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EVALUATING THE IMPACT OF THE EUROPEAN
REGIONAL DEVELOPMENT FUND: METHODOLOGY
AND RESULTS IN ASTURIAS (1989-1993)

**Evaluating the impact of the European Regional Development Fund:
methodology and results in Asturias (1989-1993)**

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ABSTRACT

This working paper presents the results for Asturias of research on the impact of the European Regional Development Fund on the objective 1 regions during the period 1989-1993. The methodology used in the evaluation, which was based on a survey covering some 84% of the investment, is described. The study of this regional policy instrument leads to the conclusion that a major macroeconomic effect on income has occurred in Asturias, due to the concentration of investment on a few divisions during a limited period of time. Also, there has been a notable short term impact on regional employment.

The authors thank again all the people that provided valuable information during the data collection process. Their support was essential for the accomplishment of the evaluation tasks. However, the opinions made herein are the sole responsibility of the authors.

This document is an ammended and enlarged version of the paper presented at the 35th Congress of the European Regional Science Association (Mato, Hernández and Blanco, 1995).

RESUMEN

Este documento de trabajo presenta los principales resultados de la investigación que evalúa el impacto de las ayudas comunitarias del Fondo Europeo de Desarrollo Regional, correspondientes al objetivo nº 1, durante el periodo 1989-1993. Se describe la metodología utilizada en la evaluación, que estuvo basada en una encuesta a un conjunto de proyectos que representaban el 84% de la inversión cofinanciada. El estudio de este instrumento de política regional permite concluir que el principal efecto, de naturaleza macroeconómica, ha tenido lugar en Asturias, como consecuencia de la concentración de la inversión en un número reducido de ramas durante un corto periodo de tiempo. Asimismo, se reconoce un fuerte impacto a corto plazo sobre el empleo de la región.

Los autores desean reiterar su agradecimiento a todas las personas que en su momento contribuyeron con su información al desarrollo de las tareas de evaluación y que fueron un soporte indispensable para la realización del ejercicio. Sin embargo, las opiniones vertidas en este documento sólo vinculan a los autores.

Este trabajo es una versión ampliada y corregida de la ponencia presentada al 35 Congreso de la Asociación Europea de Ciencia Regional (Mato; Hernández and Blanco, 1995).

Evaluating the impact of the European Regional Development Fund: methodology and results in Asturias (1989-1993)

"Although they are not asked to take it, those engaged in regional development should be mindful of the Hippocratic oath: 'At least, do not harm'" (W. Alonso, 1989, p. 236).

1. Introduction

This working paper evaluates the application of an important regional policy instrument, i.e. the European Regional Development Fund (ERDF) to an old industrial area. In Asturias funds equivalent to 1.9% of the regional GVA were spent per year between 1989-1993 within the so-called Community Support Framework (from now on CSF), an instrument that is co-financed by the European Community, the national and regional governments, and other institutions and firms. The objective of the paper is to contribute to the debate on regional policy evaluation by presenting a case-study, and making some comments on the regional policy strategies available for the recovery of declining regional economies.

The structure of the paper is the following: after this introduction comes a brief remainder of the Community's regional policy where the instrument being assessed, i.e. the CSF, is introduced. Part 3 is also an introduction describing the economy to which the policy was addressed, the northern region of Asturias, Spain. A comment on the regional policy strategy envisaged for Asturias within the European economic environment is presented in part 4. Part 5 describes the evaluation exercise, formed by a qualitative appraisal of the CSF (using information from a sample of projects that covered 84% of the total investment), and a quantitative input-output analysis of the economic impacts of the investment. This is followed by some concluding remarks.

Apart from the interest of a declining region, some features make Asturias a good case study for regional policy evaluation. These are the concentration of population and activity on the central and better communicated metropolitan district, and the availability of solid input-output tables. These, together with the participation of the authors in a nation-wide analysis of the CSF,¹ define the origins of this paper.

¹ The national project was coordinated by FEDEA, taking place between 1992 and 1994. The aim was to evaluate the impact of the Community funds coming to Spanish objective 1 regions in the period 1989-1993. The project was financed by the Dirección General de Planificación del Ministerio de Economía y Hacienda. The main results are available in FEDEA (1994a, b, c and d), Herce (1995) y De Rus y Romero (1995).

2. The regional policy of the European Community

This paper looks at the effects of a well known instrument of regional policy: the European Regional Development Fund (ERDF). The ERDF is the main branch of a European regional policy that, excluded from the Treaty of Rome, developed in the seventies and acquired more relevance alongside the various enlargements of the European Community. Regional matters became more important as the Community's periphery grew larger, increasing regional disparities via growth of the lower end of the range.

As the Community regional policies developed in time, their orientation shifted, the distribution of funds changing from a system based on quotas to a means-tested one. After 1987, the Single European Act enhanced the objective of economic and social cohesion, which applied indeed to regional disparities. The Structural Funds were reformed in 1988, and the cohesion objective was specified by introducing the following criteria in providing European regional aid: concentrating resources in order to obtain real economic impact of the aid in the poorer regions; increasing certainty and reducing bargaining costs by developing a five-year plan; considering the subsidiarity principle, i.e. taking into account the different tiers of government in the programming of the projects; and avoiding substitution of local moneys by European ones by introducing the additionality principle, i.e. adding the Community's funding to the national and/or the regional one.

These criteria have been put into practice by selecting the well-known five objectives that head the co-ordinated action of the traditional Community regional instruments since 1989. The concentration of the greatest resources in less developed regions (objective 1) built upon the elaboration of Regional Development Plans (RDP). These documents integrated all the public regional policies that could apply for Community funding, and were the basis for the drawing up of the so called Community Support Framework (CSF), the tools that allowed true multiannual programming in structural policies. The CSF, a document where the financial resources available for the regions were allocated amongst the main sectors to be acted upon, represents the policy to be assessed in this paper.

