

# **Unbalanced development strategies and the lack of regional convergence in the EU**

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## **Unbalanced development strategies and the lack of regional convergence in the EU**

**Abstract:** European regional support has grown in parallel with European integration. The funds targeted at achieving greater economic and social cohesion and reducing disparities within the European Union (EU) have more than doubled in relative terms since the end of the 1980s, making development policies the second most important policy area in the EU. The majority of the development funds have been earmarked for Objective 1 regions, i.e. regions whose GDP per capita is below the 75% threshold of the EU average. However, the European development policies have come under increasing criticism based on two facts: the lack of upward mobility of assisted regions and the absence of regional convergence. This paper assesses, using cross-sectional and panel data analyses, the failure so far of European development policies to deliver greater economic and social cohesion by examining how European Structural Fund support is allocated among different development axes in Objective 1 regions. We find that, despite the concentration of development funds on infrastructure and, to a lesser extent, on business support, the returns to commitments on these axes are not significant. Support to agriculture has short-term positive effects on growth, but these wane quickly, and only investment in education and human capital – which only represents about one eighth of the total commitments – has medium-term positive and significant returns.

**Keywords:** Development policy, Structural Funds, convergence, cohesion, Objective 1, European Union.

## **Introduction**

Since the mid-1980s the importance of EU development policies<sup>1</sup> has not ceased to increase, both in legal and budgetary terms. In legal terms, the question of achieving ‘Economic and Social Cohesion’ in Europe was upgraded from being just a mention in the Preamble of the Treaty of Rome to becoming Title XIV (currently Title XVII) after the passing of the Single European Act. In budgetary terms, development policies have grown from representing a mere 10% of the European Communities budget and 0.09% of the EU-15 GDP in 1980 to more than one third of the budget and around 0.37% of the EU GDP, as an average of the period 1998-2001. Development policies have become, after the Common Agricultural Policy (CAP), the second largest policy area in the EU.

The increasing importance and visibility of EU development policies is related to the political view that European integration was and is likely to unleash centripetal economic forces and therefore to bring greater benefits to the European core, increasing the gap between the core and the periphery to socially and politically unacceptable levels. In accordance with this political belief, every recent step towards greater economic integration has been accompanied by measures aimed at preparing the lagging countries and regions of the EU to cope with the challenges ahead. First, the establishment of the Single Market was preceded by the 1989 reform of the

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<sup>1</sup> We use the term development policies as a general term that includes all the Structural Funds – ERDF, EAGGF Guidance Section, ESF, and FIFG – as well as the Cohesion Fund.

Structural Funds<sup>2</sup>. The reform implied not just the co-ordination of the then three Structural Funds and a comprehensive restructuring of the principles that guided their action, but also the doubling in relative terms of the monies committed to regional development, from 15.1% of the European budget in 1988 to 30.2 in 1992. Second, the decision in the Maastricht reform to create the Single European Currency was tied in with the establishment of the Cohesion Fund in order to alleviate the burdens that transition to EMU would impose on the less developed member states of the EU (Greece, Ireland, Portugal, and Spain). This fund represented in 2001 2.6% of the EU budget.

After the reform more than two thirds of all Structural Fund expenditure is concentrated in the so-called Objective 1 regions, that is, the regions whose GDP per capita measured in purchasing power standards (pps) is less than 75% of the EU average. The concentration of the Structural Funds and the Cohesion Funds in the less privileged areas of the Community has meant that European development support throughout the 1990s has hovered around 3.5% of GDP in Portugal, between 2.5 and 3.5% in Greece and Ireland, and between 2 and 3% in Italian and Spanish Objective 1 regions (European Commission, 2000a: 213; Cuadrado-Roura, 2001).

Yet, despite their rising macroeconomic importance, questions are being raised about the capacity of European development policies, in general, and of policies targeted at

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<sup>2</sup> The European Structural Funds are the European Regional Development Fund (ERDF), the European Agricultural Guidance and Guarantee Fund (EAGGF), Guidance Section, and the European Social Fund (ESF). In 1994 the FIFG (Financial Instrument for Fisheries Guidance) was added to the Structural Funds.

Objective 1 regions, in particular, to deliver greater economic and social cohesion and to reduce the gap between the centre and the periphery of the EU. These questions are fundamentally based on two facts. First is that thirteen years after the implementation of the reform of the Structural Funds, the majority of the original Objective 1 regions remain in the Objective. Second is the increasing evidence that regional convergence – which was the norm in across Europe until the late 1970s – has come to a halt (Canova and Marcet, 1995; Cheshire and Magrini, 2000).

In this paper we will analyse to what extent are the Structural Funds contributing to raise the GDP per capita of Objective 1 regions, by focusing on the policy axes to which the Structural Funds have been allocated. In order to achieve that, the paper is divided into five further sections. The first section presents the EU development policies and the evolution of Objective 1 since the implementation of the reform of the Structural Funds in 1989. The second section concentrates on the measures of success or failure of development policies in Objective 1 regions between the reform of the Structural Funds and 1999, by looking at the evolution of Objective 1 regions and recent trends in regional disparities. Section three analyses the overall impact of Structural Fund expenditure in Objective 1 regions, while section four highlights the extent to which the unbalanced allocation of funds across four development axes (infrastructure, business support, agriculture and rural support, and human capital) may be undermining the capacity of Structural policies to reduce the gap between the core and the periphery of the EU. Section five concludes.

## **1. European Development Policies in Objective 1 regions**

The decision to implement the Single European Market represented a boost for European regional development policies. The political belief that European economic integration was likely to foster the development of core regions at the expense of the periphery (Padoa-Schioppa, 1987; Emerson, 1990; European Commission, 1994a) led to the introduction of the principle of ‘Economic and Social Cohesion’ in the Single European Act. This step was reflected in Arts. 158 (formerly 130a) to 162 (formerly 130e) of the Treaty of the European Communities. In these articles, the European Communities gave themselves the task of pursuing “actions leading to the strengthening of social and economic cohesion” (Treaty of the EU, art. 158, paragraph 1), with special emphasis on “reducing disparities between the levels of development of the various regions and the backwardness of the least favoured regions or islands, including rural areas” (Treaty of the EU, art. 158, paragraph 2).

In order to achieve this greater economic and social cohesion<sup>3</sup>, a radical reform of regional development policies was implemented on the 1<sup>st</sup> of January 1989. This reform implied the coordination of all existing structural funds (ERDF, ESF, and EAGGF-Guidance Section) under the principles of territorial and financial concentration, programming, partnership, and additionality<sup>3</sup>. The reform was accompanied by a doubling of the regional development funds in the space of four years: from 15.1% of the European budget and 0.16% of the European GDP in 1988 to 30.2 and 0.33% respectively in 1993 (Table 1.1). Although since 1993 the relative size of the Structural Funds has increased at a much slower pace and its relative size is

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<sup>3</sup> A fifth principle of efficiency was later introduced.

due to decline until 2006 (European Commission, 2001), the monies available for development have continued to grow in absolute terms. The European expenditure in development policies – including the Cohesion fund – was a mere 27.4€ per capita in 1988, increasing to 69.2€ in 1993 and 83.4€ in 2001 (measured in 2000 prices) (Table 1.1 and Table A1 in Appendix).

**Insert Table 1.1 around here**

Since the reform, the Structural Funds are allocated through the multi-annual planning of assistance. For Objective 1 regions, five to seven year Community Support Frameworks (CSFs), which are supplemented by Operations Programmes (Ops), are approved by the Commission in consultation with the relevant member state – and, whenever relevant, with the involvement of regional tiers of government in the process – on the basis of regional development plans previously submitted by the nation-states. Two programming periods have been already completed (1989-93 and 1994-9) and a third one (2000-6) is underway.

The largest percentage of Structural funds is spent, following the principle of territorial concentration, in promoting the development and structural adjustment of Objective 1 regions, that is the regions whose development is lagging behind. Despite successive restructurings of the Structural Funds since 1989, the operating criterion to qualify for Objective 1 has remained unchanged: to have a GDP per capita, measured in purchasing power parities and calculated on the basis of Community figures for the last three years available, of less than 75% of the Community average (cfr. Council Regulation 1260/99, art. 3). Only the inclusion after 2000 of the former Objective 6

regions – for the development and structural adjustment of regions with an extremely low population density in Sweden and Finland – in Objective 1 entails a deviation from this criterion.

The number of Objective 1 regions has grown with every programming period. In 1989 forty-four regions qualified as Objective 1. This group included the whole of Greece, Ireland, and Portugal, the south of Italy and most regions in southern and western Spain, plus Northern Ireland, Corsica and the French overseas Departments and Territories. German reunification brought the five Länder of the former GDR and East Berlin into the Objective. New regions in Belgium, France, the Netherlands, Spain, and the UK became eligible in 1994 for the second planning period and Burgenland after Austrian membership. For the programming period 2000-6 and after the inclusion of the former Objective 6 into Objective 1, sixty-seven regions qualify as Objective 1, eleven of which will be phased out by the end of the programming period (see Figure 2.1).

As a whole, Objective 1 regions receive more than two-thirds of the total Structural Fund expenditure. 68.7% of the expenditure in the programming period 1989-1993 (European Commission, 1994b); 67.9% between 1994 and 1999 (European Commission, 2000b); and 69.7% for the period 2000-06 (cf. European Council Regulation 1260/99, art. 7).

