DO INTERREGIONAL TRANSFERS IMPROVE THE ECONOMIC PERFORMANCE OF POOR REGIONS? THE CASE OF SPAIN

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ABSTRACT: The 17 regional governments of Spain receive grants from both the central government and the European Union. The grants are generally redistributive and are intended to stimulate economic activity in the poorer regions. We evaluate the effectiveness of the grants by comparing the economic performance of the regions before and after the implementation of the grant programs using a differences-in-differences approach. We find that these policies have not been effective at stimulating private investment or improving the overall economies of the poorer regions.

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Introduction

The Spanish economy has experienced dramatic economic changes in the last three decades, and its economic performance has slowly approached the European average, although not consistently over time. At the beginning of the 1960s GDP per capita in Spain was less than 60 percent of the average of the countries that now comprise the European Union, but by 1975 the Spanish figure was nearly 80 percent of the average. It fell again after the oil crisis and the important political and social changes that occurred in Spain on its road to democracy, but by the early 1990s Spain was 75 percent of the European average. [1]

Within this broad context, regions in Spain exhibited large differences among themselves in GDP per capita. Even though Spain slowly approached the European average, some regions have been near the European average since the 1960s (for example, País Vasco, Madrid and Cataluña), while Baleares actually exceeded the average in the 1990s. Other regions were around one-third of the average in the 1960s (Extremadura, Andalucía, Castilla-La Mancha and Galicia are examples) and had barely reached 50 percent of the European average by the 1990s.

Although the Spanish government made attempts at regional policy in the 1960s (the "Planes de Desarrollo" is the most characteristic example), it was not until the decentralization process in the 1980s, which created the regional governments called Comunidades Autónomas or Autonomous Communities, that a regional

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[1]See Marimón (1996) for a detailed description of the economic fortunes of Spain during the past three decades.

solidarity fund was established. The Fondo de Compensación Interterritorial (FCI) was established in 1982 as a redistributive fund aimed at reducing disparities among regions through mainly public investment projects. [2] With the addition of Spain to the European Community in 1986, the regions in Spain also benefitted from the European regional policy, and especially the European Fund for Regional Development (FEDER).

The purpose of both of these regional policies, the Spanish central government FCI policy and the regional policy of the European Union, was to encourage the development of poor regions in order to reduce large differences among the regions. How successful these policies have been in achieving their goal is still an open question, and is the subject of this paper. Essentially, we address two questions: i) What have been the fortunes of poorer regions in Spain and their relative evolution with respect to richer regions since the implementation of regional policies?, ii) What have been the private market responses to these policy innovations, and in particular, has private investment been stimulated by the regional policies?

Several studies have analyzed the evolution of the regional economies of Spain, without relating them explicitly to regional policies. These studies can be framed within the convergence literature that follows the work of Barro and Sala-i-Martín (1991) and that for Spain has materialized mainly in two papers, Dolado et al.

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[2]See Garcia-Milà and McGuire (1991) and (1993) for an analysis of the FCI program and its effects on the public finances of the Autonomous Communities. They find that the FCI is largely a redistributive grant and that the regional governments have very little autonomy over spending.

(1994), which examines convergence at the provincial level for 1955-89, and Mas et al. (1994a), which analyzes regional convergence for 1981-91. They find that the convergence process in Spain is strong until the mid 1970s, but then it slows or is nonexistent during the 1980s, a pattern that is not unique to Spain (see Canova and Marcet, 1995).

An important characteristic of the regional grants is their relationship to public investment, and it is therefore important to consider the literature that has analyzed for Spain the impact of public capital on the development of regional economies. Mas et al. (1994b) estimates a Cobb-Douglas production function with public capital as one input for the 17 regions of Spain for 1980-89 and finds a range of 0.182 to 0.220 for the elasticity of output with respect to public capital. The authors do not test for stationarity of the series; if non-stationarity is present as other similar studies have found, it would shed doubt on the significance of these results (see Garcia-Milà, McGuire and Porter, 1996).

The work of de la Fuente and Vives (1995) attempts to address directly the issue of whether the European Union's FEDER grant was effective at stimulating regional growth. Because they lack regional private investment data, they assume perfect mobility of private capital and perfect immobility of labor and public capital. Assuming that FEDER funds are spent on public capital, they evaluate its impact on regional growth through the response of output to public capital in their estimated regional production function, concluding that the FEDER funds had a small but significant effect on output. There are limitations to this analysis related to the lack of

data and the assumptions made. First, they are restricted to three years of public capital data for estimation of the production function. Second, the assumptions made about the mobility of the factors can be questioned; important differences in average productivity of private capital observed in Spain's regions suggest that there may not be perfect mobility of private capital among the regions of Spain.

While it remains controversial as to whether public investment has been a major factor in the development of regions, it is important to understand to what extent any impact has been more than the direct effect generated by the public investment in a region; in other words, is the public investment triggering any private economic activity besides the activity directly related to the intervention? Garcia-Milà and Marimón (1996) attempt to answer this question by undertaking a sectoral analysis of the regional economies of Spain. They find that development of poor regions with large public interventions during the 1980s, such as Andalucía, Extremadura and Castilla-La Mancha, occurred in the public or semi-public sectors, but there was little improvement in the manufacturing or private services industries.

In this paper we continue the lines of inquiry that seek to evaluate the overall impact of public interventions in regional economies and to determine to what extent the private market responds to these types of public incentives. A variable of primary interest is private investment because, in the long run, only if private investors are induced by the public intervention to invest in poor regions can the intervention be deemed a success.

In section I we summarize the regional policies of both the Spanish and the

European governments. Section II is a description of the economic performance of the regions of Spain between 1964 and 1994. In section III we analyze how the regional policies have affected the economies of the regions by comparing their economic performance before and after the regional public interventions. In the final section we present our conclusions.

I. Regional Grants from the European Union and the Central Government of Spain

Regions in Spain receive regional grants from two sources, the Spanish central government and the European Union. The Spanish redistributive or solidarity fund (Fondo de Compensación Interterritorial, FCI) was created in 1982, within the framework of fiscal decentralization that began in Spain in 1979. Initially, the FCI was designated as a certain percentage of the central government's public infrastructure investment, with the idea of reinforcing public investment in all regions, but favoring those regions with relatively low income per capita, net out-migration of population, and relatively high levels of unemployment. With time the FCI became less redistributive and it evolved into a method of financing responsibilities given to the regional governments by the central government. In 1990 the FCI was revised once again to be a purely redistributive grant, and after a period of transition, only relatively poor regions received monies under the FCI. Also, more flexibility was allowed for how the FCI monies could be spent in order better to coordinate with the funds received from the European Union.

Grants from the European Union (EU), which Spain began to receive in 1986

upon its entry into the EU, can be grouped into three types of policies: i) Agricultural Policy, with two main programs, FEOGA-Garantía and FEOGA-Orientación, ii) Social Policy, mainly the Social European Fund (FSE), and iii) Regional Policy, mainly the European Regional Development Fund (FEDER). Of the three the Agricultural Policy has absorbed the largest share of the EU budget, amounting to 75 percent of the total budget in 1975, falling to 50 percent of the budget by 1993. The FEOGA-Garantía, a program to guarantee a minimum income to farmers, accounts for about 90 percent of the total going to agricultural policies, leaving a much smaller amount for the FEOGA-Orientación program, which is a program intended to improve farming structures and infrastructure.

The purpose of the primary Social Policy program, the FSE, is to educate and train workers, particularly young and long-term unemployed members of the labor force. The training is expected to improve the chances of obtaining employment and of switching employment from declining industries to growing industries.

The Regional Policy, with its primary program FEDER, is directed towards reducing regional differences through the support of public and private investment. Its importance has increased over time, going through several reforms since its inception in 1975.

The structural funds from the above three policies, FEOGA-Orientación, FSE and FEDER, are distributed to regions according to six objectives as specified in the policy directives of the European Union. Three of these objectives are specifically aimed at regions: i) Objective 1, to promote the development and structural

adjustment of less developed regions; ii) Objective 2, to help regions affected by industrial decline; and iii) Objective 5b, to help the development of agricultural areas. Three additional objectives do not have a regional focus: i) Objective 3, to fight long-term unemployment; ii) Objective 4, to help youth find jobs; and iii) Objective 5a, to help renew agricultural structures.

