the different axes reported in the table include the standard regressions variables included in model (1), whose level of significance is not affected by the inclusion of the territorial capital and regional policy variables.

**Table 6.** Estimation results for the expenditure axes

| **a] Cat. 21: Labour market policy** | | | | |
|---|---|---|---|---|
| *Variables* | *(1)* | *(2)* | *(3)* | *(4)* |
| Standard regr. controls | Included | Included | Included | Included |
| Funds cat. 21 | –0.023*** | | –0.022*** | –0.027*** |
| High-value functions | | 0.084 | 0.028 | 0.026 |
| Funds * high-value funct. | | | | 0.390* |
| Country fixed effects | Included | Included | Included | Included |
| Constant | 0.199* | 0.161 | 0.181 | 0.181 |
| R-squared | 0.796 | 0.790 | 0.796 | 0.798 |
| Observations | 108 | 108 | 108 | 108 |
| **b] Cat. 24: Workforce flexibility, entrepreneurship, innovation, info. and communication** | | | | |
| *Variables* | *(1)* | *(2)* | *(3)* | *(4)* |
| Standard regr. controls | Included | Included | Included | Included |
| Funds cat. 24 | –0.000 | | –0.000 | –0.021* |
| Human capital | | –0.002 | –0.001 | –0.053 |
| Funds * human capital | | | | 0.283*** |
| Country fixed effects | Included | Included | Included | Included |
| Constant | 0.215* | 0.216 | 0.216 | 0.202 |
| R-squared corr. | 0.789 | 0.789 | 0.789 | 0.795 |
| Observations | 108 | 108 | 108 | 108 |
| **c] Cat. 25: Positive labour market actions for women** | | | | |
| *Variables* | *(1)* | *(2)* | *(3)* | *(4)* |
| Standard regr. controls | Included | Included | Included | Included |
| Funds cat. 25 (dummy) | –0.013 | | –0.013 | –0.011 |
| Human capital | | –0.002 | 0.010 | –0.031 |
| Funds * human capital | | | | 0.631* |
| Country fixed effects | Included | Included | Included | Included |
| Constant | 0.217* | 0.216 | 0.213 | 0.216 |
| R-squared | 0.791 | 0.789 | 0.791 | 0.796 |
| Observations | 108 | 108 | 108 | 108 |

| **d] Cat. 17: Tourism** | | | | |
|---|---|---|---|---|
| *Variables* | *(1)* | *(2)* | *(3)* | *(4)* |
| Standard regr. controls | Included | Included | Included | Included |
| Funds cat. 17 | –0.003*** | | –0.002** | –0.004*** |
| Bed places in accom. facil. | | –0.012* | –0.009* | –0.018** |
| Funds * bed places | | | | 0.002*** |
| Country fixed effects | In1cluded | Included | Included | Included |
| Constant | 0.207* | 0.221** | 0.213* | 0.212* |
| R-squared | 0.800 | 0.795 | 0.803 | 0.811 |
| Observations | 108 | 108 | 108 | 108 |
| **e] Cat. 33: Energy infrastructures (production, delivery)** | | | | |
| *Variables* | *(1)* | *(2)* | *(3)* | *(4)* |
| Standard regr. controls | Included | Included | Included | Included |
| Funds cat. 33 | –0.002 | | –0.000 | –0.008 |
| Intermediate urban region | | –0.050** | –0.050** | –0.062** |
| Rural region | | –0.069** | –0.069** | –0.074** |
| Funds * intermediate region | | | | 0.018* |
| Funds * rural region | | | | 0.008 |
| Country fixed effects | Included | Included | Included | Included |
| Constant | 0.215* | 0.081 | 0.081 | 0.083 |
| R-squared | 0.789 | 0.808 | 0.808 | 0.812 |
| Observations | 108 | 108 | 108 | 108 |
| **f] Cat. 34: Environmental infrastructure (including water)** | | | | |
| *Variables* | *(1)* | *(2)* | *(3)* | *(4)* |
| Standard regr. controls | Included | Included | Included | Included |
| Funds cat. 34 | –0.000 | | –0.000 | –0.000 |
| Intermediate urban region | | –0.050** | –0.050** | –0.058** |
| Rural region | | –0.069** | –0.069** | –0.069** |
| Funds * intermediate region | | | | 0.013* |
| Funds * rural region | | | | 0.001 |
| Country fixed effects | Included | Included | Included | Included |
| Constant | 0.215* | 0.081 | 0.081 | 0.081 |
| R-squared corr. | 0.789 | 0.808 | 0.808 | 0.811 |
| Observations | 108 | 108 | 108 | 108 |