Structural funds in Objective 1 regions are allocated both to regional specific operation plans and to multiregional national plans that cover several regions. As a whole, EU development aid represents a considerable percentage of the GDP of

Objective 1 regions. According to our data (see Annex 1), between 1989 and 1999 the commitments of the Structural Funds amounted on average to 1.74% of the GDP of Objective 1 regions. 0.90% was allocated to regional commitments and an average of 0.84% went to multiregional commitments<sup>4</sup>. There are however considerable geographical and chronological variations in the allocation of funds. From a geographical perspective, whereas in the better off Objective 1 regions, such as Abruzzo or Apulia in Italy, Northern Ireland in the UK, Corsica in France, Hainaut in Belgium, or Flevoland in the Netherlands, the Structural Fund support has remained below the 1% of GDP threshold, in poorer areas regional support has been much higher. In the ultraperipheral Portuguese archipelagos of the Azores and Madeira, Structural Fund support has exceeded in certain years 5% of GDP. In Alentejo in Portugal, in Extremadura in Spain, and in some Greek regions Structural Fund commitments have been at periods in excess of 3% of GDP. From a chronological perspective, the variation is also significant. Let us take three regions as an example. In Basilicata, in Italy, the Structural Funds commitments have ranged from less than 0.7% of GDP in 1991 to slightly more than 3% in 1997, with jumps of more than 1% of GDP in the years 1992-3, 1993-4, and 1996-7. In the Spanish region of Extremadura, the gap between the year with the highest level of relative support (1999) and that with the lowest (1989) represents 4% of GDP, and in the French region of Corsica the relative level of support in 1995 was eight times lower than in 1989. Basilicata, Extremadura, and Corsica seem to be the rule rather than the exception, as considerable variations in Structural Fund commitments from one year to another are evident in almost all Objective 1 regions.

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<sup>4</sup> Not all countries – starting by those that have only one Objective 1 region – have multiregional commitments.

European development support for Objective 1 regions does not end with the Structural Funds. A large number of these regions also benefit from Community Initiatives and from a certain percentage of the non-regional Cohesion Fund.

Successive CSFs and Ops have established the priorities for intervention in Objective 1 regions. These priorities vary across regions and adopt a host of different names and labels in different CSFs, with wide variation even across regions in the same country. The range of names used vary from the strait forward (transport, tourism, fisheries, or human resource development) to the vague ('Development of regional potential' or local development or potential) and the mysterious (optimisation of geographic position in the case of Western Greece). However, after analysing in detail all the CSFs for the first two programming periods (1989-93 and 1994-9), the EU's development support intervention in Objective 1 regions can be classified according to four main axes that closely reflect the priorities described in the First Annual Report on the implementation of the Reform of the Structural Funds (1991), when it was stated that "although support for basic infrastructure remains a major item in these regions, the CSFs as a whole reflect the common determination of the Member States and the Commission to target assistance from the Funds on effort to increase the competitiveness of the economies concerned" (European Commission, 1991: 7).

These four priority axes are:

- a) support to agriculture and rural promotion (A);
- b) business and tourism support (B);
- c) investment in education, re-qualification and all measures targeting the human capital of the region (H);

d) investment in infrastructure, transport, and environment (I).

The volume of expenditure on each of the axes is very uneven. According to our data, for the programming period 1994-9, about half (49.6%) of the Objective 1 Structural Funds were committed to investment in infrastructure, transport, and the environment. Business and tourism support came a distant second with 23.2% of the commitments, followed by investment in education and human capital related issues with 13.3% and support to agriculture and rural promotion with 8%. The remaining 5.9% was committed to areas that are difficult to classify under any of the above categories (see Annex 1 for an explanation on the origin and calculation of data).

Once again, there are huge geographical and chronological differences in the importance of each of the axes. Geographical differences tend to reflect national differences in regional development strategies, whereas chronological differences reproduce changes in those strategies between the two programming periods considered in the analysis. In Portuguese and Spanish CSFs, there has been a strong emphasis on infrastructure, transport, and the environment. During the second programming period, investment in infrastructure represented about 90% of the Objective 1 Structural Fund commitments in Portuguese regions (with the exception of the two archipelagos) and about 70% of the commitments in the Spanish Objective 1 regions (with the exception of the northern African enclaves of Ceuta and Melilla). This denotes an increase from the first programming period, where investment in infrastructure and related areas in both countries was around 50% of the total. The heavy bias towards infrastructure means that the remaining priority axes receive very little support. In the Continental regions of Portugal, during the second programming

period an average of 10% of Objective 1 funds has been targeted to business and tourism support, with almost no money going into education and human capital or into support to agriculture and rural promotion. In the two archipelagos, more emphasis has been put on human capital development, with around 18% of the funds committed to that axis in the Azores and 28% in Madeira. Support to agriculture and rural promotion, that represented slightly more than 10% of the commitments during the first programming periods, almost disappeared from the Portuguese development priorities during the second programming period. In Spanish Objective 1 regions, and in spite of strong regional variations, about 15% of all Structural Fund commitments were earmarked for business and tourism support. Human capital came third and support to agriculture and rural promotion, which was the second priority axis during the first programming period<sup>5</sup>, dropped to fourth place during the second period. Corsica has been another region whose development strategy has been fundamentally based on infrastructure. Around half of the funds committed during the two programming periods were aimed at improving the infrastructural endowment and the environment of the region. Support to agriculture and rural promotion constituted the second priority axis, whereas the remaining funds were equally divided between human capital and business support

In contrast to the strong focus on infrastructure investment in the Iberian peninsula and Corsica, the breakdown of commitments in other Objective 1 regions tends to be substantially different. Two thirds of the Objective 1 funds committed in Hainaut

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<sup>5</sup> Support to agriculture and rural promotion amounted to more than 40% of the Objective 1 commitments in some northern Spanish regions during the first programming period.

(Belgium) and Burgenland (Austria) during the second programming period went to business and tourism support. The remainder was spread fairly evenly between infrastructure and human capital in Hainaut and agricultural support and human capital in Burgenland. In Merseyside (UK), more than half of the funds went to improving education and human capital, a quarter each to business support and infrastructure, and no money to agriculture or rural development.

Greater national heterogeneity in development strategies can be observed across Italian and Greek regions. In Italy, infrastructure was the main development axis during the first programming period in all Objective 1 regions, bar Abruzzo and Basilicata. Business support came a close second, with more than one quarter of all commitments in all Objective 1 regions – with the exception of Molise – and more than 50% in Abruzzo. Support to agriculture was the third main development axis, amounting in most cases to between 15 to 20% of total commitments, while the investment in human capital was the weakest axis, only surpassing 5% in Basilicata. The structure of commitments in Italian regions changed radically and became more heterogeneous during the second programming period. Support to infrastructure suffered a relative decline, to the benefit of human capital support, whose share in the total Objective 1 commitments increased throughout the South of Italy. Commitments to this development axis ranged from 11% of the total in Molise, to 37% in Sicily and 38% in Basilicata. Support for businesses declined in relative terms in all regions, bar Calabria, but remained one of the key development axes. Finally, there was greater divergence in support to agriculture and rural promotion during the second programming period. Whereas in Basilicata or Calabria this axis almost ceased to exist, in other regions – such as Apulia, Sardinia, Sicily, and especially in Molise,

where it became the main development axis – its share in the development strategy grew.

In Greece the allocation of funds has been closely related to the production structure of each region. As in other countries infrastructure was the main development axis, receiving around 50% of Objective 1 funds in both programming periods. However, in the case of Attica this percentage grew to more than 90% in the second programming period, almost coinciding with the selection of Athens as the host of the 2004 Olympic games in 1997. Support to agriculture and rural promotion hovered between 25 and 40% of all commitments in the heavily rural northern and central regions, whereas tourism and business support scored high in the Greek islands and human capital and education attracted between 10 and 20% throughout Greece, with the exceptions of Attica and Crete, where its share was lower.

Finally the greatest balance across development axes is found in the UK regions of Northern Ireland and the Highlands and Islands, and in Flevoland (Netherlands). In Northern Ireland business support represented the main development axis during the first programming period and was substituted by infrastructure, transport and the environment in the second period. However the gap between these two axes and human capital support has been relatively small. Agricultural support and rural development also drew more than 10% of Objective 1 commitments during the two planning periods. In the Highlands and Islands, during the second programming period business support and infrastructure have represented slightly less than one third each of the total commitments, with 22% going to agriculture and rural development and 15% to human capital. In Flevoland, infrastructure made more than one third of

the commitments with roughly equal proportions being allocated to the other three axes.

Overall, development strategies for Objective 1 regions have been characterised by a strong imbalance across development axes. With a few exceptions – Northern Ireland, the Highlands and Islands, or Flevoland – CSFs have been heavily biased towards one or two priority areas at the expense of other development axes. The Portuguese regions in the Iberian peninsula or Attica during the second programming periods, with their strong focus on infrastructure, embody the extreme cases of an unbalanced development strategy. Most other regions also suffer, to a greater or lesser extent, from the same problem.

## **2. Measures of success and failure of Structural Funds in Objective 1 regions**

As we have seen, since the reform of the Structural Funds in 1989, the amount of European money aimed at the strengthening of social and economic cohesion and at the reduction of regional disparities across the EU has been multiplied. European development policies have not only become the second largest policy area in the EU, but also represent a significant proportion of public expenditure in Objective 1 regions. However – and in spite of some overly positive European Commission (1999) evaluations of the contribution of the Structural Funds to economic cohesion in Europe – questions have been recently raised about the capacity of Structural Funds to reduce regional inequalities across Europe (Martin, 1999; Hurst, Thisse, and Vanhoudt, 2000; Puga, 2002). It has even been claimed that, in its current form,

European regional development policies are more of an income support or redistribution strategy, than policies capable of setting the bases for sustainable development in lagging regions of the EU (Rodríguez-Pose, 2000: 112; Boldrin and Canova, 2001: 211).

To what extent are these criticisms accurate or fair? Have European development policies more than a decade after the reform of the Structural Funds not succeeded in their objective of delivering greater economic and social cohesion and lower disparities? In this section we will address these issues by looking at two possible measures of success of the European Structural Funds effort in Objective 1 regions. First, we will present the evolution of the number of Objective 1 regions since 1989. Second, we will briefly review recent literature on convergence in Europe, before analysing, using panel data and cross-sectional analyses, whether regional convergence has come to a halt in recent years.