In 1993 a new program was created. The purpose of the Cohesion Fund is to finance environmental programs and trans-european network investment in countries with income per capita below 90 percent of the EU average. This fund is still small compared to the other funds and is not analyzed here. In our analysis we focus on the Spanish FCI program and on the three EU programs whose purpose is to stimulate economic activity through structural reform of the labor market and through regional economic development projects.

Tables 1 and 2 display cumulative amounts received by each community from each of the fund programs from the first year of the program to the most recent year for which data are available. Table 1 displays these figures on a per capita basis, while Table 2 displays the figures as a percentage of GDP. All figures are in real 1980 pesetas. The final columns of the tables display the totals for two aggregates, one being an aggregate over the EU structural funds only, and the other includes the EU structural funds as well as the FCI. [3]

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[3]Note that because of the way the aggregate figures have been calculated, we cannot provide a total for all structural funds as a percentage of GDP because of the different time periods of the EU funds and the FCI.

On average, the largest of the structural funds (structural funds consist of all funds except the income support program FEOGA-Garantía) was the FCI. However, the FCI had been in operation since 1982, four years before Spain's entry to the European Union. The FEDER program was also relatively important, while the FSE fund and particularly the FEOGA-Orientación were relatively small. It is important to note that the aggregate intervention represented by the various funds is generally quite small. The total of all structural funds over the period 1982-1993 for Spain was 50,841 pesetas per person, compared with GDP per capita in a single year, 1991, of 501,806 pesetas (in 1980 pesetas). Total EU structural funds as a share of GDP over the period 1986-1991 for Spain was 0.46 percent, while FCI funds over the 1982-91 period were 0.63 percent of GDP. This is in comparison with total private (public) investment as a share of GDP at 17.9 (4.5) percent in 1991.

That being said, the funds were somewhat important for many of the poorer regions. Using total structural funds per capita (the final column of table 1) the top six recipients were Andalucía, Canarias, Castilla-León, Castilla-La Mancha, Extremadura and Galicia, all of which received more than 70,000 pesetas per capita. By comparison, the average real disposable income per capita for these regions in 1990 was approximately 330,000 pesetas (in 1980 pesetas).

As can be seen by examining the coefficients of variation displayed in the last rows of tables 1 and 2, there was significant variability across the seventeen regions in the amounts received under the four structural funds. The most variable of the structural funds was the FEDER followed by the FCI. Because these two funds are

the largest, the fact that they vary significantly across regions implies that there is a potential for differential impacts.

Three regions, Extremadura, Castilla-León, and Castilla-La Mancha, were top recipients for each of the four structural funds. Extremadura, in particular, received significantly more than the Spanish average from all four structural funds. Other regions that were consistently above average recipients of funds included Andalucía and Canarias (for FEDER, FCI and FSE) and Asturias (for FEDER, FSE, and FEOGA-Orientación). In addition, Galicia received a relatively large aggregate amount under the FCI program.

Regions that were consistently below average in terms of receipts under each of the four structural funds were Baleares, Cataluña, and Madrid. Four additional regions, C. Valenciana, Navarra, País Vasco, and La Rioja, received relatively small amounts under the two biggest structural funds, FEDER and FCI. Using the last column of figures from table 1, five regions, Baleares, Cataluña, Madrid, Navarra, and La Rioja, received less than 30,000 pesetas per capita during the period.

To summarize, in general the recipient regions consisted of Andalucía, Asturias, Canarias, Castilla-La Mancha, Castilla-León, Extremadura and Galicia. The non-recipient regions consisted of Baleares, Cataluña, C. Valenciana, La Rioja, Madrid, Navarra, and País Vasco. As we will see below, the recipient regions tended to be poorer and less developed than the non-recipient regions. In fact, the correlation between total funds per capita (the final column of table 1) and 1981 GDP per capita is -0.9.

Figure 1 illustrates the evolution over time of the average per capita amounts for Spain for the four structural funds from 1982 to 1993. The FCI declined in importance over time especially during the 1982-87 period, and again in the early 1990s. FEDER increased steadily until the early 1990s when it reached a plateau and then declined. FSE and FEOGA-Orientación displayed a slight upward trend over the period. Until 1991, the average FCI grant per capita was larger than the average FEDER grant per capita. A major change in the FCI program in 1991, notably the fact that several richer regions no longer received monies under this program, caused the average FCI to fall dramatically, so that for 1992 and 1993, the average FEDER grant per capita was nearly double the average FCI grant per capita, which was very similar in size to the FSE and FEOGA-Orientación grants.

II. Economic Performance of the Regions of Spain 1964-1994

The seventeen regions of Spain, the so called Comunidades Autónomas, are quite different in their economic and social characteristics. For example, income per capita varies significantly among the regions. Although differences across the regions have diminished over time, especially during the 1960s and 1970s (see Dolado et al., 1994 and Mas et al., 1994a for studies of convergence over time), the rank order of the regions has remained almost unchanged over the period we consider.

To describe the economies of the regions and their evolutions, we present several statistics for six years spanning a 30-year time period: the starting and ending points of our sample (1964 and 1994, typically), and four intermediate years, the peak before the first oil crisis affected the Spanish economy (1973), the year before the

Spanish interregional transfer program began (1981), the trough before the latest expansion (1985), and the end of the most recent expansion (1991). All peseta-denominated figures are in real 1980 pesetas.

GDP, Employment, and Industrial Mix

Table 3 presents GDP per capita for 1964, 1973, 1981, 1985, 1991 and 1994 expressed as indices relative to Spain (set at 100). The ranking of the regions has not changed much over time; regions at the top and bottom of the distribution have remained in their positions with few changes. A clear exception is País Vasco, the richest region in 1964, with GDP per capita 62 percent above the Spanish average. It then suffered a big loss and by 1981 was only 10 percent above average, remaining in that position for the remainder of the period, and far below the top regions. Cantabria suffered a similar reversal of fortune, being among the top five in 1964, but with values below average from 1981 on. On the other end, Baleares witnessed an improvement in relative standing, ending the period at the top position, significantly better off than Madrid, the next region in ranking.

Baleares, Madrid and Cataluña were the richest regions at the end of the sample, and they were among the top four at all times. Aragón, Navarra, La Rioja, and País Vasco comprised the next richest group in 1994 and generally throughout the 30-year period. Extremadura was consistently the poorest region, followed with some distance by Andalucía, Castilla-León, Castilla-La Mancha, Galicia and Murcia, with slight changes in ordering over time. The poorest regions in 1981, just prior to the implementation of the Spanish interregional grants program, were Extremadura,

Andalucía, Castilla-La Mancha, and Galicia; with Castilla-León and Murcia following at some distance.

Table 4 presents average annual growth rates of real GDP per capita. The average growth rate for Spain varied considerably from one period to the next. The 1964-73 period was a period of fast growth, with an improvement in GDP per capita of over five percent per year. Beginning in mid-1970 the growth rate was slow for more than a decade until the big expansion of the second part of the 1980s when the growth rate was around four percent before declining sharply in the most recent recession. The fast growth of GDP per capita from 1964 to 1973 was reflected in a large increase in labor productivity. The period of moderate growth of GDP per capita from 1973 to 1985 was a period of large employment losses that resulted in an unemployment rate of almost 22 percent in 1985.

The average growth rate of GDP per capita for Spain was not equally distributed among regions. Some relatively poor regions grew quite fast, as was the case of Extremadura, Castilla-La Mancha and Galicia. The three regions in the North Cantabric corner, País Vasco, Cantabria and Asturias, had below average growth rates in almost all periods, which reflects their decline in the rankings for many measures. The rich regions had irregular behavior, with high growth in some periods and low in others; the latest recession affected the rich regions in a very uneven way as witnessed by Cataluña and Madrid having experienced negative growth rates while Baleares experienced an increase in GDP far above the average. These patterns are consistent with a narrowing of the differences among the regions over time in GDP per capita.