3. Asturias as an objective for regional policy

Objective n° 1 aims at the development and structural adjustment of the less developed regions in the Community. Both objectives pertain to the particular case of Asturias. The region is in need of development, since its income per head is still quite below the Community average; and it is also in need of economic adjustment, given the formidable extent of the structural problems born by the main productive sectors in the region. These problems, that are manifest in a growing gap between the regional and the national growth patterns, have been studied and synthesised

by various authors² who reach a common diagnosis on the factors that describe the decline of the Asturian economy. These factors form the burdens to which regional policy strategies must be addressed. A synthesis of them is the following:

- *concentration of industrial activity* on a small number of sectors (coal mining, steel, shipbuilding, non ferric metals) in which public property and large size dominate. This is accompanied by a limited development of small and medium enterprises. These are shaped by their functioning as simple providers of basic inputs, which reduces their potential to generate alternative business, making difficult for a diversification of the regional structure of production to take place.³
- *weak territorial equilibrium, both inward and outward*. The position of Asturias at the periphery with respect to the development spindles in the Spanish economy is aggravated by the problems related to land transport, due mainly to insufficient radial and transversal infrastructures. From an intraregional stance, the eastern and western districts of the region are not linked to its core, basically as a result of a secular abandonment of land infrastructure along the Cantabrian Mountain range. That infrastructure would have favoured the articulation of regions and districts without accelerating the rural-urban or agriculture-industry dualism.
- As a consequence of the concentration of economic activity in declining industrial sectors, or in traditional ones of low productivity as agriculture, the regional economy has a limited capacity to create jobs. Unemployment in Asturias is the result of a *continued process of job destruction*, given that the labour force has been stagnant for fifteen years (see figure 1). The unemployment problem is worsened due to the existence of low rotation in the labour market, which reduces the probability of finding a job for the unemployed.
- the characteristics of past industrial and urban growth, geographically concentrated in the central district of Asturias, has consumed natural resources to a very great extent (albeit not definitely). Rivers, land and coastal areas suffer an *industrial and urban contamination* that is not sustainable in the future, when a new understanding of the relationship between economic activity and the environment will be required. Next to the much deteriorated central district in Asturias, natural resources coexist with a satisfactory conservation status, which became a potential factor of high value, as it allows the integration of modern development and quality of life within a neighbouring territory.

² A synthesis can be found in Castells and Vázquez (1994).

³ The capacity to create internally new activities and companies, the incubation capacity, can be directly related to the external economies generated by the inter-industrial structure of the region. In this respect, there may not have been a positive contribution by the big enterprises located in Asturias (see SADEI-NEI, 1972).

Figure 1
Asturias. Labor market trends
 Labor force survey

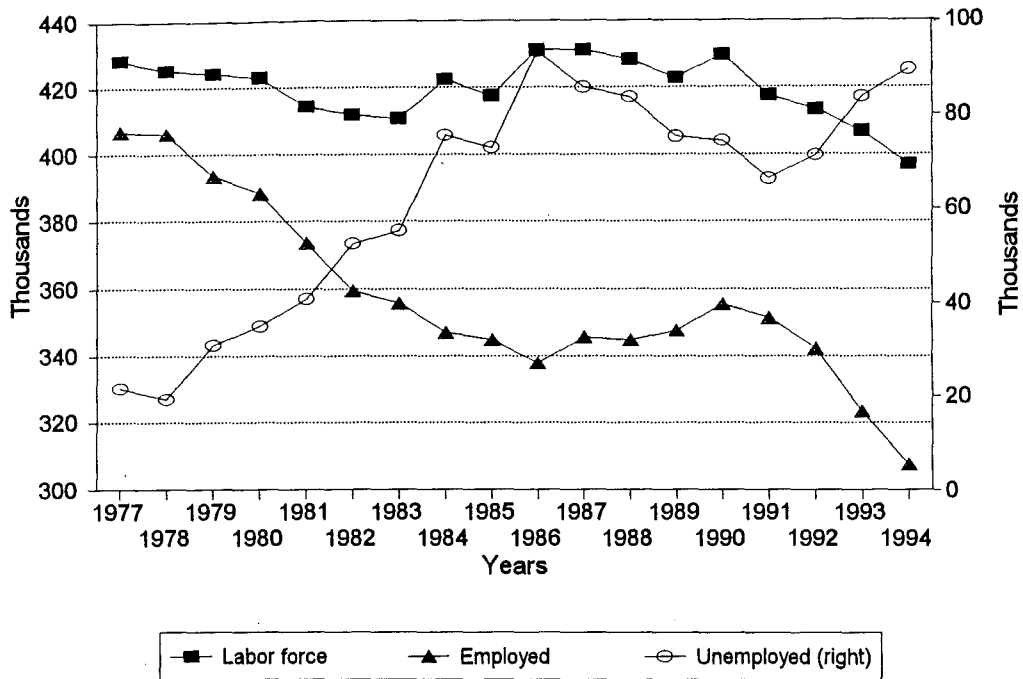
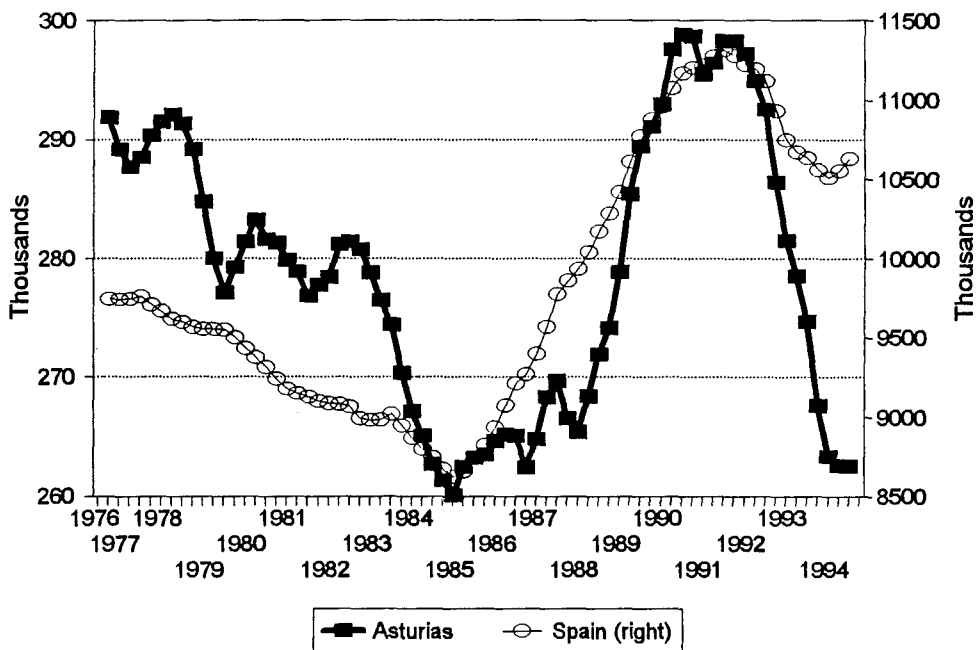