Robust standard errors. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

By just looking at the direct correlation between commitment in this axis and their impact on growth, it appears that having a high share of funds devoted to it is associated with a negative growth rate (column 1 in the table). This is probably due to the fact that regions tend to spend more on this axis if they are plagued by problems in the labour market, and hence tend to be weaker regions. However, the impact on growth of these funds is not independent on the territorial capital of the region. In this case, one plausible relevant asset of territorial capital are the high value functions (which are private and mixed material-immaterial goods in Figure 3).

Despite of the fact that high value functions per se are unable to induce growth (in column 2 the coefficient is positive but not enough to be significant), they represent a pre-requisite for regional policy related to the labour market to function. In column 4 of the table, one can see that a high share of funds for labour market policies is negative per se but positive if related to high value functions. It is hence possible to conclude that labour market policies are more effective in those regions which are specialized in high value functions, i.e. are regions whose production system is performing higher value tasks which therefore need a more specialized labour force.

Table 6b presents are the results for commitment axis 24, «workforce flexibility, entrepreneurship, innovation, information and communication». In this case, there is no significant impact of the share of funds devoted to this axis on regional growth (column 1). Measures related to this axis are expected to impact on the innovativeness of firms, and on the likelihood to help entrepreneurs successfully building new firms in the region. The territorial capital pre-requisite for these measures to function is human capital, since the possibility to hire workers with better skills should improve the success rate of new entrepreneurial initiatives and also help improve the possibility for existing firms to introduce new innovations. Human capital is an intangible and private element of territorial capital.

In this case, also the territorial capital variable per se does not have a significant impact on regional growth in this case (column 2 of Table 6b) but, as shown by the full model in column 4, it strongly affects the possibility of measures in axis 24 to successfully increase the regional growth rate. The negative coefficient for the pure commitment variable remains negative as in Table 5.

It hence appears that investing in Workforce flexibility, entrepreneurship, innovation, information and communication is a good way to increase the growth rate in those regions which are well endowed with human capital, whereas for those regions where human capital is not present, this development strategy is ineffective if not detrimental.

A result similar to the previous one is obtained for the commitment axis 25 «positive labour market actions for women» (Table 6c). This axis involves measures able to increase the involvement of women in the labour market, which appears not to be having a significant impact on regional growth. However, also in this case, the presence of human capital appears to be a territorial capital pre-requisite for the impact of the policy of regional growth, and this type of policy brings positive effects when

crossed with the endowment of human capital. Regions more endowed with human capital, in fact, are normally more able to take advantage of the inclusion of women, while regions with lower human capital are unable to benefit from what women can bring to the labour force.

The analysis can move out of labour market related issues towards more traditional support to specific sectors. In Table 6d the impact of tourism commitments is analysed and one can see that, as already seen in Table 5, the coefficient of the impact of tourism expenditure is negative. This can take place, more than from the ineffectiveness of the policy itself, from the fact that tourism suffered the economic crisis more than other sectors (the estimation sample is 2006-2010) and therefore regions that have invested more in this sector are those specialized in a difficult sector.

Also in this case, however, the endowment of territorial capital manages to mediate the impact of the policy. In this case, the relevant territorial capital variable is a hard good, whose rivalry is partial (since it can be used by many and crowding out only takes place after a certain threshold), i.e. the endowment of bedplaces.

From Table 6d it is evident that the endowment of bedplaces, signalling a specialization in tourism, is by itself negatively correlated to growth. However, those regions which hold a larger number of bedplaces per inhabitant are more able to take advantage from structural funds investments in the touristic sector. One can in fact expect that any policy improving the touristic attractiveness of regions is more effective when these regions already hold the facilities to accommodate increasing touristic flows.

The last two axes which are analysed in this paper are hard ones which involve the building of basic infrastructure for the regions.

As far as energy infrastructures are concerned, the regressions (Table 6e) show that this commitment axis does not have an impact per se on the regional performance of CEE regions. However, the regional settlement typology of regions is very important in this case: first, it is evident that intermediate urban regions and rural regions have a disadvantage with respect to the mostly urban regions. It is a known fact that urban regions led the development of these countries before and after they joined the EU (Capello and Perucca, 2014).