While in 1964 the richest region, País Vasco, had per capita GDP three times that of Extremadura, by 1994 the richest region, Baleares, was a bit more than twice as rich as Extremadura.

The Spanish evolution of employment parallels the evolution of GDP for the most part but not for all regions nor all periods. The period of 1964-1973, a period of high growth of GDP per capita, exhibited moderate employment growth in the country (see the first row of table 5). During the long recession of 1973-1981, employment losses occurred. The 1985-91 expansionary period was accompanied by a large increase in employment. The employment losses and gains were unevenly distributed among regions. Overall, regions that experienced slow growth in GDP tended to have low or negative employment growth rates, but the opposite is not always true. For example, Extremadura, with high GDP growth rates, performed relatively poorly in terms of employment growth. Cataluña and Madrid tended to do relatively well in terms of employment growth in expansionary periods and poorly in recessionary periods.

Examining the unemployment rates of the regions (table 6), we find that Andalucía, Canarias and Extremadura experienced high rates of unemployment for all periods, while other regions showed different relative values depending on the period. Cataluña and Madrid, for example, suffered high rates at the 1985 trough, but relatively low rates at the end of the most recent expansion in 1991. We note that the average unemployment rate for Spain was very different at the beginning (2.06 percent in 1964) compared to the end of the period (16.32 percent in 1991), with large

differences across regions throughout the period.

In recent years these high unemployment rates were not associated with high rates of migration out of regions experiencing high unemployment into regions with low levels. This change of migration patterns is described in Rodenas (1994) who found that for the period 1962-73 there were some regions from which people primarily out-migrated, including Andalucía, Castilla-La Mancha, Castilla-León and Extremadura, while there were other regions to which people primarily in-migrated, including Cataluña, Madrid, C. Valenciana and País Vasco. During this period, people generally migrated from poor agricultural regions to rich, industrialized regions. Between the mid 1970s and mid 1980s the migration flows diminished significantly, but there was also a change in patterns in that most regions experienced both inflows and outflows, resulting in very small net migration flows. Gross migration flows picked up again in the late 1980s, but in general the new pattern persisted so that regions with important gross flows, such as Andalucía, Cataluña, Castilla-León, and Madrid, had small net migration flows. An exception to this pattern was Castilla-La Mancha, which experienced large net outflows in 1988-90. The only region that consistently lost population through migration was País Vasco. This is consistent with the general decline of the economy of this region, which may have been reinforced by its political situation.

Table 7 summarizes the industrial mix of the regions and its evolution over time by displaying shares of GDP for four major industries for each region in 1964, 1981 and 1991. Overall the industrial mix of Spain evolved over time like in many

other countries; the agricultural sector declined by 1991 to less than one third of its value in 1964, manufacturing declined by 30 percent over the same period, and services increased its share by nearly 50 percent. A somewhat surprising fact is the relatively large increase in construction in recent years, which may be related to the large amount of public construction that occurred in the late 1980s. Differences across regions remain over time as can be seen by the coefficients of variation. The agricultural sector is relatively large in Extremadura, Andalucía, Castilla-La Mancha, Murcia, La Rioja, Galicia and Castilla-León, and all except La Rioja are among the poorest regions. It is interesting to note that with the exception of La Rioja, these are also the regions with the highest shares of GDP in the construction industry, probably due to large amounts of public investment carried on during the period. Although the services sector has become more prevalent for all regions, there are three regions that stand out in this respect: Baleares and Canarias, two tourism regions, and Madrid, where the central government administration is located. Finally, three regions remain dominant in manufacturing (País Vasco, Cataluña and Asturias), one region that historically was industrial has become more services oriented (Cantabria), and two regions that historically have been agricultural have become more reliant on the manufacturing sector (La Rioja and Navarra).

Public Capital

A primary aim of the various structural grants is to finance investment in public capital to ensure that basic infrastructure for economic activity is available. As can be seen from table 8, public capital has increased significantly over the period

analyzed; it was barely 20 percent of GDP in 1964 and by 1991 it was nearly 40 percent. Differences across regions were quite large and remained so over time. It is in general true for all times that poor regions tended to have larger shares of public capital relative to GDP compared to rich regions, with a few exceptions (Navarra and La Rioja). In fact La Rioja changed its position quite dramatically as a result of an extremely high public investment project in roads in 1977 that triggered a jump in public capital in that year and put the region at the top or second to the top from then on. Another change over time is that of País Vasco, with a very low ratio in 1964 that improved in the second part of the period at the same time that its GDP per capita fell.

If we interpret the above results in terms of average productivity of public capital, i.e., reversing the ratios of table 8 to be GDP per unit of public capital, we find that most of the poor regions had low rates of average productivity of public capital while the rich regions had high ones. One could argue based on these figures that more investment in public capital in some rich regions might have a high rate of return.

It is not by chance that we observe these facts about the relationship between public capital and GDP because a goal behind the public investment intervention policy has been to help poor regions to develop and to reduce regional differences in economic well being. Part of this public investment policy is very directly related to the grant policy that we described in the previous section. The question that remains is whether this public intervention has been effective in triggering new economic activity that would help poor regions to catch up to rich regions. To that question we

turn in the next section.

III. Analysis of the Effect of Regional Grants on Regional Economic Performance

To assess the impact of the grants on regional economic development, we compare the economic performance of two groups of regions before and after the grant policy intervention. One group consists of regions that are consistently above average on various economic indicators and below average in terms of receipt of grant monies from the central government of Spain and the European Union. We label this group the "rich" group, and it consists of Baleares, Madrid, Cataluña, La Rioja and Navarra. The other group consists of regions that are consistently below average on most of the economic indicators and above average in terms of receipt of grant monies. We label this group the "poor" group, which consists of Extremadura, Castilla-La Mancha, Castilla-León, Galicia, and Andalucía.

The two time periods we examine are 1977-1981 and 1989-1992 (with slight variations on these periods depending on data availability for certain variables). The earlier time period ends in the year before the imposition of the FCI grant in Spain, while the latter period is as far into the period of both Spanish and European Union grant intervention as the data permit. We choose roughly comparable lengths for the two time periods. In results not presented here but discussed below, we vary the definitions of the time periods to test for robustness of the results.

Our approach, then, is a differences-in-differences approach where we examine differences between the two groups in the differences across the two time

periods for each group. While we clearly do not have a natural experiment because regions are not assigned randomly to be recipients or non-recipients of the grants, the differences-in-differences approach enables us to control, if imperfectly, for other factors affecting the different groups, regions and time periods. If the grants are effective, we would expect to see a larger improvement in economic well-being between the two periods for the poor (recipient) group relative to the rich (non-recipient) group.

In the tables that follow we present results for six different measures of economic well-being or economic activity. We are interested in assessing whether the private economy has reacted to the public intervention, in other words, whether the regional grant policies have impacted aggregate measures of economic activity including private investment. We examine six measures: 1) annual growth rate of real GDP, 2) real GDP per capita, 3) unemployment rate, 4) annual growth rate of employment, 5) annual growth rate of real private non-residential investment, and 6) real private non-residential investment per capita. The private investment data have only recently become available, and, as far as we know, our study is the first to utilize these data to evaluate regional grant policies. For each variable we present two pieces of evidence. The first piece is a simple comparison of averages (over time and across members of a group) for the rich and poor groups for the two time periods. The second set of results consists of a regression with annual observations by region estimated using OLS where the independent variables include dummy variables for each region and each year in the sample, and a dummy "intervention" variable that

takes a value of one for poor regions in the second time period only, and zero otherwise. These two pieces of evidence are quite similar to one another. The simple comparison of averages gives information about levels and the basic intuition. The regression analysis allows for more precise controls for time periods and region-specific effects.