Figure 2
Asturias. Non-agricultural employment
 Labor force survey *Moving average*



Therefore, the number and type of problems faced by Asturias make it a good model of an old industrial area (Steiner, 1985). A specificity of this region is that these problems have been confronted with a marked delay, as compared to the periods when other European regions experienced the productive adjustments. There has been a timely coincidence between the adjustments in the productive economy and the application of the financial instruments aimed at relieving, at least partially, the impacts of industrial restructuring. However, it is difficult for the dimension of the job losses to be completely compensated in the short term with some partial instruments that are designed to induce positive changes in the long term economic potentiality of a region.

4. A regional policy strategy for a declining region

The fact that the Structural Funds arrived in Asturias quite early⁴ responds to the view of regional policy as an economic compensation for the integration in the European Community (Cappellin, 1988), given the direct influence of the integration process on basic productive sectors of the region (steel, shipbuilding, milk production).

The role of regional policy in the late eighties was strengthened in Spain as a result of the political decentralisation that followed the new Constitution in 1978. This process was intensified with the entry in the European Community in the mid-eighties: access to the regional policy instruments allowed the undertaking of numerous projects that seem especially valuable after the decelerating pace experienced by public investment between 1975 and 1985.

Within the new institutional framework, the regional development strategy adopted by Asturias was represented by its own CSF 89-93, which confronted the two main handicaps of the region: the territorial unbalance (through investing in transport infrastructure) and the environmental deficit.⁵ This strategy is coherent with the diagnosis that has guided Community regional policy in which investment in infrastructure was given priority (Biehl, 1986; 1991).⁶ Also, this policy has been strengthened lately by the empirical literature available.⁷

⁴ A National Programme of Community Interest (NPCI) for Asturias was approved in 1987, one year after Spain joined the Community.

⁵ Estimating regional indicators on the availability of infrastructures has proved to be a difficult matter. See Nieves and Piñero (1992), and De Rus, Román, and Trujillo (1995).

⁶ Promotion of economic activity has taken a secondary role, falling under national policies.

⁷ The impacts of infrastructure investment have been the object of large and elaborate studies after Aschauer's (1989) work. The soundness and the intensity of the redistribution policies adopted in Spain taking the form of public investment in infrastructure have been questioned on the basis that they may hinder the growth potential of the leading regions (Pérez, 1992). However, in Esteban and Vives (1994, Vol.I), and De la Fuente and Vives (1995) it is argued that the conflict between the efficiency and the

Figures 3 and 4 show the distribution of eligible investment by sectors for the period 1989-1993, referring to the Spanish CSF (objective 1 regions) and to the Asturian one.⁸ The evaluation exercise took into account investment in sectors 1,2,3 and 5 only. Although the grouping by sectors may lead one to think of uniform investment, investment is actually carried out through specific projects of varying nature. The main projects subject to evaluation have been presented in table 1 in order to give the reader a clear idea of the features of the investment.

Table 1
Asturias. CSF 89-93 investment by sectors

SECTOR 1 Transports and communications infrastructure	<ul style="list-style-type: none"> - Thrust to investment programmes in the central district (inter- and intra-regional links by motorway). - Local road networks - Decongestion of urban centres (city circulars) - Port infrastructures
SECTOR 2 Industry, services and crafts	<ul style="list-style-type: none"> - Assistance to entrepreneurial activities (orientation and investment) - Thermoelectricity group - Creation of industrial space - Incentive of productive activities
SECTOR 3 Tourism	<ul style="list-style-type: none"> - Small projects in the services sector (camping and museums)
SECTOR 5 Promotion of economic activities	<ul style="list-style-type: none"> - Sewage farms in the central district - Correction of industrial and urban dumping to the rivers in the central district - Rural electricity projects - Endowment of scientific equipment (University of Oviedo)
SECTOR 6 Valuing human resources	<ul style="list-style-type: none"> - Multifunctional centre in Gijón

need criteria is partly artificial if the complementarity of the factors of production is taken into account. Given an equivalent stock of public capital, its productivity would be higher in regions with a larger stock of other factors.

⁸ The remaining regions were, during the period of study, Andalusia, Castille-Leon, Castille-La Mancha, Extremadura, Galicia and the Community of Valencia. See Commission of the European Communities (1989).

