



Document de treball 2001/1:

**Territorial redistribution through the EU budget
Empirical evidence at national and regional levels**

Marta Espasa

Institut d'Economia de Barcelona
Edifici Florensa
Adolf Florensa, s/n
08028 Barcelona
Tel.: 93 403 46 46
Fax: 93 402 18 13
E-mail: ieb@pcb.ub.es
<http://www.pcb.ub.es/ieb>

TERRITORIAL REDISTRIBUTION THROUGH THE EU BUDGET EMPIRICAL EVIDENCE AT NATIONAL AND REGIONAL LEVELS^{a b}

Marta Espasa^c

ABSTRACT: The purpose of this paper is to estimate the redistributive effects of the European Union budget between 1995 and 1997 on the countries and regions of the EU. This analysis focuses on the main items of revenue, expenditure and net fiscal balance. The method adopted consists of two stages. First, we estimate the income elasticity of European Union revenues, expenditures and fiscal balance in order to examine the progressive degree of each instrument considered. Secondly, we analyse the impact of each of these instruments on regional and national income in order to evaluate their capacity to reduce differences in per capita income levels.

RESUMEN: El objetivo de este artículo es analizar empíricamente la capacidad del presupuesto comunitario para reducir las disparidades territoriales de renta, tanto a nivel de países como de regiones, durante el periodo 1995-97. Dicho análisis se efectúa para los principales conceptos de ingresos y de gastos, así como para el presupuesto en su conjunto a través de los saldos fiscales. El procedimiento metodológico seguido consta de dos fases. En primer lugar, se estima la elasticidad renta de los ingresos, gastos y saldos fiscales comunitarios con el propósito de examinar el grado de progresividad de cada uno de los instrumentos considerados y, en segundo lugar, se analiza el impacto de dichos instrumentos en la renta regional y nacional con el fin de evaluar su capacidad de incidir en la reducción de las disparidades territoriales de renta.

Key words: European Union, fiscal flows, territorial redistribution

JEL classification: F36, H11, H23

^a Comments are welcome. The opinions expressed in the paper do not necessarily reflect the IEB's opinions.

^b Part of this research has been possible thanks to the financial support of the Grup de Recerca Consolidat 1999SGR00017 "Federalisme Fiscal i Economia Regional". I am very grateful to Nuria Bosch and Maria Cubel of the University of Barcelona for their comments and suggestions.

^c Address: Marta Espasa
Dept. Economia Política i Hisenda Pública
Facultat de C. Econòmiques
Avgda. Diagonal, 690, Torre 4, 2^a planta
08034 Barcelona
Tel.: +34.93.402.18.12
Fax.: +34.93.402.18.13
E-mail: mespasa@eco.ub.es

1. INTRODUCTION

During the last decade one of the most hotly debated subjects in economics has been the redistributive capacity of the European Union budget. Among the numerous arguments in favour of active intervention the following stand out: its power to mitigate horizontal equity problems due to the intervention of national governments¹; its capacity to reduce territorial income disparities, or disparities derived from the integration process²; its ability to guarantee the existence of the European Union itself³; and its power to mitigate the negative effects originated by possible asymmetric shocks generated by monetary union^{4 5}.

As a result of this last argument many studies have sought to estimate the redistributive power of the central government in countries such as the United States and Canada (considered as reference points for the European case), since this is one of the requirements established by the monetary optimum areas theory⁶. The results obtained vary considerably, depending on the revenue and expenditure categories taken into account and on the econometric technique used. Thus, while Sala-i-Martin and Sachs (1992) estimate the redistributive power of the United States federal government to be about 40%, Von Hagen (1992) obtains far more restrictive results, around 10%. Adopting an alternative method, Bayoumi and Masson (1995) estimate the regional redistribution capacity of the United States' federal budget at around 22%, and that of Canada at 39%. They conclude that the federal fiscal flows depend on the institutional structure of each country, and that in Europe the spatial redistribution is carried out by the national governments. Moreover, they consider, unlike Sala-i-Martin and Sachs (1992), that the territorial redistributive capacity of the federal governments is more a political option than an economic necessity for the performance of the European Monetary Union.

¹ See Davezies-Nicot-Prud'Homme (1996).

² Among the numerous studies in favour of this argument the most important are the Cecchini Report (1988), Padoa-Schioppa Report (1987) and Emerson et al. (1992).