This approach and these results say very little about whether the grants have caused changes in the economic performance of the regions. A major difficulty we face is that the period we examine was a period of massive changes in the economy, policy and politics of Spain and its regions. It would be exceedingly difficult if not impossible to attempt to model all of the relevant processes and causes of regional economic growth. What our approach does is offer a simple comparison of regional outcomes before and after the imposition of the grants, controlling for factors common to all regions in different years and for time-invariant factors specific to individual regions.   In table 9 we find evidence that the average annual growth rate of real GDP improved for the poor group and decreased for the rich group between the two time periods, and that the difference in these trends is statistically significant (t-statistic of 2.3 in panel A and 1.8 in panel B). Thus, without attributing causality, there appears to be a correlation between the imposition and receipt of the grants, and an improvement in growth rates of real GDP. However, the results for this variable are not robust to changes in the definition of the time periods. For example, when the time periods are 1973-1981 and 1985-1994 the difference between the trends for the two groups is not statistically significant.

In table 10 we examine real GDP per capita and find evidence that appears in conflict with the findings from table 9. The results in table 10 indicate that while real GDP per capita increased for both groups between the two time periods, the increase was greater for the rich group, and the difference in trends between the two groups is statistically significant (t-statistic of 3.5 in panel A and 6.4 in panel B). When viewed in percentage terms, the results in table 10 can be reconciled with the unreported results for annual growth rate of real GDP. Using the figures in panel A, the difference between increases in per capita GDP for the two groups is not important; both groups experienced increases of about 40 percent between the two time periods.

The results in table 11 indicate that the unemployment rate increased for both groups between the two time periods, but that the increase was greater for the poor group with the difference between the two groups being statistically significant (t-statistic of 3.8 in panel A and 8.4 in panel B). Thus, the imposition of the grant programs appears to be associated with a deterioration in the employment situation of the poor group relative to the rich group as evidenced by a larger increase in the level of unemployment for the poor relative to the rich. These results for unemployment rates are robust to changes in the time periods analyzed. In panel B it is interesting to see that relative to the omitted region of Andalucía all regions had lower unemployment rates on average. Also, except for 1988, the average unemployment rate was lower in every year relative to the omitted year of 1992.

In the results displayed in table 12 we find no evidence that the imposition of the grant programs is associated with improvements in employment growth rates. The

average annual growth rate of employment increased for both groups between the two time periods (actually, the growth rates changed from being negative in the earlier period to being positive in the latter period), and there is no statistical difference between the trends for the two groups (t-statistic of 0.7). We find that the results displayed here are robust to changes in the time periods analyzed.

Table 13 presents the results for the growth rate of real private non-residential investment. For both groups the results indicate that the average annual growth rate of private investment increased substantially, and the differences between the groups in these trends is not statistically significant (t-statistic of 0.9). Thus, the imposition of the grants does not appear to be correlated with faster growth in private non-residential investment as both groups - both the rich, non-recipient group and the poor, recipient group - experienced statistically similar improvements in private investment growth rates. These results are reasonably robust to changes in the time periods analyzed, although in some specifications the poor are worse off relative to the rich by this measure.

The results we obtain when we examine private non-residential investment per capita differ slightly from the ones we obtain when analyzing the growth rate of private investment. In table 14, we find that the rich group experienced a larger increase in private investment per capita between the two time periods relative to the poor group, that the difference is important in percentage terms as the rich group average increased 60 percent between the two time periods while the poor group average increased only 27 percent, and that the difference in trends between the two

groups is statistically significant (t-statistic of 4.2 in panel A and 7.2 in panel B).

These results, which are robust to changes in the time periods analyzed, are the

opposite of what we would expect if the grant programs had had a positive influence

on private investment decisions.

One difficulty we encounter in trying to uncover an effect of the grants on the

economies of the poor regions is that, with the limited data available, it is difficult to

untangle the effect of being a recipient region with the effect of being a poor region.

In an effort to control for the effect of being poor we re-estimate the equations

underlying the simple differences-in-differences results of panel A of tables 9-14 by

including a lagged value of the dependent variable. The dependent variable in these

simple equations is the change in the average value of the variable between the two

periods (pre-grants-policy period and post-grants-policy period).   The lagged

independent variable is the change in the average value of the variable between the

pre-grants-policy period and an earlier period. The results of this estimation, as well

as the regressions underlying panel A of tables 9-14, are reported in table 15. [4]

We find that controlling for a prior period in this way, essentially controlling

for persistence over time, alters the results negligibly. The one case where inclusion

of the lagged variable makes a difference is the growth rate of employment. The

intervention variable becomes statistically significant when the lagged variable is

included. The sign of the intervention variable is negative indicating that poor regions

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are worse off compared to rich regions after the intervention. This result is consistent with the unemployment rate results displayed in table 11 and column (3) of table 15.

Our results for aggregate measures of the regional economies may well mask important differences at the industry level. For three of our variables, annual growth rates of real GDP, employment, and real private non-residential investment, we estimate industry-specific equations. For annual growth of real GDP and of real private non-residential investment, the industry-specific results essentially confirm the aggregate results of tables 9 and 13; there is no discernible effect of the grants policy on investment behavior, and there is either no effect or a marginally significant positive effect of the grants policy on GDP. The results for the simple differences-in-differences form of the equation for GDP and employment are presented in table 16. The results for annual growth of employment generally support the aggregate results of table 12 except for the services industry, where we find that the intervention has a positive significant effect on services employment growth. Unfortunately, with the available data, we cannot separate private from public employment in the services sector, and this distinction may be of great relevance to understanding the positive effect for the services sector. The intervention period coincides with a time of great expansion of the public sector including public services in Spain, which may have been more important for the poor regions.

To summarize, except for annual growth rate of real GDP, not one of the sets of results for the six variables supports the notion that the economies of the poor regions have been differentially assisted by the grant programs. And even the results

for annual growth rate of real GDP are not robust to changes in the time period analyzed. In fact, the evidence suggests that when we compare a period just before the imposition of the grants to a period well into the receipt of monies from the grants the position of the rich group was improved relative to the position of the poor group on three measures - real GDP per capita, unemployment rate, and real private non-residential investment per capita.

Our findings are in line with a recent study of specific projects funded by the EU grants (FEDEA, 1994). In an empirical analysis of fifteen regions from 1980 to 1991, the authors estimate equations with value added as the dependent variable and public investment funded by both the FCI and FEDER as independent variables. They find that the public investment variables are not significant determinants of value added in the regions.

Both the Spanish central government grants and the European Union grants are directed in large part towards increasing the amount of public infrastructure in the poorer regions. In table 17 we examine whether differences across poor and rich regions in investment in public infrastructure reflect these redistributive policies. In panel A we see that the growth rate of real public investment increased dramatically for both groups between the two periods, but by much more for the rich group, although the difference between the two groups is not significant. In panel B the results indicate that real public investment per capita was marginally significantly higher for the poor group in the latter period relative to the rich group. In fact in

percentage terms the poor group figure increased by 200 percent, while the level for the rich group increased by less than 40 percent. Thus, it appears that the imposition of the grants may be correlated with changes in levels of investment in public capital across the two groups, where the changes have favored the poor group. Over a longer horizon these public capital differences may manifest themselves in relative improvements in economic development in the poor regions. However, studies of the productivity of public capital appear to indicate that public capital investment is not a particularly effective tool for regional economic development. [5]

Conclusion

Regional redistribution is an important part of the policy of the European Union and the Spanish government. In this study we find that these policies have not been effective at stimulating private investment or improving the overall economies of the poorer regions. The lack of impact may be attributable to several factors. First, the policies were only implemented in recent years (1982 for the Spanish FCI and 1986 for the EU grants) and these sorts of policies directed at infrastructure improvement and structural change of the labor market may take time to have an impact. Second, the amounts of the grants are not large even for the very poor regions. It just may be that the interventions were too weak to have had an effect. Third, while we present no evidence on how the funds are used, it seems clear that certain uses are likely to be more productive than others, and it is not clear that the

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[5]See Garcia-Milà, McGuire and Porter (1996) and Holtz-Eakin (1994).

monies are well targeted to the most productive investments. *The Economist* has argued that there are likely to be inefficiencies in the EU structural grant process and in the management of the program.[6] In a FEDEA (1994) study evaluating approximately 350 projects funded by FEDER between 1989 and 1993, the authors find that, while there is room for improvement, the projects are generally well-managed; the problem may not be so much mismanagement of funds, but rather lack of targeting or general planning of the projects, which are sometimes considered in isolation, instead of in an overall plan for regional development. Fourth, the period we examine has been a tumultuous one for Spain with numerous changes in the policy, politics and economies of the regions, rendering it difficult to detect an effect of the regional grant policies.