Figure 3

National CSF investment by sectors
Objective 1 regions. Spain

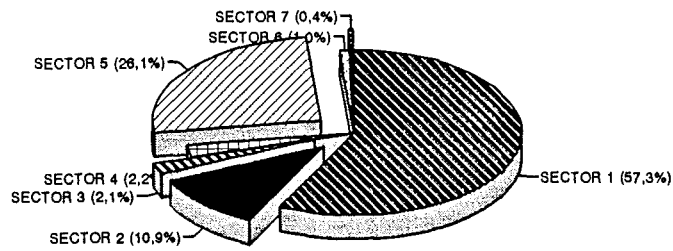
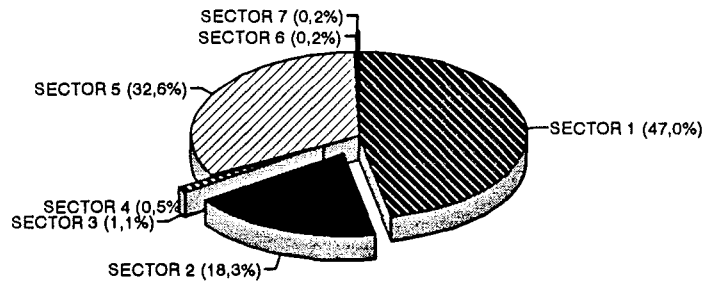


Figure 4

Regional CSF investment by sectors
Asturias



LEGEND: SECTOR 1 Territorial integration and articulation
SECTOR 2 Industry, services and crafts
SECTOR 3 Tourism
SECTOR 4 Agriculture and development

SECTOR 5 Promotion of economic activities
SECTOR 6 Valuing human resources
SECTOR 7 Technical assistance
SECTOR 8 Objectives nº 3 and 4

SOURCE: FEDEA (1994A)

5. The evaluation of the Community Support Framework

The CSF 1989-1993 was evaluated in two complementary ways. Firstly, Asturias is one of nine Spanish objective 1 regions that were scrutinized within a wide-scope evaluation process coordinated by FEDEA (see FEDEA, 1994a). Secondly, the impact of the CSF investment achieved in the region was analyzed using a demand input-output model. In both exercises evaluation was made ex-post by external agents. The next paragraphs are devoted to explaining the first, more qualitative study, and the results obtained for the region.⁹

The first exercise considered substantial evaluation criteria. The aim was to assess the planning of the investment, its execution and its impact. Both quantitative and qualitative information was collected, regarding the following features of the investment projects: planning, budgeting, administrative domain, inputs (domestic and imported), outputs, and various environmental impacts.

Data were collected through interviews with several agents: economists at the Asturian Government Economic Council (Consejería de Economía); the heads of the institutions that implemented the projects (firms -public and private-, regional or local agencies, ports authorities, Ministry of Public Works...); and other participants in the design, planning or accomplishment of the projects (public servants at the three tiers of government, firms' staff...).

The evaluation was based upon a sample of 29 projects, from a total of 70 that formed the Asturian CSF. However, the investment of the sample amounted to 89.946 MPts. (at 1989 prices), accounting for 85,7% of the total eligible investment within the Asturian CSF 89-93. This means a higher representation than the overall Spanish CSF average evaluated (323 projects out of 1.013, and 57,7% of investment). Also, the investment included in the sample reached to 91% in sector 2 and 100% in sector 6, the pattern being that greater weight of investment in a sector was accompanied by higher representativity of the sample in the sector.¹⁰

⁹ For an extended version of the regional studies, see FEDEA (1994c).

¹⁰ The samples of the more important sectors (1 and 5) show a high representativity (86,9% and 83,9%). The evaluation excluded sectors 1 and 7, for the CSF in Asturias lacked of projects in these.

5.1. Planning and the institutional framework

Asturias is an Autonomous Community formed by just one province, and therefore the regional institutional framework is formed by the local and regional administrations. These, together with national government agencies (autonomous or not), and public or private firms, have been responsible for the projects evaluated. For all of the activities there was a single institution in charge, and only three projects reported some competence problems.

Regarding the role of the local authorities; even when these have been in charge of a project, the councils have not handled ERDF moneys directly. The funds have been transferred to them by the regional government, and the complaints reported in this respect are faced with the administrative complexity that could have followed otherwise.

A specific feature of the CSF in Asturias is that several investment projects were originated within previous regional development programmes. Some projects included in the CSF came from the National Programme of Community Interest (NPCI), one approved by the Commission in 1987 that aimed at the development of the region's central area. Other projects came from the 1988 programme for conversion of steel areas (RESIDER). Overall, most of the projects (all but three) were included in the RDP, and there is great coherence among the activities.

5.2. Budgeting and implementation

The assessment of the Asturian CSF concluded that some deviations from the budgets occurred. These have consisted in underbudgeting more frequently than overbudgeting. However, as stated above, deviations have not affected the ERDF balances, rather they have been assumed by the institutions responsible for the projects.

The multiannual character of the CSF has allowed the timing of the investment for each one of the projects, and thus a comparison could be made between planned and actual investment on a year to year basis. The results indicate that the delays observed in Asturias tended to disappear in time, and at the end of the five-year period, up to 96,5% of the cumulative commitments had been executed. This is a better record than the national one (88,4%).

Overall, the appraisal of the planning and implementation of the Asturian CSF yields rather positive results. The sectors and the contents that were the object of the investment are coherent with the most important needs perceived back in 1989; and the execution of the investment, although some projects had not been

finished, surpassed the national standard. The record of the 89-93 CSF allows the conclusion that Asturias lacks absorption problems: the decisions as to where to invest, and the implementation of investment have been dealt with satisfactorily. Thus, the effectiveness side of the evaluation seems beneficial. It is the impact side that remains to be examined.