³ See Cremer and Pestieau (1996).

⁴ Monetary Union supposes not only the transfer of monetary policy to the European Union, but also the existence of substantial limits on fiscal policy established through Stability Programs, which reduce national fiscal autonomy.

⁵ See, for example, Sala-i-Martin and Sachs (1992), Krugman (1993) and Goodhard and Smith (1993).

⁶ See Mundell (1961).

All these studies have led to the development of empirical analyses which, though not aimed at questioning the desirability of European Monetary Union, have estimated the territorial redistribution capacity of the central government in a range of countries. In this regard, Goodhart and Smith (1993) and Domenech-Maudes-Varela (2000) deserve particular mention. Goodhart and Smith adapted the methodology used by Sala-i-Martin and Sachs (1992) and Von Hagen (1992) to the cases of the United States, Canada and Great Britain. They find that in the case of the United States, an increase of one dollar in the GDP of a region means an increase of 13 cents in the federal income taxes collected, and only minor variations in the level of federal expenditure. The insurance capacity of the tax is around 13%⁷. In the case of Canada, the insurance capacity of federal taxes as a whole is 15%, while transfers to families or total transfers do not show any considerable insurance effects. As for the United Kingdom, this study only analyses income tax, obtaining an insurance capacity of 21%.

In their study, Domènech, Maudes and Varela carry out a similar analysis in order to estimate the redistributive effects of the European Union budget on the member countries between 1986 and 1998. They estimate the elasticity of a range of categories of community expenditure and revenue in relation to the income of the member countries through logarithmic regression. The estimation was carried out on a pool of data which included temporal dummy variables in order to analyse simultaneously how changes affect each region each year. The results obtained showed that the redistributive impact of the fiscal flows between the member countries generated by the European Union budget was considerable, particularly given the small size of this budget, and that this redistributive effect has tended to increase over time, due basically to the effects of the structural and cohesion funds. The elasticity of per capita community expenditure estimated in ecus in relation to per capita income is -0.23, which implies a certain degree of progressiveness, whereas revenues behave proportionally as the value of the coefficient is very close to one.

The methodology used by Bayoumi and Masson (1995) was applied by Duboz and Nicot (1998) in analysing the redistributive capacity of the German Federal government,

⁷ Goodhart and Smith (1993) suggest that the differences between the results of their study and those of Sala-i-Martin and Sachs could be due, in part, to the fact that the latter use a much broader variable when considering taxes, whilst they only use personal income tax.

and by Barberán-Bosch-Castells-Espasa (2000) in analysing that of the Spanish central government. In the first case, the results obtained show that the redistributive power of the federal budget is around 40%, and that this percentage remained practically unchanged after the unification process in 1991. In the Spanish case, the regional income redistributive capacity of the central government budget is calculated at about 36%.

Méltiz and Zumer (1998) expanded on this study using a panel econometric data technique to estimate the equation proposed by Bayoumi and Masson. The estimations obtained show that redistribution is substantially greater in France and in the United Kingdom than in the United States and Canada. In France, net transfers (revenue less public expenditure) proceeding from the central government reduce the regional disparities in income by 38%; in the United Kingdom the figure is 26% and in Canada and the United States around 18% and 16% respectively.

Another way to quantify the regional redistributive capacity of the public sector is to use macroeconomic models. This can be done in one of three ways: through simulations on neo-classical models⁸, incorporating fiscal flows in endogenous growth models⁹, or using input-output tables¹⁰.

Though most analyses of this subject have been carried out in the last decade, we should also mention the McDougall Report (1977), the pioneer study in the field, characterised by its rigor and amplitude. This Report analyses the ability of the central governments of France, Italy, the United Kingdom, the Federal Republic of Germany, Australia, Canada, Switzerland and the United States to reduce regional income disparities. The Report draws three significant conclusions. The first is that regional differences in income diminish strongly following the budget activity of the central government. In

⁸ Pisani-Italianer-Lescure (1993) use the simulation method to quantify the insurer effect of the central governments of the United States, Germany and France; Jones and Whaley (1990) analyse the influence of the fiscal flows generated by the federal government of Canada in six regions using a general equilibrium model; and Blake (1995) also uses the macroeconomic simulation method to analyse the regional effects when there are changes in the fiscal and monetary policies of the national government of Great Britain.