An alternative explanation for our findings is that regional development policies, at least the kind described here, are doomed to fail. The persistence of differential economic performances across regions over time, as evidenced by Blanchard and Katz (1992), for example, whether regional policies exist or not, is prima-facie evidence that factors, which are not well understood and non-obvious, are at work. Without a better understanding of how regions develop and how the fates of regions are determined, we cannot expect government intervention to be effective.

Appendix: Data Sources

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[6]See "Fund of disappointment" page 46 of the January 27, 1996 issue of *The Economist*.

The data used in this paper come from several sources that we detail below.

"Renta Nacional de España y su distribución provincial: serie homogénea 1955-91", *Banco Bilbao Vizcaya* (BBV). This is the source for regional GDP, both total and by industries, and for disposable income. The data are biannual.

"Contabilidad Regional de España", *Instituto Nacional de Estadística*. This is the source for annual GDP data from 1980-91.

"Capital humano 1964-1992", *Instituto Valenciano de Investigaciones Económicas* (IVIE) and *Fundación Bancaixa*. Employment, labor force and population data up to 1992 were obtained from this source.

"Estimación del crecimiento del PIB por Comunidades Autónomas. Año 1994", *Papeles de Economía Española*, No. 64, 1995, anexo 11 Junio 1995. Source for GDP, disposable income and population for 1994. This series follows the same methodology as the BBV. BBV has the advantage that the data series begins at a much earlier date, but unfortunately the series is updated with a long delay. For this reason we use a different source for 1994 data.

"El stock capital en España y sus Comunidades Autónomas", *Fundación BBV*. Provides data for private and public capital and investment for the period 1964-1991. *Annuario Estadístico del Instituto Nacional de Estadística* (INE) is the source for migration data for the period 1978 to 1993.

"Fondos Comunitarios en España: regionalización y análisis de su incidencia", by M.D. Correa, A. Fanlo, J. Manzanedo and S. Santillán, Documento de Trabajo D-95002, *Ministerio de Economía y Hacienda*. This is the source for the European funds for 1986-1993 by region.

For the Fondo de Compensación Interterritorial (the Spanish FCI) we have used four sources of data:
- "Dessarrollo del proceso autonómico en el perído 1986-89", *Ministerio de Economía y Hacienda*
- "Informe sobre financiación de las Comunidades Autónomas en 1993", *Ministerio de Economía y Hacienda*
- "Finançament de la Generalitat de Catalunya, 1980-91", *Institut d'Estadítica de Catalunya*
- "Informe económico financiero de las Administraciones Territoriales en 1992", *Ministerio para las Administraciones Públicas*, Colección Memorias y Estadísticas, Madrid, 1993.

References

Barro, R., and X. Sala-i-Martín, 1991, "Convergence Across States and Regions", *Brookings Papers on Economic Activity*, Vol. 1, pp. 107-82.

Blanchard, Olivier Jean and Lawrence F. Katz, 1992, "Regional Evolutions", *Brookings Papers on Economic Activity*, Vol. 1, pp. 1-75.

Canova, F., and A. Marcet, 1995, "The Poor Stay Poor: Non-convergence Across Countries and Regions", Universitat Pompeu Fabra Working Paper No. 137.

De la Fuente, A., and X. Vives, 1995, "Regional Policy and Spain", *Economic Policy*, pp. 13-51.

Dolado, J.J., J.M. González-Páramo, and J.M. Roldán, 1994, "Convergencia Económica entre las provincias españolas: evidencia empírica (1955-89)", *Moneda y Crédito*, Vol. 198, pp. 81-120.

FEDEA (Fundacion para Estudios de Economia Aplicada), Julio 1994, "Evaluacion del Marco de Apoyo Comunitario 1989-93", FEDEA, Madrid.

Garcia-Milà, T. and R. Marimón, 1996, "Integración regional e inversión pública en España", in *La economía española: una visión diferente*, edited by R. Marimón, published by Antoni Bosch, Barcelona, pp. 197-256.

Garcia-Milà, T. and T.J. McGuire, 1991, "The Effects of Central Government Financing on Regional Government Expenditures in Spain", in *Public Finance with Several Levels of Government*, edited by Rémy Prud'homme, The Hague, Netherlands: Foundation Journal Public Finance, pp. 223-234.

Garcia-Milà, T. and T.J. McGuire, 1993, "Evaluación del Régimen de Financiación de las Comunidades Autónomas a Través de un Análisis del Gasto y la Renta", *Revista de Economía Aplicada*, Vol. 1, No. 3, pp. 5-26.

Garcia-Milà, T., T.J. McGuire, and R.H. Porter, 1996, "The Effect of Public Capital in State-level Production Functions Reconsidered", *The Review of Economics and Statistics*, pp. 177-80.

Holtz-Eakin, Douglas, 1994, "Public-Sector Capital and the Productivity Puzzle", *The Review of Economics and Statistics*, Vol. 76, pp. 12-21.

Marimón, R., 1996, "Introducción", in *La economía española: una visión diferente*, edited by R. Marimón, published by Antoni Bosch, Barcelona, pp. 9-43.

Mas, M., J. Maudos, F. Perez, and E. Uriel, 1994a, "Disparidades regionales y convergencia en las Comunidades Autónomas", *Revista de Economía Aplicada*, Vol. II, No. 4, pp. 129-48.

Mas, M., J. Maudos, F. Perez, and E. Uriel, 1994b, "Capital público y productividad de las regiones españolas", *Moneda y Crédito*, Vol. 198, pp. 163-92.

Rodenas, C., 1994, "Migraciones interregionales en España, 1960-1989", *Revista de Economía Aplicada*, Vol. II, No. 4, pp. 5-36.

Table 1

FUNDS PER CAPITA

	FEDER	FCI	FSE	FEOGA Or	FEOGA Ga	Total EU structural funds	Total structural funds
ANDALUCIA	17,966	47,187	7,567	2,487	43,410	28,020	75,207
ARAGON	9,642	19,599	4,829	7,596	52,041	22,067	41,666
ASTURIAS	22,440	23,039	6,402	4,301	5,413	33,143	56,182
BALEARES	1,559	13,936	3,490	1,708	5,212	6,757	20,693
CANARIAS	19,787	45,102	6,809	3,305	5,222	29,901	75,004
CANTABRIA	9,151	17,753	4,852	4,881	12,068	18,884	36,637
CASTILLA-LEON	20,536	38,204	6,795	6,625	44,744	33,956	72,160
CASTILLA-LA MANCHA	28,812	49,227	5,754	6,826	80,120	41,392	90,619
CATALUÑA	3,916	15,857	4,845	1,057	10,414	9,818	25,675
C. VALENCIANA	7,841	18,365	4,511	1,958	7,595	14,310	32,675
EXTREMADURA	28,420	77,912	8,811	6,354	79,333	43,586	121,498
GALICIA	14,044	46,403	5,637	6,073	6,934	25,755	72,158
MADRID	1,562	12,088	4,276	0,282	1,756	6,120	18,208
MURCIA	13,639	25,349	6,351	2,990	26,750	22,981	48,330
NAVARRA	4,320	11,764	5,633	5,430	35,587	15,383	27,148
PAIS VASCO	7,968	19,798	6,411	2,689	6,649	17,068	36,866
LA RIOJA	3,453	13,695	4,230	4,011	34,907	11,694	25,389
SPAIN	11,975	29,970	5,795	3,101	23,609	20,871	50,841
Coefficient of Variation[*]	0.71	0.63	0.24	0.55	0.96		

These figures are the sum from 1986 to 1993 of the annual per capita values, except for FCI where the sample is from 1982 to 1993, EU structural funds include FEDER, FSE and FEOGA Orientacion; Structural funds are the EU structural funds plus FCI.