5.3. Qualitative impact on the regional economy

The evaluation of regional policy impacts faces two main obstacles. First, it seems difficult to assess after a short period what is a long term goal: the improvement of the income levels in the regions, and the structural change of the economies. Second, there is the problem inherent in most evaluation exercises within the social sciences: the uncertainty as regards what would have occurred in the absence of the policy that is evaluated. Nevertheless, this evaluation has included a qualitative impact assessment for each project, and a comment on the results is offered below.

In relation to the first problem, i.e. the time span, an opinion was made about the impact of the CSF on the economic activity of Asturias. Firstly, regarding the firms operating in the areas affected by the projects, it was perceived that competitiveness would improve as a result of more than two thirds of the actions (69,0% in Asturias, 68,0% in Spain). These results reveal that the outputs of CSF projects entail a group of services addressed mainly to the firms operating in the respective areas. The services bring about significant reductions in operating costs (e.g. transport, or environmental costs)¹¹ whereas the improvement in the capacity to induce new activities occurs at a more general level. This feature, a simultaneous and positive impact on the local environment and on the external image of the region -in relation to other competing ones-, is specially manifest in sector 1 projects.

Facing the question of project impacts on new private activity and investment, an inferior rate of positive results was obtained. It was stated that 44,8% of the projects (37,2% in Spain) contribute to induce private investment by local agents, a result that is more frequent in sectors 1 and 2, and less so in sector 5.¹² Thus, the capacity of private initiative to value public investment in Asturias through specific projects is rather modest, or, from a more optimistic stance, it is still not manifest.

¹¹ For example, the endowment of sewage farms may imply a higher price for water supply, given that maintenance costs must be born by users. However, the firms involved have benefitted from investment subsidies, and the sewage will avert the payment environmental fines.

¹² The positive answer reflects the opinion of evaluators as to each project's capacity to generate an additional investment of a sum equal or greater than the project's.

Regarding the second problem above, that is, uncertainty on the real effects of aids, if an investment project was necessary it would reduce or eliminate a previously existing excess demand of the services provided by it. In this respect, the question of whether a permanent excess demand would exist in the absence of the projects, was given a positive answer in 92,9% of the cases in Asturias (89,9% in Spain). After the completion of the CSF 89-93, the excess demand was perceived to have fallen to 41,4% of the cases (25,3% in Spain), excess supply accounting for 24,1% (17,6% in Spain) and equilibrium being achieved in the remaining ones. An example of excess supply is the endowment of sewage farms with a surplus capacity compared to the population in the area. Thus, this indirect assessment showed a significant improvement in the perceived satisfaction of the needs met by CSF projects.

An important question posed for the projects was if they were addressed to propel indigenous potential or rather to attract external activities. It seems that the regional development model that is suggested in Asturias depends to some extent on the inducement of external investment, although an important number of projects, albeit lower than the Spanish one, contemplate the putting into play of indigenous potential. This is more so in the flanks of the region than in the centre. This result shows a persisting lack of confidence in the capacity of the region's available resources to overcome, on their own, the strong declining tendency of the economy.

Finally, the contribution of CSF investment to the structural change will depend upon the capacity of the new infrastructures, especially the communications and the environmental ones, and the incentives to actually attract foreign resources. Time is needed for the emergence of these effects, but the projects already finished mean a potential in this respect.¹³

5.4. Qualitative impact on the environment

Given the substantial component of the CSF investment that was devoted to improve the quality of the environment in Asturias, a note must be made in this respect. The assessment has revealed what may seem contradictory: while over 50% of the projects studied present severe or relevant positive effects on the environment, the ex-ante environmental impact studies (EIS) were very scarce. This may be due to both the lack of tradition in Spain and the fact that many projects did not legally require an EIS, for they were enlargements or changes in existing

¹³ In the last few years two important private projects have taken place in Asturias: a chemical plant by DuPont and a Thyssen factory that produces mechanical escalators. These new activities due to foreign investment mean an increase of the industrial capacity.

infrastructures (e.g. new routing of roads). Overall, only 17% of the projects (34% in Spain) were modified because of environmental reasons.

5.5. Input-Output analysis of the Community Support Framework

The input-output analysis can serve as a way to describe, from a quantitative point of view, the macroeconomic impacts of the CSF in Asturias. An analysis was conducted for the national CSF eligible investment by FEDEA staff in Madrid, using the 1989 input-output table of the Spanish economy.¹⁴ However, it can be useful to compare the deviations that may arise in the results, which can be caused by the different configuration of the final demand in the region, and by the dissimilar economic structure.¹⁵

The 1990 input-output tables of the Asturian economy have been used to carry out this exercise.¹⁶ They were developed by SADEI with disaggregation of the economy in fifty divisions (SADEI, 1993).¹⁷ The vector of final demand appears in table 2, having resulted from relating the information obtained from the questionnaires of the assessed projects to the whole CSF investment in Asturias. The table shows that the construction sector has received up to 75% of the eligible investment, almost 10% above the national figure. Another remarkable sector is machinery and equipment, with 15,4%. Hence, it is concluded from the sample

¹⁴ The methodology is described in FEDEA (1994b) and the results for Spain (objective 1 regions) appear in the cited FEDEA (1994a).

¹⁵ The Spanish Finance and Economics Ministry has made a similar exercise of simulation based upon the 1987 input-output table of the Spanish economy. The national results were distributed regionally under the assumption of equivalent productive structures (see MEH, 1994). Our analysis is directly comparable with the results of FEDEA (1994b) and means an indirect contrast of the validity of the hypothesis made.