### **2.1. The evolution of regions eligible for Objective 1**

The first factor that casts doubt on the effectiveness of European regional policies since the reform of the Structural Funds is the remarkable stability of the regions eligible for Objective 1. Forty-three of the original forty-four regions that qualified for Objective 1 in 1989 remain in Objective 1 thirteen years after the reform. Only Abruzzo in Southern Italy managed to come out of Objective 1 at the end of 1997. Four other original regions (Corsica, Lisbon and the Tagus Valley, Molise, and Northern Ireland), plus parts of the Republic of Ireland, are being phased out of the Objective and will lose their support at the end of 2005 or 2006 (Figure 2.1). The

stability in the original set of regions has not prevented the number of Objective 1 regions from increasing. For the programming period 2000-6, the number of Objective 1 regions is 67. Even if the 11 regions being currently phased out<sup>6</sup> and the six Scandinavian regions – originally in the former Objective 6 and whose GDP per capita is above the 75% threshold – are not taken into consideration, 50 regions remain in Objective 1, six more than in 1989. Part of the expansion has been the result of the successive enlargements of the EU. The five Länder of the former German Democratic Republic and East Berlin joined Objective 1 after German reunification in 1991. Burgenland became a member when Austria joined the EU in 1995. The remainder joined the Objective as a result of the revision of eligible regions before each programming period. Cantabria in Spain, Hainaut in Belgium, Valenciennes in France, Flevoland in The Netherlands, and the Highlands and Islands and Merseyside in the UK joined Objective 1 in this way for the programming period 1994-9. South Yorkshire, West Wales and the Valleys, Cornwall and the Isles of Scilly (all in the UK) as well as six Scandinavian regions have become Objective 1 in 2000 (Figure 2.1).

**Insert Figure 2.1 around here**

The lack of upward mobility of regions that have been supported at an average level of 1.74% of their GDP for a period of eleven years can be considered as a first indication of the inefficacy of European development policies in Objective 1 regions.

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<sup>6</sup> Cantabria, Valenciennes, the Highlands and Islands, Hainaut, Flevoland, and East Berlin and the above-mentioned Corsica, Lisbon and the Tagus Valley, Molise, Northern Ireland, and parts of the Republic of Ireland.

## **2. 2. Lack of regional convergence since the reform of the Structural Funds**

The second factor behind the scepticism over the effectiveness of European regional policies has been the lack of convergence across European regions since the implementation of the reform of the Structural Funds. The post-war regional convergence detected in numerous studies (Barro and Sala-i-Martin, 1991; Armstrong, 1995; Cheshire and Carbonaro, 1996; Molle and Boeckhout, 1995; Tondl, 2001) has gradually given way to stability or even divergence in the last two decades of the 20<sup>th</sup> century (Magrini, 1999; Rodríguez-Pose, 1999; Cuadrado-Roura, 2001; Puga, 2002). In addition, there is growing evidence of the emergence of convergence clubs (Neven and Gouyette, 1995; Quah, 1996) resulting in increasing polarization and lower economic cohesion across Europe (López-Bazo *et al.*, 1999).

Our analysis of the evolution of European regional disparities since 1989 confirms the absence of convergence, regardless of the method used to analyse regional change.

Figure 2.2 plots the evolution of the nationally weighted<sup>7</sup> standard deviation of regional GDP measured in PPS in the EU (with the exception of Germany), and in the four countries of the Union with the largest number of Objective 1 regions: Greece, Italy, Portugal, and Spain. The general trend is towards greater divergence in three of the four countries analysed and in the EU as a whole. In the whole of the EU, the standard deviation increases by 20.2% since 1989. The greatest increase in regional

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<sup>7</sup> All data is standardised nationally in order to minimise the problems of spatial autocorrelation (See Annex 2 for an explanation in greater detail).

disparities takes place after the implementation of the Single Market in 1993, and is in part the consequence of the change in the regional division in the UK, which accounts for about three fifths of the increase in disparities. However even if this fact is taken into account, there is a considerable growth in the standard deviation in Europe. Between 1994 and 1999 – when the regional sample does not change – it exceeds 8%.

**Insert Figure 2.2 around here**

Greece, Italy, and Spain also experience an increase in regional disparities which seems cut by the same cloth as the evolution of regional disparities in the EU: stability and even slight decline in the late 1980s and early 1990s, followed by a sharp increase in disparities in the second half of the 1990s. The greatest increase in disparities takes place in Spain, where the standard deviation in GDP per capita grows by 15.7% between 1988 and 1999, followed by Greece and Italy with an increase of 11.7% and 1.8% respectively (although in Italy disparities increase by 6.3% if only the period between 1991 and 1999 is considered). Only Portugal, with a 0.6% decline in regional disparities that mainly takes place during the first half of the 1990s, goes in an opposite direction.

We have also conducted cross-section unconditional beta convergence analyses using the traditional Barro and Sala-i-Martin (1992) approach in a variety of ways: including all the EU Nuts II regions or just with the original Objective 1 subset and controlling and not controlling for spatial autocorrelation. The results indicate the existence of slow regional absolute convergence for the period 1989-1999, whenever national growth rates are not considered. The rate of convergence is of 1.3% per

annum (Table 2.1, Model 1). If however national growth is introduced in the model in order to minimise possible problems of spatial autocorrelation the rate of convergence becomes insignificant, confirming that whatever convergence exists at a regional level in the EU is the result of national growth patterns than of any universal tendency towards higher growth in lagging regions (Table 2.1, Model 2) (Esteban, 1994; European Commission, 2001: 4).

### **Insert Table 2.1 around here**

In contrast, if we take just the original Objective 1 regions into account, the panorama is slightly different. There is a significant rate of regional convergence of 4.3 and 3% respectively when regional growth is regressed on the original GDP per capita and when national growth levels during the period of analysis are included in the model (Table 2.1, Models 3 and 4). These results point in the direction of the existence of convergence clubs among lagging European regions (Neven and Gouyette, 1995; Lopez-Bazo et al, 1999) and are in tune with those reported by the European Commission (2001) in the *Second Report on Economic and Social Cohesion*.

Finally, we performed a convergence analysis with panel data, using the same variants as in the cross-sectional analysis. In addition, we include the regional rate of growth GDP per capita with a two-year lag (lag2 GDP) as a further independent variable. This variable is preferred to the same one with a one-year lag (lag1 GDP) in order to avoid problems of endogeneity, since lag1 GDP had been used to compute the growth rate.

The results of the panel convergence analysis indicate an absolute lack of convergence both at EU level, as well as within Objective 1. In both cases the coefficient is positive and not significant (Table 2.2, Models 1 and 2). When the national growth rate is introduced in the models in order to minimise the risk of spatial autocorrelation, the convergence coefficient for the set of European regions is also positive and not significant (Table 2.2, Model 3). In the Objective 1 regions subset it is, in contrast, significant and negative. The magnitude of the observed convergence within this subgroup is, however, extremely low:  $1.36 \cdot 10^{-06}$ , that is a 1000€ difference in GDP per capita in the original year leads to a higher annual growth rate of 0.136% (Table 2.2, Model 4).

**Insert Table 2.2 around here**

The convergence analyses have highlighted, first, that, when taking the national growth into account, there has been no regional convergence in the EU after the implementation of the reform of the Structural funds and, second, that only slow convergence seems to be happening in the subset of Objective 1 regions. This lack of overall convergence and slow convergence across the poorest regions is consistent with the above-mentioned lack of upward mobility of Objective 1 regions, and is a second indication of the inability so far of the European development effort to narrow the regional gap in the EU.

### **3. The impact of the Structural Funds on regional growth**

But, to what extent can the lack of regional convergence across European regions be attributed to the lack of effectiveness of regional development expenditure in Objective 1 regions? Assessing whether European regional development funds have an impact on economic growth is a tricky issue, since many other policy, social, economic, institutional, and cultural factors – in many cases difficult to control – have an influence on economic performance. We will therefore limit ourselves to establishing the simplest connection between the Structural Funds commitments in Objective 1 regions and regional growth across Europe, by conducting a regression model in which regional growth during the period 1989-99 is regressed on the initial GDP per capita (GDP 1989) and on the amount of expenditure on Objective 1 support (Total Regional Funds) in that same period. The model is performed for the whole set of European NUTS II regions (Table 3.1, Models 1 and 2) and for the Objective 1 subset (Table 3.1, Models 3 and 4). In addition we add national growth rates (Real national Growth) in some of the models in order to reduce the risk of spatial autocorrelation (Table 3.1, Models 2 and 4).

**Insert Table 3.1 around here**

Using this type of analysis, the results point to a very weak but positive and significant impact of European Structural Funds on regional growth across Europe. The impact is greater when the whole set of European regions is considered than when just Objective 1 regions are taken into account (Table 3.1.).

However, if the Structural Funds expenditure is divided into its regional and multiregional components<sup>8</sup>, the weak but positive and significant association between Structural Fund Objective 1 commitments and regional growth in Objective 1 regions disappears. As shown in Table 3.2, after regressing the growth of GDP per capita on Structural Funds commitments in Objective 1 regions using panel data, there is no significant statistical relation between the amount of regional funds in Objective 1 and its relative growth rate. This result holds both for funds allocated on an exclusive regional basis and for multiregional commitments. Since the commitments of the Structural Funds are however unlikely to lead to immediate returns in terms of regional growth, we repeat the regression using annual lags and allowing for a maximum of six years between the regional expenditure and its impact on growth. In none of the six annual lags the regression coefficient for the regional or the multiregional commitments is statistically significant (Table 3.2), highlighting that no real positive association between Structural Funds and regional growth in Objective 1 regions can be detected in a period of six years following the initial investment. If instead of considering only Objective 1 regions we repeat the analysis taking all NUTS II regions in the EU into account the results illustrate a similar lack of

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<sup>8</sup> These regressions are conducted without the two countries whose entire territory is completely supported by Objective 1 and have more than one region (Portugal and Greece), as well as without the two countries that in the period of analysis had no Objective 1 regions (Finland and Sweden). This is done in order to avoid the econometric problems related to having allocated multi-regional expenditure to regions on the basis of the population of the region (see Annex 1). The new sample includes 128 NUTS II regions.

connection between regional and multiregional Structural Funds and economic growth (Table 3.3).