Unit: pesetas of 1980 per person.
[*] for the 17 AC's

Table 2

FUNDS AS A PERCENTAGE OF G.D.P.

	FEDER	FCI	FSE	FEOGA Or	FEOGA Ga	Total EU structural funds
ANDALUCIA	0.59%	1.26%	0.25%	0.06%	1.37%	0.89%
ARAGON	0.24%	0.41%	0.10%	0.09%	0.95%	0.43%
ASTURIAS	0.72%	0.52%	0.15%	0.10%	0.15%	0.97%
BALEARES	0.02%	0.25%	0.06%	0.02%	0.10%	0.10%
CANARIAS	0.35%	0.95%	0.17%	0.05%	0.00%	0.57%
CANTABRIA	0.26%	0.39%	0.10%	0.09%	0.33%	0.45%
CASTILLA-LEON	0.56%	0.90%	0.20%	0.13%	1.12%	0.89%
CASTILLA-LA MANCHA	0.89%	1.22%	0.18%	0.17%	1.86%	1.24%
CATALUÑA	0.06%	0.31%	0.09%	0.01%	0.21%	0.17%
C. VALENCIANA	0.14%	0.39%	0.10%	0.04%	0.17%	0.28%
EXTREMADURA	0.83%	2.55%	0.33%	0.19%	2.74%	1.35%
GALICIA	0.27%	1.16%	0.17%	0.13%	0.23%	0.57%
MADRID	0.03%	0.23%	0.09%	0.00%	0.03%	0.12%
MURCIA	0.37%	0.54%	0.17%	0.07%	0.62%	0.61%
NAVARRA	0.04%	0.22%	0.12%	0.07%	0.63%	0.23%
PAIS VASCO	0.08%	0.36%	0.11%	0.05%	0.14%	0.24%
LA RIOJA	0.05%	0.23%	0.07%	0.05%	0.69%	0.16%
SPAIN	0.27%	0.63%	0.14%	0.06%	0.53%	0.46%
Coefficient of Variation[*]	0.91	0.86	0.48	0.67	1.12	

These figures are the share of the sum of the annual data for each fund over the sum of the annual G.D.P. for the same sample as the fund.

EU structural funds include FEDER, FSE and FEOGA Orientacion.

Unit: percentage of funds over G.D.P., both measured in pesetas of 1980.

Sample: From 1986 to 1991 except for FCI which is from 1982 to 1991.

[*] for the 17 AC's

Table 3

REAL G.D.P. PER CAPITA

	1964	1973	1981	1985	1991	1994
SPAIN	100	100	100	100	100	100
ANDALUCIA	65.55	72.68	73.35	71.37	71.77	71.68
ARAGON	104.65	102.52	103.98	109.96	108.76	108.31
ASTURIAS	104.93	106.95	99.39	95.43	87.60	87.43
BALEARES	130.36	149.20	130.79	149.96	142.22	157.75
CANARIAS	75.70	91.01	96.26	95.07	96.26	103.95
CANTABRIA	127.73	106.20	98.74	97.79	91.12	88.03
CASTILLA-LEON	87.64	82.96	84.46	89.17	87.47	90.15
CASTILLA-LA MANCHA	66.97	77.83	75.78	76.97	82.95	82.31
CATALUÑA	149.86	130.20	125.81	123.35	125.84	122.93
C. VALENCIANA	101.67	103.90	103.60	104.19	102.00	101.12
EXTREMADURA	52.83	59.25	61.58	65.92	68.17	68.76
GALICIA	67.38	70.05	79.65	80.51	81.49	83.35
MADRID	147.64	126.73	132.20	130.67	129.57	127.93
MURCIA	72.44	83.84	85.07	83.89	82.58	81.33
NAVARRA	123.22	110.97	107.96	109.26	115.80	117.01
PAIS VASCO	162.43	135.33	110.38	110.74	110.01	109.42
LA RIOJA	117.12	103.44	107.14	108.93	107.49	109.32
SPAIN	224,502	352,759	396,207	423,766	536,695	542,362

Table 4

AVERAGE ANNUAL GROWTH OF REAL G.D.P. PER CAPITA

	1964-1973	1973-1981	1981-1985	1985-1991	1991-1994
SPAIN	5.15%	1.46%	1.70%	4.02%	0.35%
ANDALUCIA	6.36%	1.58%	1.00%	4.11%	0.31%
ARAGON	4.91%	1.64%	3.12%	3.83%	0.21%
ASTURIAS	5.37%	0.54%	0.67%	2.54%	0.29%
BALEARES	6.74%	-0.19%	5.23%	3.10%	3.88%
CANARIAS	7.32%	2.18%	1.38%	4.23%	2.96%
CANTABRIA	3.01%	0.54%	1.45%	2.80%	-0.80%
CASTILLA-LEON	4.51%	1.69%	3.09%	3.68%	1.36%
CASTILLA-LA MANCHA	6.92%	1.12%	2.09%	5.32%	0.09%
CATALUÑA	3.52%	1.03%	1.20%	4.36%	-0.43%
C. VALENCIANA	5.40%	1.42%	1.84%	3.65%	0.06%
EXTREMADURA	6.50%	1.95%	3.45%	4.60%	0.64%
GALICIA	5.60%	3.10%	1.97%	4.22%	1.11%
MADRID	3.38%	2.00%	1.40%	3.87%	-0.07%
MURCIA	6.87%	1.65%	1.34%	3.74%	-0.16%
NAVARRA	3.93%	1.11%	2.00%	5.03%	0.70%

PAIS VASCO	3.04%	-1.09%	1.78%	3.90%	0.17%
LA RIOJA	3.71%	1.91%	2.12%	3.79%	0.92%

Table 5

AVERAGE ANNUAL GROWTH OF EMPLOYMENT

	1964-1973	1973-1981	1981-1985	1985-1991
SPAIN	0.98%	-1.72%	-1.28%	2.83%
ANDALUCIA	0.16%	-2.91%	-1.00%	3.75%
ARAGON	-0.31%	-1.39%	-1.71%	2.47%
ASTURIAS	0.22%	-1.55%	-2.00%	0.32%
BALEARES	1.30%	-0.37%	0.13%	3.18%
CANARIAS	2.00%	-0.39%	-0.54%	2.98%
CANTABRIA	0.14%	-1.05%	-1.78%	0.25%
CASTILLA-LEON	-1.27%	-1.27%	-2.20%	1.97%
CASTILLA-LA MANCHA	-1.10%	-2.97%	0.15%	2.14%
CATALUÑA	2.22%	-1.48%	-2.25%	4.32%
C. VALENCIANA	1.39%	-0.93%	-1.09%	3.12%
EXTREMADURA	-1.03%	-3.34%	-2.29%	2.61%
GALICIA	1.00%	-2.22%	-0.37%	-0.53%
MADRID	3.32%	-1.45%	-0.68%	3.70%
MURCIA	1.44%	-0.99%	-0.40%	3.03%
NAVARRA	0.46%	-0.99%	-0.83%	2.75%
PAIS VASCO	1.80%	-1.55%	-2.16%	2.55%
LA RIOJA	0.45%	-0.75%	-2.96%	3.08%

Table 6

UNEMPLOYMENT RATE

	1964	1973	1981	1985	1991
SPAIN	2.06%	2.47%	14.36%	21.64%	16.32%
ANDALUCIA	5.12%	5.60%	21.05%	29.63%	25.81%
ARAGON	0.48%	1.48%	11.77%	17.61%	9.90%
ASTURIAS	0.24%	1.01%	11.68%	18.42%	15.86%
BALEARES	2.40%	1.29%	9.78%	13.89%	9.94%
CANARIAS	2.68%	1.65%	16.56%	25.68%	24.48%
CANTABRIA	0.49%	1.42%	10.15%	15.54%	16.00%
CASTILLA-LEON	1.18%	1.82%	10.30%	18.05%	14.92%
CASTILLA-LA MANCHA	1.34%	2.86%	14.04%	16.56%	12.97%
CATALUÑA	1.33%	1.22%	15.32%	22.69%	12.28%
C. VALENCIANA	0.96%	1.30%	13.37%	20.76%	15.70%
EXTREMADURA	4.98%	4.99%	17.92%	27.29%	23.84%
GALICIA	1.90%	3.05	5.88%	12.81%	12.21%
MADRID	0.95%	1.66%	15.25%	22.10%	12.16%
MURCIA	4.47%	3.86%	12.73%	20.16%	18.13%
NAVARRA	1.12%	1.57%	12.98%	18.89%	10.60%