¹⁶ The exercise consists of determining the value of effective production required to satisfy the demand caused by the cofinanced public expenditure. The basic equation of the model is:

$$w = [I - A_d]^{-1} f_d^*$$

where w is the vector of effective production of domestic origin, for the fifty divisions in which the economy is divided; A_d is the direct requirements table or Leontief technology matrix (regional coefficients); $[I - A_d]$ is the total requirements table (Leontief Inverse) determined on the coefficients of regional origin and f_d^* is the vector of final demand (see Table 2). It is assumed that all the production required to satisfy the final demand vector comes from the domestic sectors, product imports being limited to those required by the regional economy (Pulido and Fontela, 1993, criticize this hypothesis). The vector representing productivity by divisions in 1990 allows the computation of employment and value added. It is also possible to estimate imports coming from the rest of Spain and from abroad, using the respective matrices of import coefficients (see the appendix for a complete development).

¹⁷ SADEI is an institution in Asturias that pioneered research on regional input-output. Back in 1972, a study participated by SADEI was directed by Prof. L. Klaassen and included the active participation of Profs. Paelinck and Molle (see SADEI-NEI, 1972).

that an important concentration of eligible expenditure lies within very specific sectors.

Overall, the results do not present major deviations from the ones obtained by FEDEA on the Spanish CSF. In Asturias, the final demand shock generates its highest impact on the value added and employment level of construction and industry, and a lower repercussion on services. The jobs generated or maintained in the period add up to 26.438, which means an investment per job of 3,9 MPtas., similar to the national CSF average (4,2 MPtas.). Dealing with a region, it is not surprising that the relative weight of imported inputs on final demand is greater (25,7%) than the Spanish figure.¹⁸ However, it can be stated that an important share of imports comes from other Spanish regions, imports from abroad being as little as 5%. The main conclusion is that a major element of the CSF impacts, given the structure of the shock, affected the regional productive sectors. The significant effects observed on regional imports can be relatively compensated by the simultaneous investment made in neighbouring objective 1 regions.

An allocation bias of the CSF is showed in the table that favours industry and construction, damaging the tertiarisation of the Asturian economy. These results suggest that the maintenance of the same structure by sectors in future CSF investment may contribute to preserve in some regions specific productive directions that have a notable cyclical element and a strong incidence on the employment (see figure 2, p. 5). Overall, the results are consistent with the available evidence on the economic cycle of the regional economy (HISPALINK-Asturias, 1993). Construction and public investment have sustained to a great extent the level of regional employment, thus contributing to alleviate the impact of industrial adjustments.

¹⁸ The exercise is done assuming that final demand does not include imports, these being limited to intermediate inputs.

Table 2

Asturias. Final demand caused by the CSF 89-93, by divisions. Millions of Pts. (1989 prices)

Sector	Division	Eligible expenditure	%
1	Agriculture	104,89	0,10
2	Fishing	0	0,00
3	Coal mining	0	0,00
4	Manufacturing of coke	0	0,00
5	Extraction of crude petroleum and natural gas	0	0,00
6	Electricity	0	0,00
7	Gas, steam and water supply	0	0,00
8	Mining and manufacturing of metallic minerals	0	0,00
9	Steel products (basic metals)	996,44	0,95
10	Production and early transformation of non-ferrous minerals	115,38	0,11
11	Mining of construction materials and other minerals	0	0,00
12	Manufacturing of cement, lime and plaster	388,09	0,37
13	Glass industries	41,95	0,04
14	Other ceramic industries and non-metallic minerals	0	0,00
15	Manufacture of chemicals and chemical products	0	0,00
16	Manufacture of metal products, except machinery and equipment	304,18	0,29
17	Manufacture of machinery and equipment, non electrical	16184,37	15,43
18	Manufacture of office machinery and precision and optical instruments	451,02	0,43
19	Manufacture of electrical machinery and apparatus	3796,98	3,62
20	Manufacture of motor vehicles and their components	0	0,00
21	Shipbuilding and repairs	0	0,00
22	Manufacture of other transport equipment	0	0,00
23	Meat industries	20,98	0,02
24	Dairy products	0	0,00
25	Other food industries	0	0,00
26	Beverages	0	0,00
27	Tobacco products	0	0,00
28	Manufacture of textiles	0	0,00
29	Manufacture of leather and leather products; footwear	0	0,00
30	Manufacture of wood and wood products	41,55	0,04
31	Pulp, paper and paper products	0	0,00
32	Printed matter and related articles	0	0,00
33	Manufacture of rubber and plastic products	0,54	0,00
34	Other manufacturing industries	0	0,00
35	Construction and public works	79369,5	75,65
36	Repair services	0	0,00
37	Wholesale and retail sale	136,35	0,13
38	Hotel and restaurant services	293,68	0,28
39	Transport	566,4	0,54
40	Communications	0	0,00
41	Financial intermediation and insurance services	0	0,00
42	Indirect financial intermediation services	0	0,00
43	Services offered to businesses	1856,53	1,77
44	Real estate activities	0	0,00
45	Private education and research services	0	0,00
46	Private health services	0	0,00
47	Public education and research	0	0,00
48	Public health services	251,73	0,24
49	Public administration and defense	0	0,00
50	Domestic service and other personal, cultural and recreation services	0	0,00
	TOTAL	104920,8	100,00

Table 3

Asturias. Inputs, GVA, and effective production generated by the CSF projects 1989-1993
(ERDF, Obj. n° 1). Millions of Pts. (1989 prices)