**Insert Table 3.2 and Table 3.3 around here**

#### **4. Unbalanced development strategies and regional growth.**

Why have the Structural Funds so far had such a negligible, almost intangible, impact on regional growth? There are multiple factors that might explain why despite the multiplication of funds available for regional development since the reform of the Structural Funds there is little or no evidence of greater economic and social cohesion and convergence across regions in the EU. Some of these explanations bear no connection with the reform of European development policies. One of this is that the process of economic integration across Europe may be favouring the concentration of economic activity in the core of Europe (Brühlhart and Torstensson, 1996; Midelfart-Knarvik et al., 2000). Since 1989 the EU has quickly burnt stages of economic integration. On the 1<sup>st</sup> of January 1993 the single market was created and the 1<sup>st</sup> of January 1999 saw the introduction of the Euro, the European single currency. European integration may be fostering the formation of greater agglomeration economies in the core and leading to the concentration of high-value added scale intensive activities in a few regions, leaving most of the periphery increasingly specialised in low-value added manufacturing and non market-oriented services. The relatively low legal migration across European regions and the deceleration in the shift from agricultural to non-agricultural jobs are also at the root of the slowdown in regional convergence in Europe (Cuadrado-Roura et al., 2000)

Other explanations highlight the distortionary effects of other policies. It has been argued by Midelfart-Knarvik and Overman (2002) that national policies aimed at the protection of certain strategic firms or industrial sectors can provoke distortions which in some cases may contribute to counter the cohesive effects of European development policies. The territorial concentration in core countries and regions of the benefits of other European policies – and especially of the CAP, which represents almost half of the European budget (De la Fuente and Doménech, 2001: 323; European Commission, 2001: 84) – may further dilute the impact of development policies.

A third group of possible explanations points directly to development policy related issues. First, it may be argued that, since the development strategies always have a medium to long-term effect, it may still be too early to accurately assess the impact of the reform of the Structural Funds. A second contention along this line is that, despite the increase in the volume of development funds, the funds available are still too scarce to have any significant impact on growth rates. With Objective 1 funds averaging 1.74% of the GDP of Objective 1 regions, and with the total European development support not exceeding in the best of cases 3.5 to 4% of the GDP of the poorest regions, it could be claimed that current development support does not suffice to counter the imbalances generated by market forces and economic integration. From this point of view, the European development funds could be perceived more as a means of preventing further divergence, rather than as a way to achieve greater cohesion.

In this paper we focus however on an alternative explanation. It concerns the development strategy of Objective 1 regions and the way in which European funds are spent. We will argue that the unbalanced distribution of funds among the main development axes described in section 1 may not be the most adequate strategy to generate medium and long-term growth, but rather an instrument fundamentally targeted at achieving short-term results, and therefore more adept at delivering assistance or income support rather than a genuine development strategy.

As mentioned in Section 1, in the programming period 1994-9, about half of all Objective 1 funds were committed to the development of infrastructure, transport networks, and the environment; business and tourism support represented a bit less than a quarter of the expenditure and the remainder was devoted to human capital development, support to agriculture and rural promotion, and other tasks not easily ascribable to any of the above categories. This pattern of unequal expenditure across these four different axes basically reproduced that of the first programming period. It was also mentioned, that important national and regional differences in the structure of regional commitments were also evident.

The question is to what extent is the unequal distribution of European Objective 1 funds across development axes affecting their impact on regional growth. In order to check how the unbalanced structure of Objective 1 funds affects regional economic growth, we have regressed the commitments in each of the four development axes described in section 1 (support to agriculture and rural promotion [A]; business and tourism support [B]; investments in education and human capital [H]; and investment in infrastructure, transport networks, and the environment [I]), calculated as a

percentage of the regional GDP measured in PPS, on regional growth. We have conducted a cross-section and panel data analysis, using annual lags, in order to capture not only static effects, but also to measure the evolution of the coefficients in time. The classification of regional commitments comes from our revision of the CSFs and the regional Ops for all Objective 1 regions, with the exception of the Länder of the former East Germany.

A number of structural variables are added to the model because of their theoretical importance and statistical significance and represent proxies for the functioning of regional labour market and for the socio-economic and production structures<sup>9</sup>. The functioning of the labour market is represented by a combination of employment rate and youth unemployment rates. It is usually assumed that a high level of labour participation is a symptom of efficient use of available resources. Hence, societies with high levels of employment are considered to have a greater growth potential (Dunford, 1996). Most Objective 1 regions are, however, characterised by relatively low employment rates in the western European context. The youth unemployment rate

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<sup>9</sup> Although ideally we would have liked to introduce in the model some indication of the education levels of the regional population, time series data for education at a regional level in the EU are not available. The introduction of regional education indicators as an alternative in the model proved not to be significant in Objective 1 regions, a factor that, in combination with the relatively average educational attainment levels of many Objective 1 regions, can be interpreted as an indication that these regions have more a problem of assimilating skilled population in the labour market than of shortage of skills.

is a further signal of whether labour markets are capable of assimilating the full potential of local and regional human resources. Since younger generations tend on average to have a higher level of education – measured in years of scholarisation – than the overall working population, the ability or inability to integrate new and potentially more skilled workers into the labour force is an indication of the rigidity of local markets. Most Objective 1 regions feature high youth unemployment rates.

The female employment rate is taken as a proxy of the functioning of local labour markets and of the regional socio-economic structure. Female participation denotes not just another aspect of the fulfilment of human capital potential in the labour market, but also of the role of women in society. Most Objective 1 regions are characterised by low female employment levels.

The high relative level of employment in the primary sector of most of the original Objective 1 regions has driven us to select agricultural employment as proxy of the production structure.

The model adopts the following form:

$$y_{it} = f\{A, B, H, I, emp, yunem, fememp, agremp\} \quad (1)$$

Where:

$y$  is the nationally weighted growth of regional GDP per capita measured in PPS;

$A$  are the annual financial commitments for the support of agriculture and rural promotion;

B are the annual financial commitments targeted at business and tourism support;

H are the annual financial commitments in the fields of education and the redeployment of human capital;

I are the annual financial commitments targeted at infrastructure, transportation networks, and the environment;

emp is the regional rate of employment;

yunem is the regional rate of youth unemployment;

fememp is the regional rate of female employment, and

agremp is the regional rate of employment in the primary sector.

In order to minimise the risk of spatial autocorrelation the dependent variable and all structural variables are weighted nationally (see Annex 2). In the panel data analysis, all structural variables are introduced in the model with a one-year lag as a way to avoid problems of simultaneous causation.

The cross-sectional analysis is conducted by averaging the panel data in time. It is therefore more similar to a between estimator than to a 'real' cross-section, however, since some variables may have cycles. The analysis is performed for three different periods: the 1<sup>st</sup> programming period, 1989-93 (models 1 and 4); the 2<sup>nd</sup>, 1994-9 (models 2 and 5) and the whole period together, 1989-99 (models 3 and 6) both for all NUTS II regions and for all regions that belonged to Objective 1 at any time during the period of analysis. In addition, in order to identify longer term effects, the relative regional economic performance of the second programming period was regressed on the Structural Funds expenditure and the structural variables of the first programming period, both including the average regional GDP per capita for the first programming

period (Initial GDP) (models 9 and 10) and without it (models 7 and 8). The results are reported in Table 4.1.

**Insert Table 4.1 around here**

Although the coefficients and significance of variables vary across models, some common features emerge. Of the structural variables, total employment and youth unemployment tend to be negatively associated to economic growth. The coefficient of female employment generally displays a positive sign, whereas that of employment in the primary sector varies. In all cases the coefficients tend to be not significant across models (Table 4.1).

Of the expenditure variables, expenditure in human capital (H) is positive in ten out of ten and significant at the 5% level in seven out of the ten models. Agriculture support (A) is positive in all models that search for an immediate or short-term association between the support to this development axis and economic growth (Models 1 to 6). This positive association is, however, only significant at the 5% level in Objective 1 regions during the second programming period (Model 5). In contrast, in the longer term, the relationship between economic growth and agriculture support becomes more complex, as depicted by models 7 through 10. When all regions are considered, the pattern is similar to that described for the contemporaneous models: a positive but non-significant association (Models 7 and 9). If only Objective 1 regions are taken into account, the coefficient changes sign becoming significant at the 10% level when the initial GDP per capita is included in the model (Model 10). The connection between regional growth and business and tourism support (B) tends to be positive

and non-significant during the first programming period (Models 1 and 4), becoming negative and significant for the second and the whole period of analysis (Models 2-3 and 5-6). In the models that regress regional growth in the second period on the variables of the first period, the coefficient becomes positive – with the exception of Model 10 – but not significant (Models 7 through 10). The coefficient for infrastructure and environment support (I) tends to be not significant and is negative in eight out of ten cases. In the two cases where the coefficients are significant – models 3 and 6 at the 10% level – the coefficients are negative (Table 4.1).