PAIS VASCO	0.40%	1.48%	16.16%	23.61%	18.52%
LA RIOJA	1.03%	0.66%	7.52%	17.36%	9.62%

Table 7

SHARE OF G.D.P. BY INDUSTRY

MANUFACTURING	AGRICULTURE			SERVICES			CONSTRUCTION					
	1964	1981	1991	1964	1981	1991	1964	1981	1991	1964	1981	1991
ANDALUCIA	23.77%	12.48%	10.46%	43.47%	59.70%	62.37%	6.96%	8.14%	11.28%	25.80%	19.68%	15.89%
ARAGON	23.56%	6.64%	6.42%	38.93%	56.22%	56.35%	6.76%	7.61%	8.36%	30.75%	29.53%	28.87%
ASTURIAS	14.62%	5.26%	3.60%	32.13%	49.00%	54.56%	6.72%	5.25%	9.37%	46.53%	40.49%	32.47%
BALEARES	14.14%	3.20%	1.94%	57.37%	76.51%	79.74%	7.69%	8.05%	8.25%	20.80%	12.25%	10.07%
CANARIAS	26.50%	7.00%	3.99%	46.40%	72.49%	76.84%	6.65%	9.95%	9.22%	20.45%	10.56%	9.95%
CANTABRIA	16.78%	7.95%	5.71%	34.35%	53.75%	60.78%	5.01%	5.91%	8.04%	43.86%	32.39%	25.47%
CASTILLA-LEON	30.94%	9.60%	8.68%	36.13%	54.38%	55.39%	5.61%	7.84%	9.56%	27.32%	28.19%	26.37%
CASTILLA LA MANCHA	38.58%	16.35%	11.14%	32.98%	49.69%	51.18%	4.39%	10.90%	12.62%	24.06%	23.06%	25.05%
CATALUÑA	7.92%	2.69%	1.92%	43.12%	56.92%	59.79%	6.83%	5.02%	8.04%	42.13%	35.37%	30.25%
C. VALENCIANA	21.43%	6.17%	4.31%	40.31%	58.02%	60.17%	6.24%	6.43%	8.29%	32.02%	29.38%	27.23%
EXTREMADURA	37.51%	17.06%	12.41%	37.96%	57.73%	57.16%	7.18%	10.21%	13.02%	17.35%	14.99%	17.41%
GALICIA	33.73%	12.83%	9.14%	35.60%	55.49%	57.62%	6.15%	8.96%	11.37%	24.52%	22.72%	21.87%
MADRID	2.16%	0.45%	0.47%	62.60%	73.31%	74.24%	7.71%	5.16%	7.09%	27.53%	21.08%	18.20%
MURCIA	22.34%	9.81%	9.77%	39.71%	54.70%	58.31%	5.25%	8.54%	10.22%	32.71%	26.94%	21.70%
NAVARRA	28.35%	8.62%	5.48%	36.27%	47.24%	50.36%	5.19%	6.10%	7.98%	30.20%	38.04%	36.17%
PAIS VASCO	7.85%	3.52%	2.73%	36.42%	48.86%	54.40%	5.64%	3.51%	6.73%	50.10%	44.11%	36.13%
LA RIOJA	40.22%	13.55%	9.51%	29.55%	50.01%	52.66%	4.40%	6.89%	7.60%	25.84%	29.54%	30.24%
SPAIN	17.87%	6.43%	5.00%	42.90%	59.57%	62.44%	6.49%	6.62%	8.93%	32.74%	27.38%	23.90%
C. OF VARIATION	0.49	0.57	0.58	0.21	0.15	0.15	0.17	0.28	0.20	0.31	0.36	0.33

Table 8

PUBLIC CAPITAL AS A SHARE OF G.D.P.

	1964	1973	1981	1985	1991
SPAIN		20.47%	24.28%	31.09%	34.75%
	37.50%				
ANDALUCIA		25.35%	30.17%	37.86%	43.26%
	50.92%				
ARAGON	34.88%	38.19%	54.24%	53.54%	51.56%
ASTURIAS	22.89%	26.61%	33.84%	41.09%	47.74%
BALEARES	18.97%	17.02%	21.59%	21.40%	23.72%
CANARIAS	25.82%	31.33%	40.00%	43.82%	44.83%
CANTABRIA	17.82%	21.68%	29.50%	35.10%	47.79%
CASTILLA-LEON	32.95%	39.04%	48.98%	53.00%	55.98%
CASTILLA-LA MANCHA	35.61%	38.46%	49.94%	56.07%	58.78%
CATALUÑA	12.09%	18.00%	21.00%	24.11%	24.60%
C. VALENCIANA	16.19%	20.77%	28.11%	31.70%	33.22%
EXTREMADURA	43.68%	45.22%	53.80%	57.97%	69.33%
GALICIA	28.36%	26.97%	33.98%	39.71%	45.81%
MADRID	9.91%	14.48%	15.77%	16.22%	17.05%
MURCIA	21.24%	17.76%	28.53%	35.07%	42.21%
NAVARRA	29.88%	28.19%	53.26%	52.36%	52.37%
PAIS VASCO		13.97%	21.69%	34.71%	42.04%
	45.47%				
LA RIOJA	21.05%	24.48%	76.33%	73.09%	61.71%

Table 9

GROWTH RATE OF REAL GROSS DOMESTIC PRODUCT

Panel A
(Percentages)

	1977-81	1989-94	Difference Between Groups in Differences Between Periods
Poor Group	1.33	1.47	
Rich Group	2.51	1.24	1.41 (2.31)

Panel B

Variable	Coefficient	t-statistic
Constant	0.0014	0.14
Baleares	0.0311	2.99
Madrid	0.0046	0.44
Cataluña	-0.0035	0.34
La Rioja	0.0054	0.52
Navarra	-0.0037	0.36
Extremadura	0.0037	0.39
Castilla-La Mancha	-0.0097	1.02
Castilla-Leon	-0.0156	1.64
Galicia	-0.0038	0.40
1977-79	0.0313	4.26
1979-81	0.0030	0.41
1989-91	0.0091	1.52
Poor in second period	0.0154	1.82

$R^2 = 0.67$

Omitted variables are Andalucia and 1991-94.
Dependent variable is annual growth rate of real GDP.

Table 10

REAL GROSS DOMESTIC PRODUCT PER CAPITA

Panel A
(1980 Pesetas)

	1977-81	1989-94	Difference Between Groups in Differences Between Periods
Poor Group	299,663	417,217	
Rich Group	469,545	669,154	-82,055 (3.48)

Panel B

Variable	Coefficient	t-statistic
Constant	0.4920	31.37
Baleares	0.2608	16.63
Madrid	0.2232	14.24
Cataluña	0.2041	13.02
La Rioja	0.1274	8.12
Navarra	0.1508	9.62
Extremadura	-0.0348	2.43
Castilla-La Mancha	0.0375	2.62
Castilla-Leon	0.0760	5.31
Galicia	0.0383	2.67
1977	-0.2275	17.76
1979	-0.2071	16.18
1981	-0.2125	16.60
1989	-0.0325	2.93
1991	-0.0157	1.42
Poor in second period	-0.0821	6.41

$R^2 = 0.98$

Omitted variables are Andalucia and 1994
Dependent variable is annual real GDP per capita.

Table 11

UNEMPLOYMENT RATE

Panel A
(Percentages)

	1977-81	1989-92	Difference Between Groups in Differences Between Periods
Poor Group	9.87	19.19	
Rich Group	7.97	12.36	4.93 (3.75)

T-statistic in parentheses.