⁹ See for example Pereira (1999), where he evaluates the effects of the European Funds in the four cohesion countries.

¹⁰ Pola (1998) analyses the impact of the fiscal flows generated by the central government budget of Italy through input-output regional tables.

fact, the Report estimates that, on average, public sector activity reduces regional differences by 40%, the single-state country budgets showing greater redistributive power than those of federal states (46% in relation to 35%)¹¹. The second major conclusion is that, in general, the redistributive effect of public expenditure is much greater than that of public revenue (35% and 5% on average, respectively). Thirdly, the Report shows the existence of an inverse relationship between the sign and the volume of regional fiscal and trade balances.

Following this line of research, the purpose of this paper is to estimate the redistributive effects of the European Union budget between 1995 and 1997 on European countries and regions. The analysis focuses on the main categories of revenue and expenditure and also on the budget as a whole using the net fiscal balance.

We should stress that the aim of this study is not to analyse whether the European Union should play an active role in spatial redistribution or not, but to estimate the distributive effect generated by its activity. Regardless of whether active intervention in the territorial redistribution area by the European Union is justified, it is obvious that any public budget has distributive effects and, in particular, that any budgetary action, either regarding revenue or expenditure also has distributive effects, even though its objective is not explicitly redistributive¹². For this reason an understanding of the distributive effects at national and regional levels is in itself of interest.

The procedure adopted consists of two stages. Firstly, we estimate the income elasticity of the European Union revenues, expenditures and fiscal balance in order to examine the degree of progressivity of each instrument considered. Secondly, we analyse the impact of these instruments on regional and national income so as to evaluate their capacity to reduce the differences in per capita income levels.

In order to achieve the proposed objectives, the present paper is structured in five sections, this introduction being the first of these. In the second section we explain the

¹¹ In fact, the redistributive power of central governments is estimated to be 29% in the case of Germany, 53% in Australia, 32% in Canada, 28% in the United States, and 22% in Switzerland (in this case social security is not included). With regard to the single-state countries, the results obtained were 54% in the case of France, 47% in Italy, and 36% in the United Kingdom.

¹² See Mc Dougall (1992) and Castells (1998a).

methodology applied, while in the third we describe the characteristics of the data used. In the fourth we estimate the redistributive effects of the budget of the European Union, and present our main conclusions in the fifth and last section.

2. METHODOLOGY

The methodology used to analyse the redistributive effects of the European Union budget combines the elasticities method introduced by McDougall (1977) and the disposable income method developed by Bayoumi and Masson (1995).

Thus, first we estimate the elasticity-income of the regional and national European Union revenues, expenditures and fiscal balance so as to examine the progression of each instrument considered.

Following the McDougall report (1977), the coefficients of elasticity are obtained by regression, where regional and national taxes and expenditure are the dependent variables and the initial income is the independent variable. Initial income is defined as the income existing before the activity of the public sector. The difference between our method and that used by McDougall is that we take the variables as logarithms. Consequently, the coefficients of the slopes are the estimated elasticities.

The estimated equation is:

$$\ln \frac{X_i^j}{X_m^j} = a + b \ln \frac{Y_i}{Y_m} + e_i \quad (1)$$

where,

X is the taxes or expenditures in each region in per capita terms.

Y is the initial income of the regions (or countries) in per capita terms.

j refers to different types of revenue and expenditure.

i refers to the regions (or countries).

m refers to average values for the total of regions (or countries).

The variables used are average values for the period 1995-97.

As the reader may have noticed, this method is very similar to the one used by Sala-i-Martin and Sachs (1992). However, they used time series in their estimations, while we use cross-section data.

The elasticities obtained indicate the change in regional (or national) revenues and expenditures when the regional (or national) income changes. If the slope is equal to one, the tax or expenditure is neutral, which means that it varies from one region (or country) to another in the same proportion as the initial income. Consequently, these fiscal instruments do not modify the initial differences in relative regional (or national) income. Taxes with elasticities above one are progressive, while expenditures with elasticities above one are regressive.

In the case of fiscal balances, the elasticity-income is estimated using the equation developed by Castells (1998a), where the dependent variable is the ratio between fiscal balance and regional (or national) income. We add one to this ratio to avoid negative values. Thus, we estimate the following equation:

$$\ln \left(1 + \frac{SF_i}{Y_i} \right) = a + b \ln \frac{Y_i}{Y_m} + e_i \quad (2)$$

where

SF is the regional (or national) fiscal balance with the European Union budget.