The panel data analysis presents us with a more dynamic picture of the connection between regional growth and Objective 1 commitments<sup>10</sup>. The panel data analysis is conducted for all regions that belonged to Objective 1 at any moment during the period of analysis (with the exception, once again, of the former East German Länder) using the pooled estimator<sup>11</sup>. The association between structural fund commitments and regional growth is measured for the year of implementation and seven successive

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<sup>10</sup> It has to be borne in mind that a panel data analysis covering a period of only 11 years could pick up short run cyclical, instead of long run effects. However, the harmony between the panel data and the cross-sectional data analysis highlight the fact that cyclical distortions may be relatively unimportant in this case. In addition, in order to avoid problems of residual correlations, the lagged GDP per capita of the regions is left outside of the analysis, although its introduction did not change the results obtained.

<sup>11</sup> Which according to the Breusch and Pagan test is more suitable, since the individual (fixed) effects are not significant.

years, in order to capture the evolution in time of the effects of Objective 1 commitments on regional growth. The results of the regression are reported in Table 4.2.

**Insert Table 4.2 around here**

The results are in strong conformity with those of the cross-sectional analysis. A defined pattern seems to emerge. First, regional commitments to agricultural support and rural restructuring (A) have a strong and significant immediate effect on economic growth in Objective 1 regions. The positive impact however withers away almost immediately and in later years the coefficient becomes strongly negative, albeit not significant (Table 4.2). This pattern of immediate positive effect on growth and waning and even negative returns as time progresses represents the archetype of funds that tend to fulfil an income support rather than a sustainable development role. From this perspective, the agricultural and rural support axis in Objective 1 regions can be regarded as an instrument – as the CAP has to a greater or lesser extent become – of ensuring that farmers and rural dwellers are rewarded for their general contribution to society and for their role in maintaining the environment and preserving Europe’s rural heritage (European Commission, 1997) rather than as a part of a strategy to promote sustainable development. Hence, it is no surprise that the medium-term returns to this type of commitments are insignificant and even negative.

The returns to the two main axes of the Objective 1 development strategy are also disappointing. The development of infrastructure, transportation networks, and the protection of the environment (I), and business and tourism support (B) make up

together about three quarters of Objective 1 intervention. Yet commitments in these two development axes appear to have little or no short or medium-term impact on regional economic growth, as indicated by the lack of significance of any of the coefficients (Table 4.2). The lack of returns of business investment may be related to the deficient competitiveness of many existing businesses in Objective 1 regions. A large percentage of this type of interventions is targeted either at the development of small and medium sized enterprises that will have to operate in relatively difficult economic and institutional contexts and that often lack the capacity and the know-how to compete in open markets, or to the support of larger firms whose comparative advantages and prospects are rather bleak. In either case the medium and long-term returns of this sort of support are likely to be weak and often dependent on changes in the local environment.

The absence of returns of investment in infrastructure (I) in Objective 1 regions may be related to several factors. First, the impact of infrastructure investment on economic activity is never immediate and requires a considerable lapse of time for the full impact to be felt (Vanhoudt et al., 2000). It may thus be argued that a maximum of eight years – as is the span of our panel data analysis – may be too short a period to evaluate the full impact of infrastructure investment in Objective 1 regions. Second, it may be argued that annual commitments may not be the best way of evaluating the full impact of the infrastructural effort in Objective 1 regions. However, as the cross-section analysis showed, especially when growth during the second programming period was regressed on regional commitments during the first period (Models 7 through 10 in Table 4.1), no impact was evident. Finally, the lack of impact of infrastructure investment on regional growth over the period of analysis (Table 4.2)

may be due to the fact that building roads, railways, airports, telecommunication infrastructures, sanitation systems, and recuperating the environment, while improving the quality of life of the inhabitants of the regions benefiting from this sort of investment – and being highly popular and visible activities and, thus, very attractive for politicians (Rodriguez-Pose, 2000) – does not by itself generate the economic dynamism and the firms that will benefit from greater accessibility and improvements in the environment. Since, as noted by Martin (1998, 1999) and Puga (2002) roads, railways, and telecommunication networks run in two directions, a strategy strongly skewed towards the development of infrastructure in regions with relatively vulnerable local production structures, weak entrepreneurship levels and technological base, and an often weaker human capital endowment, while solving an important development bottleneck and reducing the infrastructural gap with the rest of the EU, may be leaving these regions more exposed to competition from stronger and more technologically advanced firms in core areas. Accordingly, and contrary to the views that highlight the adequacy of development strategies based on infrastructure (De la Fuente, 2002), the consequences of such an unbalanced development strategy may not be the lofty economic returns predicted by Aschauer (1989), but more the absence of a connection between infrastructure investment and regional convergence identified by Vanhoudt et al. (2000), Puga (2002) and in this paper.

The only development axis with short and medium-term positive (and close to significant) returns is investment in human capital (H), when certain characteristics of the structure of the labour market are controlled for (Table 4.2). Objective 1 regions harbour significant labour market problems. They either have a shortage of skills, or experience problems of a mismatch between educational supply and labour demand,

since “the evidence suggests that matching the available skills of the work force with those required by an economy undergoing fundamental change has become a major problem” (European Commission, 2001: xxvi). Moreover, an important percentage the potential regional labour force tends to be under-utilised. Human capital problems are accentuated by the lack of mobility of European population in recent decades (Puga, 1999). In this context of inadequate human capital provision and low labour mobility, the less than fifteen percent of the Objective 1 funds supporting education and the redeployment of human capital have the highest and longer lasting returns (Table 4.2). Such a finding is in tune with recent studies (i.e. Duranton and Monastiriotis, 2002; Overman and Puga, 2002), which highlight the importance of the educational attainment of the population in the economic potential of a region and suggest the need of redirecting the focus of supply-side development policies from more traditional areas to education, skills, and human capital.

The robustness of the above-described patterns of association between the different development axes and economic growth in Objective 1 regions is confirmed when the commitments to each individual development axis are considered independently from commitments to other axes. Table 4.3 presents the panel estimation of the impact of commitments in each development axis. The pattern of positive and generally significant coefficients for H, positive and significant but declining coefficients for A and non-significant coefficients for B and I is reproduced.

**Insert Table 4.3 around here**

As a whole, the results of the analysis argue in favour of the establishment of more balanced development strategies across lagging regions in Europe; strategies based on a greater consideration of the place-specific regional characteristics that are at the root of the development problems of these regions (Ioannides and Petrakos, 2000; Thisse, 2000). The results also partially conform to those reported by De la Fuente and Vives (1995) when analysing the impact of supply-oriented development policies. As in their case, we find that public supply-side development strategies play a role – albeit small in the European case – in achieving greater territorial cohesion, and that, in general, investment in education makes a greater contribution to the reduction in regional inequality than investment in infrastructure. But, in contrast to their findings, we cannot infer a link between the size of the redistributive effort affects its impact on regional growth and disparities. Our results seem to point in the direction that size only matters if the regional development strategy is adequate and adapted to the needs and conditions of each region.

## **Conclusion**

In this paper we have examined to what extent the complete overhaul of the European development policies since the reform of the Structural Funds is succeeding in achieving its objectives of greater economic and social cohesion and a reduction in regional disparities across the EU. Our analysis has focused on the impact of the Structural Funds allocated to Objective 1 regions, which represent more than two thirds of the Structural Funds and more than 61% of the total EU development effort. The results underscore that despite the comprehensive 1989 reform of European development policies, the EU is not only still far away from achieving its aim of

greater economic and social cohesion, but also that the questions about the capacity of the development funds allocated to lagging regions in Europe to deliver sustainable economic growth and to reduce the gap between the European core and the periphery seem to be well founded. Two key facts that underlie this scepticism have been substantiated. The first is the failure of Objective 1 regions to rise above the threshold of assistance. Although vested interests in remaining below the threshold may have played a part in the lack of upward mobility, only Abruzzo among the original 1989 Objective 1 regions has managed so far to come fully out of the Objective. The second fact is the lack of convergence experienced by European regions since the reform of the Structural Funds. Despite a closing of the gap at the national level, as a result of high growth in Ireland and, to a lesser extent in Portugal during the 1990s, the panorama at a regional level has been featured – when spatial autocorrelation is taken into account – by stability and lack of convergence.

Although many factors may be behind the relative failure of many lagging regions to catch-up, in this paper we have established a link between the unbalanced structure of the regional development strategies financed by European funds and the lack of regional convergence across western Europe. As a whole, development strategies in Objective 1 regions have been extremely unbalanced. On average around half of all fund have been targeted at the building of infrastructure and the protection of the environment. In most Portuguese and Spanish regions, as well as in Attica in Greece more than 70% of the funds available has been earmarked for these purposes. Close to a quarter of the total funds has been aimed at business support. This has been one of the preferred development axes in certain Italian regions and in Hainaut in Belgium and Burgenland in Austria. However, the results of the cross-sectional and panel data

regression analyses underline that investment in these development axes has so far had a negligible impact on regional growth both across the whole of the EU and if only Objective 1 regions are taken into consideration.

The investment in agricultural support and rural restructuring, which amounts to less than a tenth of the total, presents a profile which is closer to that of an income support strategy than a of a sustainable development policies. While the impact of this sort of support on economic growth is positive in the very short-term, this positive influence wanes in time and becomes progressively negative. The only medium-term positive influence detected is that of the funds targeted at education and the development of human capital. Regardless of the method of analysis used, the connection between the share of funds aimed at improving the local endowment of human capital and economic tends to be positive and often significant, with the association being stable in time.

The emphasis on unbalanced development strategies seems in some cases to have backfired. Whereas the regions that have implemented the most balanced distribution of funds across the four development axes included in the paper – basically Flevoland in the Netherlands and the Highlands and Islands and Northern Ireland in the UK – have managed to come out of Objective 1 in a relatively short period of time or are currently being phased out, regions with extremely unbalanced strategies have in general not been able to narrow the economic gap with the core of Europe. This is especially true of regions like Asturias or Valencia in Spain, which is spite of being relatively close to the 75% of the EU GDP threshold in 1989 and in spite of a relatively high national growth during the period of analysis, have been unable to

converge. Corsica, in France, has experienced relative economic decline during this period. In these regions the implementation of development strategies based on fundamentally on infrastructure has left them exposed to other markets while devoid of the local firms or the necessary human capital to be able to compete in a more open economic environment. Similarly, many of the southern Italian regions that invested heavily in local business support have been incapable of catching-up, and the emphasis on agricultural and rural support in some northern Greek and Spanish regions has equally not paid off.