The settlement structure is a measure of agglomeration and economies and congestion diseconomies, it is hence a mixed (hard+soft) public good in the territorial capital classification.

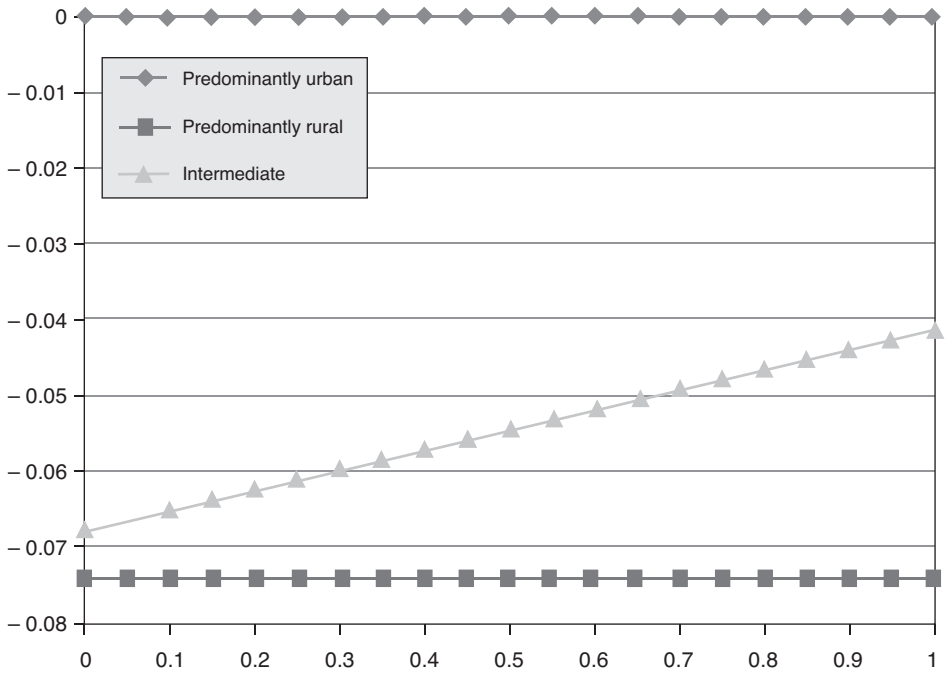
Table 6e shows that, although agglomeration economies are still important in CEE countries and no significant decreasing returns appear, as signalled by the higher growth rate of the urban areas, intermediate regions, those where agglomeration economies are present but farer from reaching the congestion threshold, are those more able to take advantage of investments in energy infrastructure. Urban areas, in fact, already have a relatively good delivery infrastructure, while firms in rural areas do not have enough agglomeration economies to benefit from improvements in energy delivery.

The final commitment axis presented in the paper is axis 34, Environmental infrastructure, whose impact also depends on the degree of agglomeration economies (Table 6f).

As in the previous case, the axis per se is insignificant, but its impact becomes significant when a region is an intermediate urban one. These regions, in fact, benefit from the improved presence of water, sewage and other environmental infrastructure which allow them to grow and expand their agglomeration economies without paying costs in terms of pollution and lower quality of life. Rural areas, on the contrary, most likely hold enough environmental capital that investment in that axis is not able to change the situation.

By drawing the impact of the coefficients of model (4) of Table 6f, one can see that predominantly rural regions are ceteris paribus growing less than their predominantly urban counterparts. At the same time, also intermediate urban regions are growing less, even if less markedly, and, more important, the impact of the policy in these regions is clearly felt. The more the policy invests in environmental infrastructure, the lower becomes the gap between their growth rate and the one of the predominantly urban regions, which however remain more dynamic.

**Figure 4.** Impact of environmental infrastructure policy on the growth rate of the three typologies of regions



## 6. Conclusions

This paper, with an empirical analysis on CEE Nuts3 regions, has shown that regional policy is not so much effective per se but its impact depends on the type and amount of territorial capital possessed by the region. Regions more endowed with territorial capital appear to be more able to take advantage from the policy support of structural funds.

Moreover, territorial capital is differentiated in terms of materiality and rivalry, and the analysis has shown that different policy axes are facilitated by different endowments of territorial capital.