Once the degree of progressivity of the various instruments of revenues, expenditures and fiscal balance is analysed, we study its redistributive capacity, which depends not only on the degree of progressivity but also on its relative importance in the regional (or national) income. It may be that an revenue or expenditure item is very progressive but that its importance in regional (or national) income is very small. In this case, the redistributive effect of this instrument is very low. Likewise, an revenue or expenditure item may not be very progressive but its importance in regional (or national) income is large; in this case the redistributive effect may be greater. Therefore, it is necessary to consider the progressivity of the instruments and their involvement in reducing territorial income disparities.

For the analysis of this second aspect we use the method developed Bayoumi and Masson (1995). Using cross-section regression analysis we estimate the following equation:

$$\frac{YF_i}{YF_m} = \alpha + \beta \frac{Y_i}{Y_m} + e_i \quad (3)$$

where

Y is the initial income, in other words, the income existing before the activity of the public sector, in our case the European Union. We use Gross Domestic Product (GDP) as the initial income since it is the primary magnitude of income for the European regions.

YF is the final income, which is equal to the initial income (Y) modified by the activity of the European Union. To obtain the final income, revenue obtained by the public sector is subtracted from the initial income and public expenditure is added.

i refers to regions or countries.

m refers to average values for all regions or countries.

The variables Y and YF are average values in per capita terms for the 1995-97 period.

The estimated value for the coefficient “ β ” indicates the relationship between the final income (YF) and the initial income (Y) and is understood in redistributive terms. For example, a coefficient of 0.70 indicates that 70 percent of the initial differences in relative per capita incomes remains after public sector activity, and that this reduces 30% of each ecu of difference between the regions or the countries. Therefore, $(1-\beta)$ represents the amount of income redistribution caused by fiscal flows derived from the European Union budget.

The estimation of equation (3) was carried out starting from the following calculations of the final income:

- $YF = Y - \text{European Union Revenue}$ (distinguishing between the various typologies of revenues). The value $(1-\beta)$ shows the redistributive power of public revenue as a whole and its different categories.

- $YF = Y + \text{European Union Expenditures}$ (also distinguishing the larger categories of public expenditure). The value $(1-\beta)$ indicates the redistribution derived from total public expenditure and from its main categories.
- $YF = Y + \text{Regional or National Fiscal Balance}$ with the European Union. In this case, the value of $(1-\beta)$ indicates the total redistributive power of the European Community budget.

3. DATA CHARACTERISTICS

The data used in this study relating to revenue and expenditure, as well as to fiscal balances, were taken from a previous study carried out by the author. Fiscal flows derived from the activity of the European Union in the 15 member states and in the 121 regions during the 1995-97 period were quantified¹³. In this study the territorial data for income and expenditure are the result of the estimation of the territorial incidence of the resources and the expenditure of the European Union. The territorial assignment carried out is based on economic incidence and it uses information from the Annual Reports of the Court of Auditors. Specifically, we use effective revenues and payments made.

3.1. Territorial assignment of the revenues

Revenues are assigned territorially using the existing methodology which is based on the hypotheses of tax incidence most suitable for each of the types of revenue. Hence, we distributed total revenue between territories using the most appropriate statistical indicators corresponding with these hypotheses of tax incidence. This procedure is necessary, due to the possibility of ‘shifting’ the tax burden between individuals, which means that the collection of taxes in a certain area does not necessarily correspond to the taxes paid by its residents.

The hypotheses of the tax burden incidence established to assign the revenue of the European Union territorially are those commonly used in the majority of theoretical and empirical studies. Below, the hypotheses (of tax incidence) that we use to distribute revenues between countries and regions are briefly outlined:

¹³ See Espasa (2000).