Sector	FD	EP	GVA	IP	IMPs	IMPs	Employment	Investment per job	Bias	GVA Ast.
				Asturias	Totals	Spain				
Agriculture	104,9	371,4	173,3	266,6	196,1	172,3	262,7	0,40	0,26	3,87
Energy	0,0	4048,8	1589,8	4048,8	3667,2	2088,2	350,2	0,00	2,80	11,11
INDUSTRY	22341,5	44112,5	22147,9	21771,0	21302,9	17698,9	5244,7	7,24	30,56	25,28
Intermediate products	1541,9	15811,3	7469,3	14269,5	10067,2	8393,6	1402,2	1,10	10,95	11,86
Capital goods	20736,6	25907,5	13629,9	5171,0	8436,0	6845,0	3471,5	5,97	17,95	6,47
Consumption goods	63,1	2393,6	1048,8	2330,6	2799,7	2460,2	371,0	0,17	1,66	6,95
Construction	79369,5	79810,1	42304,2	440,6	0,0	0,0	17324,9	4,58	55,28	7,81
SERVICES	3104,7	16018,9	11653,4	12914,3	1885,8	1862,5	3255,6	2,67	11,10	51,94
Transports	566,4	4663,0	2868,4	4096,6	47,6	39,7	830,5	0,68	3,23	6,56
Private services	2286,6	10697,6	8267,4	8411,1	1833,1	1818,6	2154,9	1,06	7,41	30,29
Public services	251,7	658,3	517,6	406,5	5,1	4,3	270,2	0,93	0,46	15,09
TOTAL	104920,6	144361,8	77868,5	39441,3	27052,0	21821,9	26438,0	3,97	100,0	100,0
Legend:				Pro-memoria 1990						
FD: Final demand (GVA + IMP, aprox.), equivalent to the eligible investment distributed by sectors (see table).				GVA 1.151.170						
EP: Effective production (IP + GVA, aprox.)				GDP 1.240.738						
GVA: Gross Value Added.				F DEMAND 1.963.440						
IP Asturias: Intermediate products of regional origin				EMPLOYMENT						
IMPs Totals: Intermediate imports by each sector				Construction 35.920						
IMPs Spain: Intermediate imports by each sector that come from Spain				Industry 88.587						
Employment: maintained or created in each sector, workers-year				Total 385.576						
Bias: distribution (%) by sectors of the GVA induced by an increase in FD										
GVA Ast: distribution (%) by sectors of GVA in the Asturian economy, 1990.										

6. Conclusion

The economic decline of Asturias has been taking place for decades. The leading sectors of the regional economy grew in a protectionist economic environment, and are suffering badly from the effects of the process of international liberalisation and integration experienced by the Spanish economy. Particularly, the entry in the European Community has speeded up the process, increasing the damage done to the traditional sectors by competition from abroad. However, joining the Community meant that Asturias could benefit from the Structural Funds, so that the economic adjustments are accompanied by policies that attenuate its effects. The Community's regional policy should be especially valuable for Asturias, since it allows for multiannual investment plans of considerable economic magnitude.

The evaluation made of the Community Support Framework 1989-93 for Asturias allows us to make several comments. First, the effectiveness side of the evaluation is beneficial, both in absolute terms (96,5% of the commitments accomplished by the end of 1993) and in relation to the remaining objective 1 Spanish regions (that average 88,4%). This leads us to emphasize the absorption capacity of the regional economy during that period, together with the skills of the administrators, who selected feasible investment projects.

Secondly, in spite of the difficulties to assess the CSF from the angle of its economic impact, two comments are in order. The short term run impacts of the CSF, as approached through an input output analysis, reveal important effects on income and employment. There has been a major macroeconomic effect on income due to the concentration of investment on a few divisions during a limited period of time. Also, the short term impact on employment has been a notable one, the CSF contributing to the regional employment peak reached in 1990-91. However, these results have a limited time dimension, and thus a restricted capacity to compensate the repercussions of industrial adjustments. Finally, another significant result in the short term has been the inducement of relative spillovers on other regions, via imports.

The decline in the productive activities can only be relieved by the success, in the middle and long term, of the strategies that are implicit in the main investments achieved with the CSF. This is the *capacity effect* that will be exposed when private initiative takes advantage, *in situ*, of the external economies arising from the new social capital. In this respect, and recalling the initial quotation of this paper, it can be stated that the policies assessed in this paper do certainly not harm the future of Asturias.

7. Appendix

The input-output model is based upon the tables built for Asturias by SADEI (1993). The regional economy is disaggregated into fifty divisions, and a vector of final demands with components. According to Pulido and Fontela (1993) it is possible to represent the intersectorial flows of Asturias in the following manner, thus obtaining a general form for a regional economy (including the Value Added Tax, and the distinction of the import flows from other Spanish regions -e- and abroad -RM) of the model presented in their book:

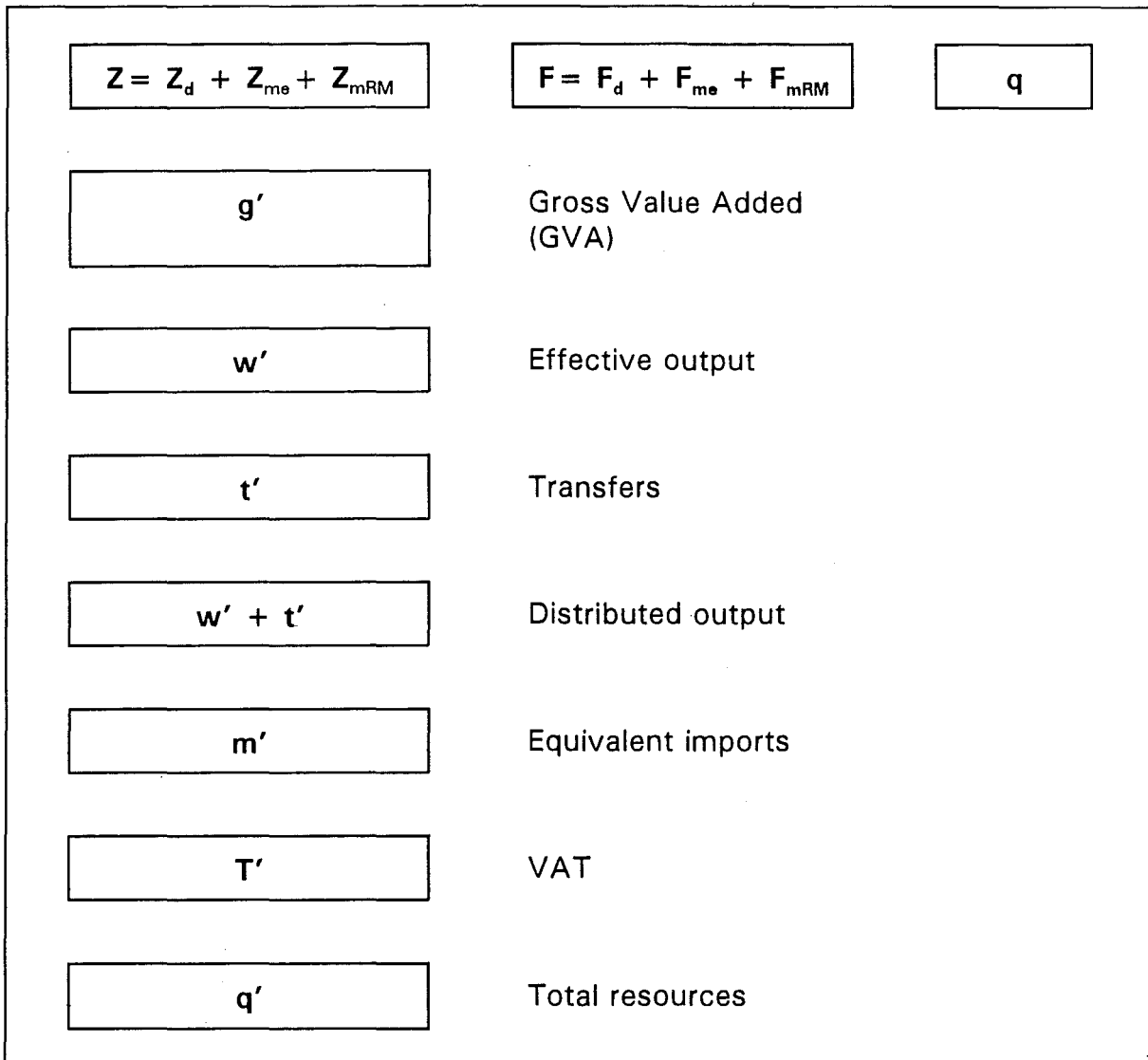


Figure 3

In matrix form, the total resources in the economy can be divided by rows (uses) according to the following expression:¹⁹

$$q = Z_d i + Z_{me} i + Z_{mRM} i + F_d i + F_{me} i + F_{mRM} i = Z_d i + Z_{me} i + Z_{mRM} i + f_d + f_{me} + f_{mRM}$$

¹⁹ Vector i is a column vector with ones.

The total resources in the economy, from the input perspective, adds up to:

$$q = w + t + m + T^f$$

The Value Added Tax (VAT) can be divided into:

$$T^f = T_d^f + T_{me}^f + T_{mRM}^f$$

Total imports are devoted to intersectorial consumption and to final demand:

$$m + T_{me}^f + T_{mRM}^f = Z_{me}^i + Z_{mRM}^i + f_{me} + f_{mRM}$$

Substituting the value of imports and VAT in the equation of resources, by columns:

$$q = w + t + Z_{me}^i + Z_{mRM}^i + f_{me} + f_{mRM} - T_{me}^f - T_{mRM}^f + T_d^f + T_{me}^f + T_{mRM}^f$$

Operating, it is obtained:

$$q = w + t + Z_{me}^i + Z_{mRM}^i + f_{me} + f_{mRM} + T_d^f$$

Making rows equal to columns:

$$w + t + Z_{me}^i + Z_{mRM}^i + f_{me} + f_{mRM} + T_d^f = Z_d^i + Z_{me}^i + Z_{mRM}^i + f_d + f_{me} + f_{mRM}$$

$$w = Z_d^i + (f_d - t - T_d^f) = Z_d^i + f_d^*$$

and having $Z_d^i = A_d w$, where A_d is the matrix that contains the technical input-output coefficients $a_{ij}^d = z_{ij}^d / w_j$

$$w = A_d w + f_d^*$$

the final equilibrium equation is obtained and used in the text to estimate the impact of the CSF:

$$w = [I - A_d]^{-1} f_d^*$$

The relationship between value added and demand comes from considering the vector that relates value added with effective production v :

$$v = \begin{pmatrix} g_1/w_1 \\ g_2/w_2 \\ \cdot \\ \cdot \\ g_n/w_n \end{pmatrix} = \begin{pmatrix} 1 - \sum a_{i1} \\ 1 - \sum a_{i2} \\ \cdot \\ \cdot \\ 1 - \sum a_{in} \end{pmatrix}$$

and naming \hat{v} the diagonal matrix of these elements,

$$g = \hat{v}w$$

it is possible to estimate the impact of a change in final demand on the value added in the economy, through the following expression:

$$g = \hat{v} [I - A_d]^{-1} f_d^*$$

intermediate imports can be obtained from the expression:

$$m_z = A_m [I - A_d]^{-1} f_d^*$$

and the import coefficients can also be considered:

$$a_{ij}^{m\circ} = z_{ij}^{m\circ} / w_j$$

$$a_{ij}^{mRM} = z_{ij}^{mRM} / w_j$$

so as to distinguish the proportion of imports coming from Spain and abroad.

Finally, once that the change in the regional value added arising from the change in final demand is obtained, it is possible to estimate the number of jobs created or maintained, making use of the 1990 ratio of employment per unit of value added.

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