The prescription of this paper is thus that any future revision of European development policies – which looks increasingly likely as a result of the future enlargement of the EU – should take into consideration the risks associated to the implementation of unbalanced development strategies, often responding to political or national interests, in what are vulnerable economic contexts. As we have seen, these strategies not only do not deliver higher economic growth in the short and medium terms, but may be also failing to prepare assisted regions to face the economic challenges ahead, leaving them as – if not more – vulnerable to future competition as they were before the support started. Hence, the implementation of more balanced and region-specific development strategies may be needed if the European development policies are to become true sustainable development strategies rather than just another means of income support.

## **Annex 1**

### **Data**

The European Statistical Office (EUROSTAT) is the main source for data used in this paper. Regional GDP data and all the structural labour market and employment data stem from this source.

The Structural Fund data used in the analysis were constructed by the authors from the CSFs for the programming periods 1989-93 and 1994-9 and from the annual reports on the implementation of the reform of the Structural Funds. Unfortunately the breakdown by year and region was not always easily available. In the few cases – all before 1994 – for which only national, instead of regional, breakdowns of commitments are available, we have used the breakdown of the ERDF (which is by far the most important financial instrument in Objective 1) as a proxy for the overall regional quotas of all the structural funds. In a handful of cases concerning 1992 and 1993 for which no data were found, the regional commitment quotas were assumed to be equal to the average of the period 1989-91. In the case of Greece, EU transfers to municipalities were used instead for 1992 and 1993.

The greater availability of data for commitments than for actual expenditure during the first years after the reform of the Structural Funds led us to choose the former over the latter. We assume that Structural Funds commitments and expenditure are strongly correlated.

For the calculation of the annual commitments to the four different development axes (A, B, H, I) we resorted, for the period 1994-9, to the re-elaboration of the operation projects (available in the Inforegio website [[www.inforegio.cec.eu.int](http://www.inforegio.cec.eu.int)]), according to the criteria described in the text. For the period 1989-93 only the CSFs were available. Since no regional breakdown exists in this period for Portugal and Greece, we presuppose that regional commitment quotas across the four development axes are equal to the national quota. In addition, no annual breakdown of commitment quotas is available. Therefore it is assumed that the quotas remain stable during the programming periods changing only from 1994 onwards. The annual commitment to A, B, H, I is calculated as product of the quota and the annual commitment for the region.

The commitments are only available in nominal terms. We assume that the impact of 1 nominal Euro in regions with different level of prices is not the same. Hence, in order to obtain the percentages of expenditure (our independent variables), we divided the nominal commitments by the total GDP pps, and not by the nominal GDP.

Our dependent variable is the real growth rate of GDP per capita. This is calculated by using national deflators on the nominal growth rates of GDP pps. We used national deflators, because regional deflators were not readily available for all regions and for the whole period of analysis. Given that the calculation of pps is done on a national basis, the use of national deflators is not expected to create significant distortions.

Since, in order to minimise the problems of spatial autocorrelation, we frequently resort to nationally standardised variables (see Annex 2 for a more detailed

explanation), countries with just one region (Luxembourg, Ireland, and Denmark) were excluded from the parts of the analysis where these variables are used. German regions are also not considered in the analysis, as a result of the high volatility in regional growth rates (especially in the eastern Länder) after re-unification. Such changes would have provoked huge alterations in the analysis, especially bearing in mind that in the rest of the EU nothing of comparable importance happened. The regions of the remaining eleven countries of the EU make up the database.

Finally, the French overseas departments are also excluded from the analysis for a twofold reason: first, the information concerning these regions is often scarce, and, second, because we believe that, due to their geographical location, the factors guiding their economic growth are very different from those affecting regions in western Europe.

## Annex 2

### Spatial autocorrelation

Recent studies of the evolution of regional disparities in Europe have tended to highlight the existence of a serious problem of spatial autocorrelation, that is a lack of independence among observations representing neighbouring regions (Armstrong, 1995; Quah, 1996; Niebuhr, 2001). Our analysis is no exception as significant national effects appeared in preliminary models. Tests of the influence of national growth rates on regional growth, by adding the lagged dependent variable and the national growth parameter to preliminary models always produced results that were close to 1 and significant. These results implied that regional growth in the EU was extremely related to national growth rates, i.e.: regions within a same country tend to grow at similar rates.

In order to minimise the problems of spatial autocorrelation in the error term and the distortions it generates on models we decided to transform in most of our models – following a variant of the system used by Rodríguez-Pose (1999) – the dependent variable and the structural independent variables into nationally weighted variables.

We used the following formula:

$$\left( \frac{100 + \%G_r}{100 + \%G_c} - 1 \right) 100 \quad (2)$$

where G denotes growth of GDP per capita measured in pps and r and c stand for region and country respectively.

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Figure 2.1. The evolution of Objective 1 regions in the EU

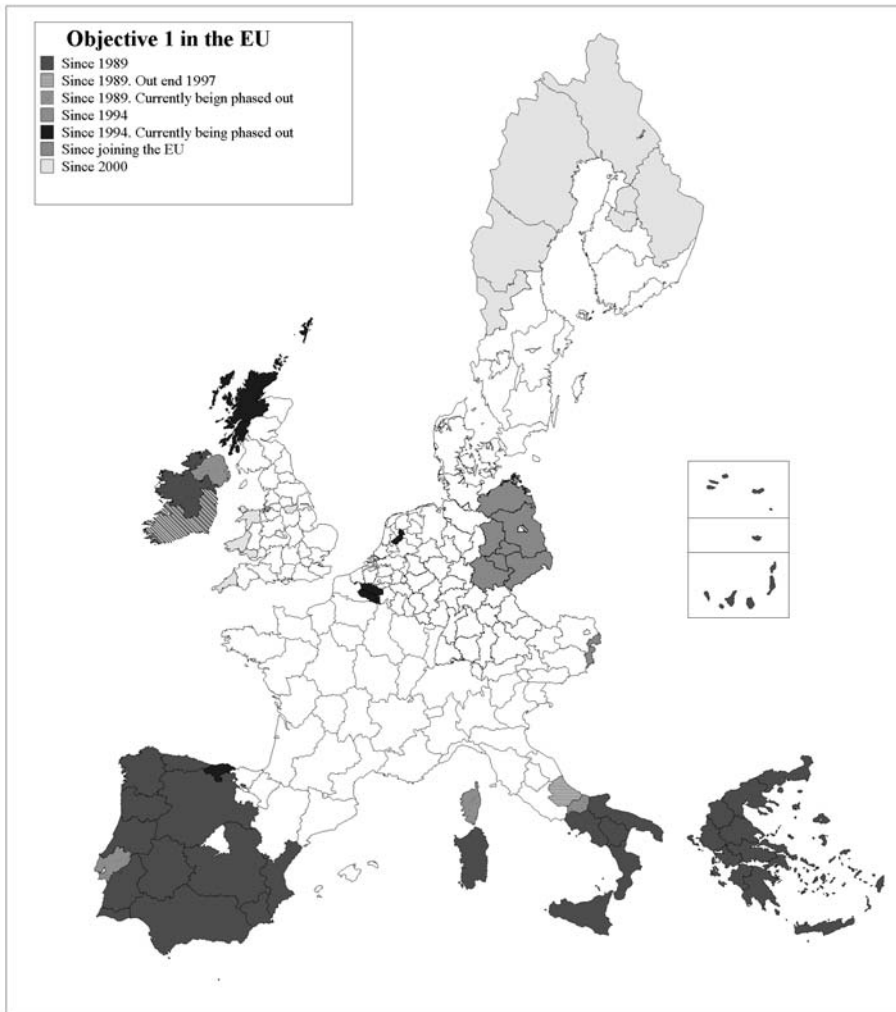
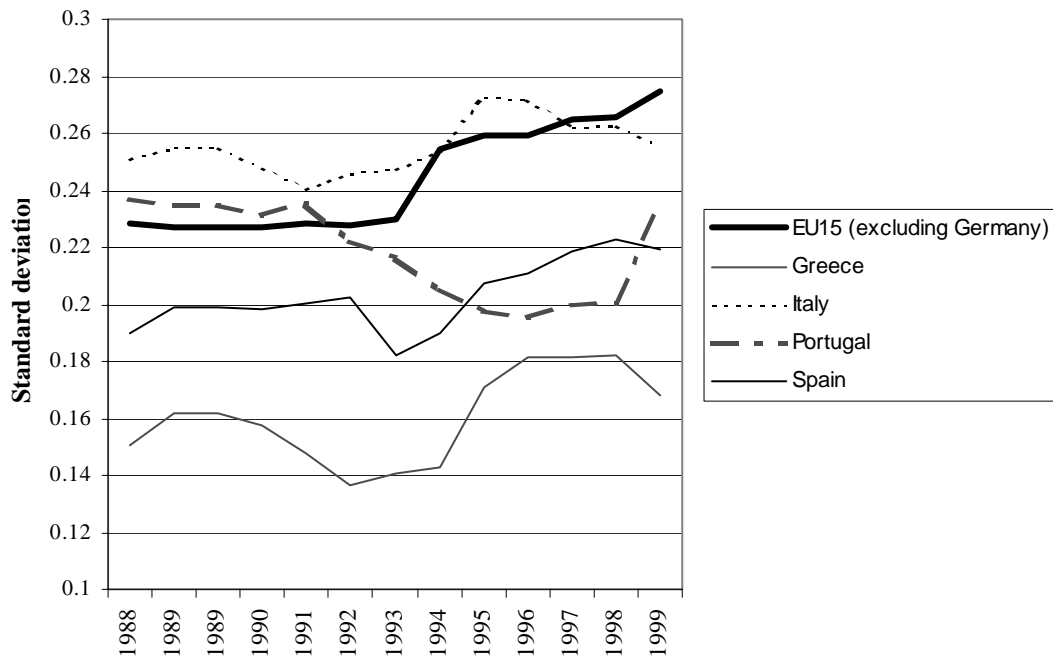


Figure 2.2. The evolution of standard deviation of regional GDP per capita in the EU and in the Cohesion countries since the reform of the Structural Funds.