- *Net Traditional Resources*. These resources include customs duties, agricultural duties and sugar and isoglucose levies less their collection costs. It is considered that these taxes are passed to the final consumer in the price, and therefore it is the consumer that has to support the tax burden. Consequently, total revenues by traditional resources have been distributed among regions and countries according to the final consumption of households and not according to the revenue collected in each area.
- *VAT resources* are the direct contribution of the member states to the European Union. Consequently we have supposed that there is no shifting of the tax burden between countries. However, the contribution by VAT inside each State is assumed to be borne by consumers to the extent that they suffer the tax burden. Thus, we have assigned the effective contribution to each country, and this contribution has been distributed among regions according to the regional distribution of national consumption.
- The *GNP resource* is also a direct transfer from member states to the European Union; so we have considered that the tax burden of this resource is totally internalized inside each member State. Therefore, each country is assigned its effective contribution, and this contribution has been assessed among the European regions as a function of the regional distribution of the tax burden state to be borne.
- Finally, the revenues obtained through salary taxes on the Community Institutions' personnel have been distributed among countries and regions according to territorial distribution of the administrative expenditure.

3.2. Territorial assignment of expenditure

The analysis of the territorial assignation of public expenditure is as important as that of revenues, but its estimation has not been as widely studied and it is more difficult to carry out. According to Castells (1998b), the reason is that public expenditure, as it is directed towards the production of services for their public provision, produces two different effects. On the one hand, it finances services that are provided to consumers without compensation and, on the other hand, it makes payments to acquire the necessary resources (labour, supplies, equipment, installations, etc.) to produce those public services. The first is a unilateral effect, without compensation, typical of the public sector. The second is a bilateral effect, with compensation, as the recipients of the payments always deliver something in exchange.

Consequently, studies of territorial aspects of expenditure can focus on either the geographical location of the expenditure, or the place of residence of the individuals that benefit from the service provided. The former is called the flow approach, and the latter the determining benefit approach.

The approaches are not mutually exclusive, but they address different questions. The purpose of the flow approach is to analyse the effect of expenditure on the economic activity of the territory where the public goods and services are provided. The benefit approach quantifies the impact of public consumption (public goods or public services). Consequently, the territorial assignment of the Community's expenditure among countries and regions is made following these two criteria.

The usual practice in the territorial assignation of expenditure, in the flow approach, is based on attributing the public expenditure to the region in which the expenditure materialises, that is where the personnel, the use of current goods and services, the receipt of the transfers and the investments are located. This is the criterion that we applied. Hence we gave the flow approach a sense of 'reality', instead of giving it a sense of 'cash flows', which would have led us to attribute the public expenditure to the region in which the Administration makes its payment.

Following this approach, the territorial assignation of public expenditure can be relatively straightforward in that there is an accounting system which would allow all categories of expenditure to be regionalised. When this happens the territorial assignation of the expenditure is direct and immediate. Otherwise, it is necessary to establish hypotheses about the territory where the expenditure is made and to select the most suitable statistical indicators. Specifically, using this approach the expenditure is assigned to the territory where the personnel are located, the purchase of current goods and services are ascribed to the territory in which they are used (not where they are acquired), investments in the region where they materialise, and transfers to the territory where their final recipients reside.

The Annual Reports of the Court of Auditors provides information concerning expenditure in the member states. However, regional information is only available for expenditure on structural actions. Therefore, we need to establish some hypotheses to determine the assignation of the remaining regional expenditures.

If we adopt the benefit approach, the assignation of community expenditure depends on where the beneficiary resides, regardless of the allocation of the public production and public investment. We will also establish a number of assumptions about the allocation of the beneficiaries and about the quantification of the benefits that beneficiaries receive. Finally, it is necessary to select the statistical indicators that most reliably represent the beneficiaries of public goods and services.

In short, the territorial distribution of the major items of European Union expenditure has been carried out following the criteria described below:

- The administrative expenditures of the European Union are the only expenditure category for which the Court of Auditors does not provide a break down of information for each member state. This is because the Court considers administrative expenditure to be indivisible and to produce external effects that affect the population as a whole. However, the Commission did produce a Report where the geographical distribution of the administrative expenditures corresponding to the fifth draft of the financial perspectives were assigned to each of the member states. This distributive rule has been used in assigning the

administrative expenditures according to countries following the flow approach. The breakdown of this expenditure by regions is carried out following the distribution of the personnel of the various Community Institutions.

In contrast, when adopting the benefit approach we considered that these expenditures finance a public good for the whole community, since they produce indivisible profits and external effects that reach the population as a whole. Consequently, the benefit approach distributes these expenditures among countries and regions as a function of their population.