Structural Funds, therefore, work well as economic growth activators when they complement with the regional endowment of territorial capital. Each expenditure axis is hence more fruitful in a different type of region.

In CEE regions[8], the economic impact of EU policy investments in immaterial assets appear to be characterized by increasing returns: they tend to be more effective where regions are more endowed, for example:

- labour market policies are only effective when there is in the region a presence of high value functions;
- workforce flexibility, entrepreneurship, innovation, information and telecommunication policies are only effective when the region is endowed with human capital, while their impact in regions not endowed is not positive;
- also positive labour market actions for women policies work only when the regions hold a good level of human capital.

Increasing returns also exist in some cases of harder policy investments. For example, tourism policies are more effective when regions have the possibility to host the increased flows of people in their structures.

Finally, it also appears that agglomeration economies play a role in some infrastructural policies. As in the CEE countries development has been concentric for a long time, urban regions have an advantage, but the intermediate regions, having the possibility of exploiting an increased degree of agglomeration without incurring in congestion costs, are those that can take advantage of Structural Fund policies in both energy and environmental infrastructure.

It hence looks like there are some decreasing returns emerging, since it is not the largest urban areas that take advantage from these investments but the intermediate ones.

Rural areas, however, also don't take advantage of these hard investments, which questions the whole role of Structural Funds since these regions tend to be the poorest and less developed ones.

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[8] These results have been obtained in the specific case of transition countries, but we are confident that the relationship between territorial capital and the effectiveness of regional policy will hold also for the EU15 regions, although it is possible that, in a different socio-economic context, this relationship might be stronger for some axes and weaker for some others.

If structural funds are more effective when there is territorial capital, it means that investing policy funds in regions already more developed pays more than investing them in weaker regions. It looks like a trade-off is emerging between the effectiveness of policies and the degree of spatial equity they can achieve, which is something very likely when agglomeration economies are strong (Fratesi, 2008), which is probably the case in CEE countries where there is still the possibility of further agglomeration before congestion diseconomies become too large.

One way to sort out of this potential policy dilemma lies in the fact that, as shown in Figure 2, Structural Funds can be devoted to enhancing the competitiveness of regions and hence create growth in the short-medium term, but can also be used as enhancers of territorial capital in the medium-long run. This enriched endowment of territorial capital will eventually enhance the long run growth of the poorest regions.

Where territorial capital is not present, therefore, structural funds could and should be used to enhance territorial capital in the region. This is a long run strategy, which does not produce growth in the short run but should put the bases for growth in the longer run.

## Bibliography

Bachtler, J., Mendez, C., and Oraze, H. (2013): «From Conditionality to Europeanization in Central and Eastern Europe: Administrative Performance and Capacity in Cohesion Policy», *European Planning Studies, forthcoming,* DOI: 10.1080/09654313.2013.772744.

Banister, D., and Berechman, Y. (2001): «Transport investment and the promotion of economic growth», *Journal of transport geography,* 9, 3, 209-218.

Barca, F. (2009): «An Agenda for A Reformed Cohesion Policy: A Place-Based Approach to Meeting European Union Challenges and Expectations», *Independent Report, Prepared at the Request of the European Commissioner for Regional Policy, DanutaHübner, European Commission, Brussels.*

Barro, R. J. (1991): «Economic growth in a cross-section of countries», *Quarterly Journal of Economics,* 106, 2, 407-443.

Becchetti, L., and Adriani, F. (2005): «Does the digital divide matter? The role of information and communication technology in cross-country level and growth estimates», *Economics of Innovation and New Technology,* 14, 6, 435-453.

Becker, S. O.; Egger, P. H., and Von Ehrlich, M. (2010): «Going NUTS: The effect of EU Structural Funds on regional performance», *Journal of Public Economics,* 94, 9, 578-590.

Becker, S. O.; Egger, P. H., and von Ehrlich, M. (2012): «Too much of a good thing? On the growth effects of the EU's regional policy», *European Economic Review,* 56, 4, 648-668.

Boldrin, M., and Canova, F. (2001): «Inequality and convergence in Europe's regions: reconsidering European regional policies», *Economic Policies,* 16, 32, 205-253.

Bouvet, F. (2005): «European Union regional policy: allocation determinants and effects on regional economic growth», *Working Paper,* Department of Economics, University of California, Davis.