**Table 1.1****Community Expenditure**

<b>Community Expenditure</b>	<b>1980</b>	<b>1985</b>	<b>1989</b>	<b>1993</b>	<b>1997</b>	<b>2001</b>
Percentages of outturn in payments:						
EAGGF Guarantee Section (C.A.P.)	68.6	68.4	57.7	52.4	49.6	46.1
Development Funds	11.0	12.8	18.8	30.7	32.3	33.2
— Of which: Cohesion Fund	0.0	0.0	0.0	1.2	2.9	2.6
— Of which: Structural Fund	11.0	12.8	18.8	29.5	29.4	30.6
Other	20.4	18.7	23.5	17.0	18.1	20.7
Community Expenditure as % of Community GDP	0.8	0.92	0.94	1.18	1.12	1.09
Expenditure per capita (EUR)	62.7	105.2	129.5	191.1	217.1	255.2
Development funds on EU GDP (%)	0.09	0.12	0.18	0.36	0.36	0.36
Structural Funds per capita (EUR 2000 prices)	13.63	21.09	32.21	69.17	75.80	83.40
(data for 2001 are provisional)						

**Table 2.1****Cross-section unconditional  $\beta$  convergence analysis (1989-99)**

<b>Regression</b>	<b>[1]</b>	<b>[2]</b>	<b>[3]</b>	<b>[4]</b>
Regions included:	All regions	All regions	Objective 1	Objective 1
Number of obs.	152	152	44	44
F	13.17	50.69	24.82	14.84
Prob>F	0.0004	0.0000	0.0000	0.0000
R <sup>2</sup>	0.0746	0.4049	0.3606	0.4084
Adj. R <sup>2</sup>	0.01157	0.3969	0.3461	0.3809
GDP 1989 standardised*	-0.01356	0.00016	-0.04194	-0.02958
<i>significance</i>	<i>0.000</i>	<i>0.961</i>	<i>0.000</i>	<i>0.007</i>
Annual national growth	not included	0.92836	not included	0.51758
<i>significance</i>		<i>0.000</i>		<i>0.069</i>
Constant	0.06083	0.00242	0.09424	0.05398
<i>significance</i>	<i>0.000</i>	<i>0.737</i>	<i>0.000</i>	<i>0.024</i>

\* See Annex 2 for an explanation of the standardisation methods.

**Table 2.2**

**Panel unconditional  $\beta$  convergence analysis (1989-99)**

<b>Panel unconditional <math>\beta</math> convergence (period 1989-99)</b>									
	<b>[1]</b>		<b>[2]</b>		<b>[3]</b>		<b>[4]</b>		
Regions	All		Objective 1		All		Objective 1		
Observations	1348		414		1348		414		
Groups	162		47		162		47		
Average obs. per group	8.32		8.81		8.32		8.81		
R-sq: within	0.0075		0.0195		0.1822		0.1571		
between	0.0034		0.0887		0.1683		0.1012		
overall	0.0018		0.0001		0.1773		0.1503		
	<b>coeff.</b>	<b>sig.</b>	<b>coeff.</b>	<b>sig.</b>	<b>coeff.</b>	<b>sig.</b>	<b>coeff.</b>	<b>sig.</b>	
Real National Growth					0.9905	0.000	1.0430	0.000	
lag2 GDP	3.48E-07	0.123	2.05E-07	0.809	5.48E-08	0.790	-1.36E-06	0.090	
Constant	0.0120	0.001	0.0148	0.121	-0.0012	0.728	0.0128	0.144	
Breusch and Pagan LM test									
chi <sup>2</sup>	3.17		0.54		1.76		0.25		
Prob > chi <sup>2</sup>	0.0752		0.4634		0.1842		0.6158		

**Table 3.1****The link between European Structural Fund support in Objective 1 regions and regional growth. Cross-sectional analysis**

<b>Dependent variable: growth in the period 1989-99</b>				
	<b>[1]</b>	<b>[2]</b>	<b>[3]</b>	<b>[4]</b>
Sample	All	All	Objective 1	Objective 1
Observations	152	152	46	46
F	15.3	34.61	13.93	10.79
P>F	0	0	0	0
R-squared	0.1704	0.4123	0.3931	0.4352
Adj. R-squared	0.1593	0.4004	0.3649	0.3949
GDP 1989	-4.58E-06	7.32E-06	-6.34E-05	-4.01E-05
<i>significance</i>	0.431	0.155	0.002	0.083
Total Regional Funds	0.1213	0.0812	0.0706	0.073
<i>significance</i>	0.000	0.002	0.068	0.054
Real National Growth		0.8789		0.5407
<i>significance</i>		0.000		0.084
Constant	0.6226	-0.0452	1.1823	0.5976
<i>significance</i>	0.000	0.675	0.000	0.121

**Table 3.2**

**The link between European Structural Fund support in Objective 1 regions and regional growth. Panel data analysis with Objective 1 regions**

Regions included: Objective 1 regions (with the exception of Greek and Portuguese regions)														
Lag	No Lag	Lag1	Lag1	Lag2	Lag2	Lag3	Lag3	Lag4	Lag4	Lag5	Lag5	Lag6	Lag6	
Estimator	Pooled (GLS)	LSDV	Pooled (GLS)	LSDV	Pooled (GLS)	LSDV	Pooled (GLS)	LSDV	Pooled (GLS)	LSDV	Pooled (GLS)	LSDV	Pooled (GLS)	LSDV
Observations	287	287	261	261	237	237	213	213	187	187	161	161	135	135
Groups	27	27	27	27	27	27	27	27	27	27	27	27	27	27
Avg. obs. per group	10.63	10.63	9.67	9.67	8.78	8.78	7.89	7.89	6.93	6.93	5.96	5.96	5.00	5.00
R <sup>2</sup> within	0.0019	0.0024	0.0000	0.0010	0.0019	0.0052	0.0097	0.0117	0.0105	0.0131	0.0052	0.0057	0.0062	0.0092
Between	0.0320	0.0051	0.0431	0.0272	0.0136	0.0206	0.0000	0.0079	0.0197	0.0081	0.0014	0.0003	0.0467	0.0130
Overall	0.0028	0.0020	0.0013	0.0000	0.0022	0.0005	0.0030	0.0024	0.0084	0.0072	0.0028	0.0025	0.0133	0.0083
Regional funds (% on GDP)	-0.172	-0.221	-0.030	-0.141	-0.130	-0.353	-0.187	-0.613	-0.035	-0.368	0.159	0.407	0.309	0.581
<i>significance</i>	0.444	0.434	0.904	0.659	0.626	0.321	0.517	0.141	0.914	0.442	0.631	0.438	0.390	0.339
Multiregional funds (% on GDP)	0.355	0.117	0.339	-0.065	0.409	0.035	0.435	0.615	1.008	1.995	0.301	0.268	0.840	0.073
<i>significance</i>	0.515	0.903	0.569	0.950	0.522	0.975	0.546	0.632	0.219	0.162	0.721	0.848	0.385	0.968
Constant	-0.284	-0.171	-0.331	-0.130	-0.294	-0.036	-0.355	-0.155	-0.623	-0.706	-0.719	-0.838	-0.969	-0.908
<i>significance</i>	0.253	0.626	0.212	0.728	0.278	0.923	0.214	0.703	0.046	0.111	0.022	0.058	0.006	0.094

**Table 3.3**

**The link between European Structural Fund support in Objective 1 regions and regional growth. Panel data analysis with all regions**

Regions included: all regions (bar Greek, Portuguese, Finish, and Swedish regions)														
Lag	No Lag	No Lag	Lag1	Lag1	Lag2	Lag2	Lag3	Lag3	Lag4	Lag4	Lag5	Lag5	Lag6	Lag6
Estimator	Pooled (GLS)	LSDV	Pooled (GLS)	LSDV	Pooled (GLS)	LSDV	Pooled (GLS)	LSDV	Pooled (GLS)	LSDV	Pooled (GLS)	LSDV	Pooled (GLS)	LSDV
Observations	1312	1312	1190	1190	1098	1098	1006	1006	884	884	762	762	640	640
Groups	128	128	128	128	128	128	128	128	128	128	128	128	128	128
Avg. obs. per group	10.25	10.25	9.30	9.30	8.58	8.58	7.86	7.86	6.91	6.91	5.95	5.95	5.00	5.00
R <sup>2</sup> : within	0.0005	0.0005	0.0002	0.0002	0.0009	0.0009	0.0018	0.0020	0.0004	0.0023	0.0004	0.0008	0.0001	0.0013
between	0.0196	0.0204	0.0054	0.0053	0.0044	0.0044	0.0070	0.0030	0.0044	0.0041	0.0196	0.0194	0.0053	0.0063
overall	0.0021	0.0020	0.0007	0.0007	0.0012	0.0012	0.0021	0.0016	0.0009	0.0000	0.0021	0.0016	0.0008	0.0003
Regional funds (% on GDP)	-0.284	-0.221	-0.156	-0.141	-0.248	-0.353	-0.334	-0.613	-0.277	-0.368	-0.113	0.407	-0.004	0.581
<i>significance</i>	0.200	0.462	0.526	0.683	0.367	0.371	0.267	0.184	0.410	0.485	0.767	0.518	0.992	0.430
Multiregional funds (% on GDP)	-0.002	0.117	-0.051	-0.065	0.035	0.035	-0.037	0.615	0.151	1.995	-0.718	0.268	-0.568	0.073
<i>significance</i>	0.996	0.909	0.926	0.954	0.954	0.977	0.957	0.666	0.844	0.204	0.409	0.873	0.572	0.973
Constant	0.001	-0.017	-0.032	-0.033	-0.011	0.004	-0.021	-0.025	-0.052	-0.149	-0.072	-0.182	-0.140	-0.235
<i>significance</i>	0.994	0.865	0.695	0.763	0.902	0.974	0.825	0.835	0.611	0.266	0.541	0.210	0.310	0.182