- The results of the territorial assignation of European Agricultural Guidance and Guarantee Fund (EAGGF) following the benefit approach coincide with the results obtained using the flow approach. These results coincide because the finality of this fund is to guarantee the income of farmers and we, therefore, suppose farmers to be the direct beneficiaries of these transfers. The territorial distribution of this expenditure by member state is obtained directly from the Financial Report of EAGGF, while the regional distribution can be obtained by applying the criteria of intervention for each subsidised product, such as the area under cultivation, production, number of heads of cattle, etc..
- In considering the territorial impact of expenditure for structural action, we have also assumed that the results provided by both approaches are the same. In this case, we consider the benefits from these actions to remain within the territory which receives the transfers. Obviously, the projects being financed might have external effects even though they are located in another region. However, in practice it is extremely difficult to determine the type of projects being financed in each region and the extent of EU involvement. Clearly, this information is essential in establishing a hypothesis of the incidence of possible "overflow" effects.

Information about payments made by the European Union in every country and region is available, consequently in most cases the expenditure can be assigned directly. In the remaining cases indicators related with the objectives of these expenditures have been used.

- Finally, when we consider the rest of the European Union's expenditures including expenditure on research and development, external affairs and international aid programmes and on the rest of internal policies the results obtained with both approaches differ greatly. The reason for this is that these actions generate benefits that, in general, affect the whole population. Therefore, following the benefit approach population distribution is one of the main indicators of allocation. However, in the case of the flow approach, the expenditure corresponding to these policies is assigned to the territory for which it was originally intended.

4. ESTIMATES AND RESULTS

4.1. The redistributive power of European Union revenue

Our analysis of the redistributive capacity of community revenue was undertaken for five categories of revenue: Traditional Own Resources (OWN), VAT resources (including the resources originated by VAT, the excess revenues of previous budgets by VAT and the British check or compensation), GNP Resources (corresponding to revenues by this resource and the excess of previous budgets by GNP contribution), Own Resources (OR) (defined as the aggregate of the three revenue categories above ($OR = TOR + VAT + GNP$)) and Total revenues (TR) (determined as the sum of own resources plus the “other revenues”, which basically are taxes on salaries of the community personnel ($TR = OR + other\ revenues$)).

We have not been able to estimate the elasticity of “other revenues” because the number of observations when values differed from zero was very low. Nevertheless, its effect can be analysed using the difference between the elasticity of own resources and the elasticity of total revenues.

The elasticity of the European Union revenues for 1995-97 period has been estimated using equation (1). The results are shown in table 1, which is divided in two parts, one corresponding to the regional sample and the other to the country sample. Both estimates have been carried out with the variables in ecus and PPS.

All the estimated income elasticities in the regional sample have a value lower than the unity. Thus, the regressivity of the community revenues are shown as a composite set and individually while the estimates were found to be lower when the variables are in PPS. Specifically, the estimated income elasticity of total revenues is 0.969 when all variables are expressed in ecus and 0.876 when they are in PPS. In the national sample, the income elasticity of total revenues is higher than one (1.210 in ecus and 1.551 in PPS). Therefore, it is possible to affirm that the financial system of the European Union has a certain degree of progressivity at the national level, while it is slightly regressive when it is analysed at the regional level.

If we examine different types of revenue, we should note that the VAT resource is regressive in the regional sample, while it appears progressive in the national sample. This outcome responds to the logic of the financial system, which in the last decade has shown a reduction in its regressivity. This has been achieved through the reduction of the maximum tax rate and also by changing the structure of the VAT resource (limitation of its tax base and financing the British compensation through GNP). However, those reductions are only undertaken at the national level and they do not affect the regions. The GNP resource is the type of revenue that shows an income elasticity closest to one both in the regional sample ($b = 0.975$ when the variables are expressed in ecus and $b = 0.949$ in PPS), and in the national sample (in this case, its elasticity is 0.983 in ecus and 1.003 in PPS). In contrast, the traditional own resources has an elasticity greater than one. Clearly, they are regressive in the two samples analysed.

The sum of traditional own resources, VAT resource and GNP resource constitutes own resources. The income elasticity of these resources is quite low in the regional sample ($b = 0.891$ in ecus and $b = 0.742$ in PPS) and it increases to 0.965 and 0.968, respectively, in the national sample. Finally, it can be seen that taxes on personnel wages assigned to Institutions of the Community are the most progressive. This result is due to the difference in the elasticities of own resources and total revenues.