Camagni, R. (2008): «Regional Competitiveness: Towards a Concept of territorial capital», in Capello, R.; Camagni, R.; Chizzolini, B., and Fratesi, U. (eds.), *Modelling Regional Sce-*

*narios for the Enlarged Europe: European Competitiveness and Global Strategies,* 33-48, Berlin, Springer Verlag.

Capello, R., and Perucca, G. (2014): «Openness to Globalization and Regional Growth Patterns in CEE Countries: From the EU Accession to the Economic Crisis», *Journal of Common Market Studies*, forthcoming, DOI: 10.1111/jcms.12157.

Dall'erba, S. (2005): «Distribution of regional income and regional funds in Europe 1989-1999: an exploratory spatial data analysis», *The Annals of Regional Science,* 39, 1, 121-148.

Dall'erba, S.; Guillain, R., and Le Gallo, J. (2009): «Impact of Structural Funds on Regional Growth: How to Reconsider a 9 Year-old Black Box», *Région et Développement,* 30, 77-100.

Dall'erba, S., and Le Gallo, J. (2008): «Regional convergence and the impact of European structural funds 1989-1999: A spatial econometric analysis», *Papers in Regional Science,* 87, 2, 219-244.

Dall'erba, S., and Llamosas-Rosas, I. (2013): «Does Federal Expenditure Promote Growth in the Recipient Countries?», P*aper Presented to the NARSC Conference2013,* Atlanta, November 13-16.

De Haan, J., and Romp, W. (2007): «Public capital and economic growth: A critical survey», *Perspektiven der Wirtschaftspolitik,* 8, 1, 6-52.

Eggert, W.; von Ehrlich, M.; Fenge, R., and König, G. (2007): «Konvergenz- und Wachstumseffekte der europäischen Regionalpolitik in Deutschland», *Perspektiven der Wirtschaftspolitik,* 8, 2, 130-146.

ESPON (2010): *projectTC, Typology Compilation, Final Report. The Luxembourg. Available from: http://www.espon.eu/main/Menu_Projects/Menu_ScientificPlatform/typologycompilation.html.*

Esposti, R., and Bussoletti, S. (2008): «Impact of Objective 1 funds on regional growth convergence in the European Union: a panel-data approach», *Regional Studies,* 42, 2, 159-173.

European Commission (2005): *Territorial state and perspectives of the European Union, Scoping document and summary of political messages,* Brussels, May.

Ferry, M., and McMaster, I. (2013): «Cohesion policy and the evolution of regional policy in Central and Eastern Europe», *Europe-Asia Studies,* 65, 8, 1502-1528.

Fratesi, U. (2008): «Regional policy from a supra-regional perspective», *The Annals of Regional Science,* 42, 3, 681-703.

Fukuyama, F. (2001): «Social capital, civil society and development», *Third World Quarterly,* 22, 1, 7-20.

Graham, D. J. (2007): «Agglomeration, productivity and transport investment», *Journal of Transport Economics and Policy,* 41, 3, 317-343.

Leonardi, R. (2006): «Cohesion in the European Union», *Regional Studies,* 40, 2, 155-166.

Lucas, R. (1988): «On the mechanics of economic development», *Journal of Monetary Economics,* 22, 1, 3-42.

Midelfart-Knarvik, K. H., and Overman, H. G. (2002): «Delocation and European integration —is structural spending justified?», *Economic Policy,* 17, 35, 321-359.

Mohl, P., and Hagen, T. (2010): «Do EU structural funds promote regional growth? New evidence from various panel data approaches», *Regional Science and Urban Economics,* 40, 5, 353-365.

Nelson, R. R., and Phelps, E. S. (1966): «Investment in humans, technological diffusion, and economic growth», *The American Economic Review,* 56, 1-2, 69-75.

OECD (2001): *OECD Territorial Outlook,* Paris.

OECD (2009): *How Regions Grow,* Paris.

Parr, J. B. (2002): «Agglomeration economies: ambiguities and confusions», *Environment and Planning A,* 34, 4, 717-732.

Pike, A.; Rodríguez-Pose, A., and Tomaney, J. (2006): *Local and Regional Development,* London, Routledge.

Putnam, R. D. (1993): «Making Democracy Work. Civic Traditions in Modem Italy»,, Princeton, NJ, Princeton University Press.