**Table 4.2.**

**Commitments to the four development axes regressed on regional growth. Panel data analysis.**

	Current year	Lag1	Lag2	Lag3	...	Lag6	Lag7	
(Objective 1 regions only)								
Number of groups	47	47	47	47		47	47	
Avg obs per group	9.3	9.3	8.4	7.6		4.8	3.9	
Max obs per group	10	10	9	8		5	4	
R <sup>2</sup> within	0.0138	0.0040	0.0061	0.0161		0.0121	0.0608	
R <sup>2</sup> between	0.3565	0.3769	0.3321	0.3271		0.2099	0.2622	
R <sup>2</sup> overall	0.0476	0.0391	0.0394	0.0492		0.0489	0.0899	
	<b>coeff.</b>	<b>sig.</b>	<b>coeff.</b>	<b>sig.</b>	<b>coeff.</b>	<b>sig.</b>	<b>coeff.</b>	<b>sig.</b>
A	2.2106	0.052	0.2317	0.836	1.1315	0.384	-0.9407	0.541
B	-0.0650	0.927	-0.6445	0.378	0.2787	0.739	-1.4127	0.158
H	1.5021	0.114	1.6008	0.101	1.6799	0.111	1.7600	0.131
I	-0.6767	0.171	-0.1416	0.795	-0.6312	0.292	0.4211	0.540
Emp	-9.2010	0.001	-8.7206	0.002	-9.6148	0.001	-9.1714	0.004
Yunem	-1.6619	0.006	-1.5305	0.013	-1.5785	0.019	-1.3695	0.067
Fememp	3.7447	0.051	3.2833	0.087	4.6274	0.027	3.6687	0.116
Agremp	-0.2371	0.359	-0.1460	0.574	-0.1743	0.536	-0.0189	0.950
Constant	7.1961	0.003	6.9246	0.005	6.5713	0.014	6.5627	0.027
Breusch-Pagan							9.4421	0.049
chi <sup>2</sup>	3.1500		3.6600		3.6100		1.5200	
Prob > chi <sup>2</sup>	0.0761		0.0557		0.0575		0.2174	
							5.0894	0.218
							3.2000	
							0.0736	

**Table 4.3****Panel estimation of impact of commitments**

	AGRICULTURE		BUSINESS		HUMAN CAPITAL		INFRASTRUCTURE	
<b>Lags</b>	<b>coeff.</b>	<b>sig.</b>	<b>coeff.</b>	<b>sig.</b>	<b>coeff.</b>	<b>sig.</b>	<b>coeff.</b>	<b>sig.</b>
No lag	2.64184	0.011	0.04080	0.946	0.96726	0.099	0.06571	0.830
Lag1	1.07566	0.293	-0.00040	0.999	1.15333	0.044	0.37431	0.223
Lag2	1.76516	0.127	0.45525	0.504	1.11696	0.067	0.28840	0.379
Lag3	1.12091	0.401	-0.05990	0.942	1.68867	0.010	0.73076	0.040
Lag4	1.30357	0.369	0.40540	0.702	1.09613	0.129	0.43997	0.289
Lag5	-1.78680	0.286	0.14490	0.909	0.88395	0.251	0.63257	0.179
Lag6	-0.46000	0.809	-1.71950	0.451	1.36230	0.111	0.24743	0.657

Table A.1 Structural funds expenditure from 1980 onwards.

Percentages of EU outturn in payments	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
General budget:											
EAGGF Guarantee Section	68.6	59.7	57.6	62.1	65.4	68.4	61.7	63.3	62.1	57.7	56.1
Development Funds	11.0	19.2	21.5	16.0	11.5	12.8	15.8	16.2	15.1	18.8	21.0
— Of which: Cohesion Fund	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
— Of which: Structural Funds	11.0	19.2	21.5	16.0	11.5	12.8	15.8	16.2	15.1	18.8	21.0
Research	2.2	1.7	2.1	5.3	5.9	2.4	2.2	2.7	2.7	3.6	3.9
External	3.7	4.0	4.2	3.5	3.6	3.3	3.0	2.2	1.8	2.5	3.1
Administration	5.0	5.1	4.9	4.4	4.3	4.5	4.3	4.7	4.5	4.9	5.1
Repayments and other	5.8	6.0	5.9	5.0	5.9	5.2	9.8	7.7	10.4	8.9	7.3
General budget - Total	96.4	95.7	96.1	96.4	96.6	96.7	96.8	96.8	96.5	96.4	96.6
EDF	2.9	3.6	3.0	2.8	2.5	2.4	2.4	2.3	2.8	3.1	2.8
ECSC	0.7	0.8	0.9	0.8	0.9	0.9	0.8	0.9	0.7	0.5	0.6
Grand total	100	100	100	100	100	100	100	100	100	100	100
Annual growth in nominal terms (%)	11.4	12.6	15	19.4	10.3	2.8	24.2	1.2	17.3	-0.5	7.9
Total Community expenditure (2000 prices) (EUR million)	32533	33849	36762	41759	44071	45035	54527	52919	58918	55974	57416
Annual growth in real terms (%)	1.7	4	8.6	13.6	5.5	2.2	21.1	-2.9	11.3	-5	2.6
Community expenditure as % of public expenditure in Member States	1.7	1.7	1.7	1.9	1.9	1.9	2.1	2	2.2	2	2
Expenditure as % of Community GDP	0.8	0.8	0.85	0.94	0.96	0.92	0.99	0.96	1.03	0.94	0.94
Expenditure per capita (EUR)	62.7	67.9	78	93	102.4	105.2	110.8	111.8	130.7	129.5	138.8
Expenditure per capita (EUR, 2000 prices)	124	124.1	134.6	152.7	161	164.2	168.6	163.3	181.2	171.4	174.8
Development Funds per capita (EUR, 2000 prices)	13.63	23.89	28.88	24.50	18.49	21.09	26.66	26.41	27.37	32.21	36.76
Development Funds on EU GDP (%)	0.09	0.15	0.18	0.15	0.11	0.12	0.16	0.16	0.16	0.18	0.20

**Table A.1 Structural funds expenditure from 1980 onwards. (continued)**

Percentages of EU outturn in payments	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
						(provis.)				(provis.)	(provis.)
General budget											
EAGGF Guarantee Section	56.5	51.4	52.4	53.6	50.4	50.0	49.6	47.4	46.5	45.0	46.1
Development Funds	25.4	30.2	30.7	25.8	28.1	31.3	32.3	34.7	35.8	34.6	33.2
— Of which: Cohesion Fund	0.0	0.0	1.2	1.4	2.5	2.4	2.9	2.8	3.2	3.0	2.6
— Of which: Structural Funds	25.4	30.2	29.5	24.4	25.6	28.9	29.4	31.9	32.5	31.6	30.6
Research	3.1	3.1	3.3	4.0	3.6	3.7	3.7	3.6	3.1	3.9	3.8
External	4.0	3.5	4.3	5.0	5.0	4.9	4.7	5.0	5.6	6.0	6.6
Administration	4.8	4.7	5.0	5.8	5.7	5.1	5.1	5.1	4.8	5.1	5.1
Repayments and other	3.5	3.2	1.4	2.2	4.5	3.0	2.6	2.3	2.6	2.3	2.3
General budget — Total	97.3	96.1	97.1	96.4	97.3	98.0	97.9	98.0	98.3	97.0	97.2
EDF	2.2	3.2	2.0	2.9	2.3	1.7	1.5	1.7	1.5	2.9	2.6
ECSC	0.6	0.7	0.9	0.7	0.4	0.3	0.6	0.2	0.2	0.2	0.2
Grand total	100	100	100	100	100	100	100	100	100	100	100
Annual growth in nominal terms (%)	20.6	10.6	9.7	-7.9	11.3	14.9	3.7	1.2	3	8.6	4.8
Total Community expenditure (2000 prices) (EUR million)	66983	73159	78736	71929	77446	86576	88212	87133	87303	92253	95130
Annual growth in real terms (%)	16.7	9.2	7.6	-8.6	7.7	11.8	1.9	-1.2	0.2	8.6	3.1
Community expenditure as % of public expenditure in Member States	2.2	2.2	2.3	2.1	2.1	2.3	2.3	2.3	2.3	2.4	2.4
Expenditure as % of Community GDP	1.03	1.09	1.18	1.04	1.04	1.14	1.12	1.09	1.07	1.09	1.09
Expenditure per capita (EUR)	158.9	175	191.1	175.5	183.2	209.9	217.1	219.3	225.3	244	255.2
Expenditure per capita (EUR, 2000 prices)	193.5	210.4	225.4	205.3	207.4	231.2	235	231.6	231.5	244	251.1
Development Funds per capita (EUR, 2000 prices)	49.14	63.55	69.17	53.00	58.28	72.43	75.80	80.35	82.78	84.52	83.40
Development Funds on EU GDP (%)	0.26	0.33	0.36	0.27	0.29	0.36	0.36	0.38	0.38	0.38	0.36