Table 1
Estimation of the income elasticity of European Union revenues

Dependent variables	Variables in ECUS			Variables in PPS		
	Constant	Ind. V.: $\ln(Y_i/Y_m)$ Coefficient b	R ²	Constant	Ind. V.: $\ln(Y_i/Y_m)$ Coefficient b	R ²
a) Regional sample (n = 118)						
$\ln(T_i^{OWN}/T_m^{OWN})$	-0.005 (-0.37)	0.750 (23.29)***	0.82	-0.002 (-0.14)	0,598 (13,99)***	0.63
$\ln(T_i^{VAT}/T_m^{VAT})$	-0.003 (-0.08)	0.926 (11.41)***	0.53	-0.013 (-0.40)	0,712 (6,29)***	0.25
$\ln(T_i^{GNP}/T_m^{GNP})$	-0.022 (-1.27)	0.975 (23.04)***	0.82	-0.017 (-0.98)	0,949 (15,75)***	0.68
$\ln(T_i^{OR}/T_m^{OR})$	0.002 (0.12)	0.891 (22.65)***	0.82	-0.001 (-0.04)	0,742 (14,05)***	0.63
$\ln(T_i^{TR}/T_m^{TR})$	0.022 (1.04)	0.969 (19.01)***	0.76	0.021 (1.00)	0,876 (12,16)***	0.56
b) National Sample (n = 15)						
$\ln(T_i^{OWN}/T_m^{OWN})$	-0.067 (-2.29)**	0.816 (10.64)***	0.90	-0.059 (-1.98)*	0.704 (5.10)***	0.67
$\ln(T_i^{VAT}/T_m^{VAT})$	0.030 (0.65)	1.016 (8.50)***	0.85	0.036 (0.78)	1.037 (4.97)***	0.66
$\ln(T_i^{GNP}/T_m^{GNP})$	0.009 (0.598)	0.983 (25.32)***	0.98	0.015 (1.02)	1.003 (14.60)***	0.94
$\ln(T_i^{OR}/T_m^{OR})$	0.010 (0.39)	0.965 (14.88)***	0.84	0.016 (0.65)	0.968 (8.47)***	0.85
$\ln(T_i^{TR}/T_m^{TR})$	0.067 (1.08)	1.210 (7.43)***	0.81	0.071 (1.26)	1.551 (5.95)***	0.73

OWN: Traditional Own Resources

VAT: VAT Resources

GNP: GNP Resources

OR: Own Resources

TR: Total Revenues

i : regions or countries

m: average of the regions or countries

Terms in brackets are *t*-statistics values

*** indicates a parameter significant at the 99% confidence level

** indicates a parameter significant at the 95% confidence level

* indicates a parameter significant at the 90% confidence level

The redistributive power of the community's revenue can be analysed using equation (3) and adjusting the final income as follows:

$$YF = Y - \text{Community Revenue} \quad (4)$$

The results obtained are shown in table 2.

The redistributive effect of total revenue at regional level is very small: 0.26% when variables are in ecus and 0.27% when they are in PPS. This outcome is due exclusively to "other revenues", since own resources (traditional own resources, VAT resources and GNP resources) widen regional income differences. Thus, the global effect is an increase of regional disparities of -0.11% and 0.25%, depending on whether variables are expressed in ecus or PPS.

The results of the redistributive power of revenues by country differ considerably. Here, except for traditional own resources, the rest of revenues show a certain redistributive capacity, with VAT having the greatest impact. Its redistributive power is 0.15% and 0.22%, respectively. The redistributive effect of total revenue among countries is 1.37% when variables are in ecus and 2.45% when they are in PPS. These are higher values than those obtained in the regional sample. Obviously, these results are in line with the income elasticity estimations obtained previously. Consequently, it can be deduced that the financing community system is more able to redistribute among countries than among regions.