Panel B

Variable	Coefficient	t-statistic
Constant	0.2206	28.46
Baleares	-0.1054	14.68
Madrid	-0.0679	9.46
Cataluña	-0.0716	9.98
La Rioja	-0.1136	15.82
Navarra	-0.0863	12.02
Extremadura	-0.0193	2.95
Castilla-La Mancha	-0.1001	15.28
Castilla-Leon	-0.0980	14.96
Galicia	-0.1320	20.15
1977	-0.0890	12.40
1978	-0.0721	10.05
1979	-0.0549	7.64
1980	-0.0327	4.55
1981	-0.0111	1.55
1988	0.0094	1.44
1989	-0.0084	1.28
1990	-0.0196	2.99
1991	-0.0215	3.28
Poor in second period	0.0493	8.41

$R^2 = 0.96$

Omitted variables are Andalucia and 1992.
Dependent variable is annual unemploument rate.

Table 12

GROWTH RATE OF EMPLOYMENT

Panel A
(Percentage)

	1977-81	1988-92	Difference Between Groups in Differences Between Periods
Poor Group	-2.91	0.43	
Rich Group	-2.77	1.24	-0.67 (0.72)

T-statistic in parentheses.

Panel B

Variable	Coefficient	t-statistic
Constant	-0.0180	1.53
Baleares	-0.0098	0.87
Madrid	-0.0019	0.17
Cataluña	-0.0002	0.02
La Rioja	-0.0150	1.33
Navarra	-0.0008	0.07
Extremadura	-0.0063	0.61
Castilla-La Mancha	-0.0088	0.85
Castilla-Leon	-0.0013	0.13
Galicia	-0.0191	1.85
1977-78	-0.0005	0.05
1978-79	-0.0041	0.39
1979-80	-0.0051	0.50
1980-81	-0.0059	0.57
1988-89	0.0634	6.86
1989-90	0.0466	5.04
1990-91	0.0359	3.88
Poor in second period	-0.0069	0.74

$R^2 = 0.67$

Omitted variables are Andalucia and 1991-92.
Dependent variable is annual growth rate of employment.

Table 13

GROWTH RATE OF REAL PRIVATE NON-RESIDENTIAL INVESTMENT

Panel A
(Percentage)

	1977-81	1988-91	Difference Between Groups in Differences Between Periods
Poor Group	3.98	4.81	
Rich Group	0.26	4.95	-3.85 (0.88)

T-statistic in parentheses.

Panel B

Variable	Coefficient	t-statistic
Constant	0.0235	0.47
Baleares	0.0159	0.33
Madrid	-0.0114	0.24
Cataluña	-0.0180	0.37
La Rioja	-0.0854	1.77
Navarra	-0.0307	0.64
Extremadura	0.0944	2.10
Castilla-La Mancha	-0.0429	0.95
Castilla-Leon	-0.0019	0.04
Galicia	-0.0044	0.10
1977-78	0.0625	1.46
1978-79	0.0148	0.35
1979-80	0.0551	1.29
1980-81	-0.0881	2.06
1988-89	0.1413	3.75
1989-90	0.0214	0.57
Poor in second period	-0.0366	0.90

$R^2 = 0.51$

Omitted variables are Andalucia and 1990-91.
Dependent variable is annual growth rate of real private non-residential investment.

Table 14

REAL PRIVATE NON-RESIDENTIAL INVESTMENT PER CAPITA

Panel A
(1980 Pesetas)

	1977-81	1988-91	Difference Between Groups in Differences Between Periods
Poor Group	111,413	141,297	
Rich Group	127,231	202,440	-45,325 (4.24)

T-statistic in parentheses.

Panel B

Variable	Coefficient	t-statistic
Constant	0.1626	20.15
Baleares	0.0595	7.88
Madrid	0.0207	2.74
Cataluña	0.0476	6.30
La Rioja	0.0418	5.53
Navarra	0.0582	7.70
Extremadura	0.0348	4.96
Castilla-La Mancha	0.0490	6.98
Castilla-Leon	0.0471	6.71
Galicia	0.0179	2.55
1977	-0.0897	12.18
1978	-0.0817	11.10
1979	-0.0790	10.72
1980	-0.0701	9.52
1981	-0.0839	11.39
1988	-0.0217	3.26
1989	-0.0018	0.27
1990	0.0008	0.11
Poor in second period	-0.0453	7.18

$R^2 = 0.89$

Omitted variables are Andalucia and 1991.
Dependent variable is annual real private non-residential investment per capita.

Table 15

DIFFERENCES-IN-DIFFERENCES REGRESSIONS WITH LAGGED DEPENDENT VARIABLE

	(1) Growth Rate of Real GDP	(2) Real GDP per Capita	(3) Unemployment Rate	(4) Growth Rate of Employment	(5) Growth Rate of Private Investment	(6) Private Investment per Capita
Constant	-0.013	0.200	0.044	0.040	0.047	0.075
	(2.95)	(11.97)	(4.74)	(6.13)	(1.51)	(9.95)
Poor	0.014	-0.082	0.049	-0.007	-0.038	-0.045
	(2.31)	(3.48)	(3.75)	(0.72)	(0.88)	(4.24)
R^2	0.40	0.60	0.64	0.06	0.09	0.69
Constant	-0.013	0.234	0.038	0.072	0.059	0.066
	(2.76)	(5.97)	(1.89)	(4.07)	(2.02)	(15.98)
Poor	0.015	-0.080	0.050	-0.032	-0.032	-0.025
	(2.20)	(3.37)	(3.54)	(2.06)	(0.81)	(3.76)
Lagged dependent variable	0.045	-1.35	0.111	0.896	-0.501	-1.102
	(0.35)	(0.98)	(0.35)	(1.90)	(1.66)	(5.01)
R^2	0.41	0.65	0.64	0.38	0.34	0.93

Notes: Each regression has ten observations corresponding to the ten regions.

The dependent variable is the difference between the average value for the variable in the post intervention period (typically 1988 to 1992) and the average value for the variable in the pre-intervention period (1977 to 1981).

The lagged dependent variable is defined analogously to the dependent variable with the periods 1977 to 1981 and 1973 to 1977.

Absolute values of t-statistics in parentheses.

The variable "poor" takes a value of one for the five poor regions and zero for the five rich regions. See the text for a list of the regions.

Table 16

INDUSTRY-SPECIFIC DIFFERENCES-IN-DIFFERENCES REGRESSIONS

Growth Rate of Value Added (GDP)

	(1) Agriculture	(2) Manufacturing	(3) Services	(4) Construction
Constant	0.063	-0.042	0.014	0.086
	(1.21)	(2.40)	(1.70)	(2.19)
Poor	-0.030	0.029	0.019	-0.065
	(0.41)	(1.14)	(1.62)	(1.17)
R^2	0.02	0.14	0.25	0.15

Growth Rate of Employment

	(1) Agriculture	(2) Manufacturing	(3) Services	(4) Construction
Constant	-0.014	-0.034	0.019	0.129
	(0.25)	(1.93)	(3.06)	(5.32)
Poor	-0.032	-0.001	0.025	-0.073
	(0.41)	(0.05)	(2.94)	(2.14)
R^2	0.02	0.00	0.52	0.36

Notes: Each regression has ten observations corresponding to the ten regions.
The dependent variable is the difference between the average value for the variable in the post intervention period (1989 to 1991) and the average value for the variable in the pre-intervention period (1977 to 1981).
Absolute values of t-statistics in parentheses. The variable "poor" takes a value of one for the five poor regions and zero for the five rich regions. See the text for a list of the regions.

Table 17

MEASURES OF GOVERNMENT POLICY INTERVENTION

Panel A
Growth Rate of Real Public Investment (percentages)

	1977-81	1988-91	Difference Between Groups in Differences Between Periods
Poor Group	-4.48	17.81	
Rich Group	-19.48	13.07	-10.28 (1.29)

Panel B
Real Public Investment per Capita (1980 pesetas)

	1977-81	1988-91	Difference Between Groups in Differences Between Periods
Poor Group	20,027	61,097	
Rich Group	37,848	51,416	27,502 (1.69)

T-statistics in parentheses.