Ramajo, J.; Márquez, M. A.; Hewings, G. J. D., and Salinas, M. M. (2008): «Spatial heterogeneity and interregional spillovers in the European Union: Do cohesion policies encourage convergence across regions?», *European Economic Review,* 52, 3, 551-567.

Redding, S. J., and Sturm, D. M. (2008): «The Costs of Remoteness: Evidence from German Division and Reunification», *American Economic Review,* 98, 5, 1766-1797.

Resmini, L., and Casi, L. (2013): «FDI and growth in Europe: the role of territorial capital», *ERSA conference papers.*

Rodríguez-Pose, A., and Fratesi, U. (2004): «Between development and social policies: the impact of European Structural Funds in Objective 1 regions», *Regional Studies,* 38, 1, 97-113.

Rosenthal, S. S., and Strange, W. C. (2004): «Evidence on the nature and sources of agglomeration economies», *Handbook of regional and urban economics,* 4, 2119-2171.

Rothstein, B., and Stolle, D. (2003): «Introduction: social capital in Scandinavia», *Scandinavian Political Studies,* 26, 1, 1-26.

Sweco (2008): Final Report - ERDF and CF Regional Expenditure, European Commission, Contract No 2007.CE.16.0.AT.036.

## Appendix A. Regional EU policy in CEE regions: classification of expenditure categories

| *Expenditure categories* | *Expenditure axes* | *Per capita funds in axis* | | | | *Share of funds in axis* | |
|---|---|---|---|---|---|---|---|
| **1.** PRODUCTIVE ENVIRONMENT | **11.** Agriculture | *Mean* | *Std. Dev.* | *Min* | *Max* | *Mean* | *Std. Dev.* |
| | **12.** Forestry | 0.04 | 0.11 | 0 | 0.43 | 0.02 | 0.06 |
| | **13.** Promoting the adaptation and the development of rural areas | 0,15 | 0.37 | 0 | 3.38 | 0.07 | 0.15 |
| | **14.** Fisheries | 219 | 5.84 | 0 | 51.9 | 0.74 | 1.72 |
| | **15.** Assisting large business organisations | 0 | 0.01 | 0 | 0.02 | 0 | 0 |
| | **16.** Assisting SMEs and the craft sector | 3.85 | 7.47 | 0 | 62.38 | 1.37 | 1.92 |
| | **17.** Tourism | 21.58 | 16.7 | 0.89 | 122.61 | 8.75 | 6.59 |
| | **18.** Research, technological development and innovation (RTDI) | 13.75 | 16.94 | 0 | 90.3 | 4.99 | 6.88 |
| **2.** HUMAN RESOURCES | **21.** Labour market policy | 6.81 | 9.24 | 0 | 47.77 | 2.73 | 5.04 |
| | **22.** Social inclusion | 0.8 | 1.96 | 0 | 11.03 | 0.33 | 0.9 |
| | **23.** Educational and vocational training not linked to a specific sector | 0.79 | 1.9 | 0 | 11.15 | 0.32 | 0.85 |
| | **24.** Workforce flexibility, entrepreneurship, innovation, information and communication | 1.87 | 3.25 | 0 | 20.39 | 0.74 | 1.66 |
| | **25.** Positive labour market actions for women | 0.35 | 1 | 0 | 5.99 | 0.15 | 0.5 |
| **3.** BASIC INFRASTRUCTURE | **31.** Transport infrastructure | 0.03 | 0.05 | 0 | 0.15 | 0.01 | 0.03 |
| | **32.** Telecommunications infrastructure and information society | 132.26 | 171.8 | 0.4 | 1448.94 | 36.32 | 21.46 |
| | **33.** Energy infrastructures (production, delivery) | 6.47 | 7.09 | 0 | 54.01 | 2.95 | 3.82 |
| | **34.** Environmental infrastructure (including water) | 3.26 | 5.59 | 0 | 29.82 | 0.97 | 1.51 |
| | **35.** Planning and rehabilitation | 93.2 | 71.02 | 1.49 | 342.83 | 29.86 | 17.2 |
| | **36.** Social and public health infrastructure | 7.43 | 6.63 | 0 | 35.99 | 3.24 | 3.1 |
| **4.** OTHER | **41.** Technical assistance and innovative actions | 12.27 | 16.93 | 0 | 90.57 | 3.94 | 4.36 |
| | **TOTAL** | **313.99** | **206.85** | **75.6** | **1685.26** | **100** | |