Table 2
The redistributive power of European Union revenues

Dependent Variable: Final income (YF_i/YF_m)	Variables in ECUS				Variables in PPS			
	Constant	Indep.V.: Y_i/Y_m Coefficient β	R ²	%(1- β)	Constant	Indep.V.: Y_i/Y_m Coefficient β	R ²	%(1- β)
a) Regional sample (n = 118)								
Y – OWN	-0.001 (-7.86)***	1.0006 (135566)***	1.00	-0.06	-0.001 (-9.61)***	1.0008 (11364.9)***	1.00	-0.08
Y – VAT	-0.005 (-1.62)	1.0003 (3497)***	1.00	-0.03	-0.002 (-4.22)***	1.0015 (2692.1)***	1.00	-0.15
Y- GNP	-0.001 (-1.12)	1.0001 (12089)***	1.00	-0.01	-0.000 (-1.14)	1.0002 (7884.2)***	1.00	-0.02
Y- OR	-0.001 (-3.13)**	1.0011 (2736)***	1.00	-0.11	0.003 (-5.62)***	1.0025 (2183.2)***	1.00	-0.25
Y – Total Revenues	0.002 (1.51)	0.9974 (842.7)***	1.00	0.26	0.002 (1.28)	0.9973 (655.3)***	1.00	0.27
b) National sample (n = 15)								
Y – OWN	-0.000 (-1.53)	1.0004 (6522.1)***	1.00	-0.04	-0.001 (-1.74)	1.0006 (3959.0)***	1.00	-0.06
Y – VAT	0.001 (1.53)	0.9985 (1382.3)***	1.00	0.15	0.002 (1.60)	0.9978 (883.4)***	1.00	0.22
Y- GNP	0.000 (0.80)	0.9998 (7120.2)***	1.00	0.02	3.059 (1.41)	0.9996 (4823.9)***	1.00	0.04
Y- OR	0.001 (1.18)	0.9988 (1196.0)***	1.00	0.12	0.002 (1.31)	0.9981 (781.1)***	1.00	0.20
Y – Total Revenues	0.012 (2.13)**	0.9863 (192.2)***	1.00	1.37	0.023 (3.61)**	0.9755 (160.9)***	1.00	2.45

OWN: Traditional Own Resources

VAT: VAT Resources

GNP: GNP Resources

OR: Own Resources

TR: Total Revenues

i : regions or countries

m: average of the regions or countries

Terms in brackets are *t*-statistics values

*** indicates a parameter significant at the 99% confidence level

** indicates a parameter significant at the 95% confidence level

* indicates a parameter significant at the 90% confidence level

4.2. The redistributive power of European Union expenditure

The estimation of the income elasticity of expenditures can be carried out using equation (1) and by analysing four categories of expenditure: the expenditure derived from the EAGGF (AGR), the expenditure on structural actions (STR), the expenditure on research and development (R+D), and other internal policy expenditure (IP), where expenditure on external affairs and administrative expenditure are included. Finally, we also estimate the income elasticity for the whole of the community expenditure.

The redistributive power analysis has been carried out using the flow approach and the benefit approach. Table 3 and 4 show the estimates of the income elasticities of expenditures following the flow approach and the benefit approach, respectively.

Income elasticity values higher than one mean that expenditures are regressive, since an increase in the share of regional income increases more than proportionally the expenditure in that region with respect to the community average. In contrast, elasticities lower than one mean that these expenditures are progressive.

Our results show that income elasticity for the whole of the community expenditure in the regional sample is always negative and, therefore, we can say that expenditure is progressive. This result is the same when applying the flow or the benefit approach and whether calculated in ecus or PPS. Specifically, the income elasticity of total expenditure when we use the flow approach is -1.061 in ecus and -1.901 in PPS, and it is -1.294 and -2.248 when we use the benefit approach. Thus, it was observed that expenditure was more progressive when applying the latter approach.

The coefficient of income elasticity under the flow approach is not statistically significant in the national sample. On the other hand, when the estimation is carried out following the benefit approach the coefficient has values that are clearly significant and negative ($b=-0.800$ if the variables are in ecus and $b=-2.082$ if they are in PPS). Hence, European Union expenditure is progressive when it is assigned according to the benefit approach.

The most progressive expenditures in both samples are derived from structural actions. Estimated coefficient is -2.519 and -3.886 in the regional sample, depending on whether variables are defined in ecus or in PPS, and -1.947 and -3.648 in the national sample. In this case, the results derived from applying the flow and benefit approach coincide, since it is considered that the benefits remain inside the territory where the expenditures are destined. The agricultural expenditure coefficient is, in all cases, lower than the unity, while in the member states the sample is not statistically significant. At the regional level it is progressive but the coefficients are smaller ($b = -1.182$ in ecus and $b = -2.346$ in PPS) than those obtained for structural expenditures.

Expenditure in research and development is regressive in both samples when income elasticities are estimated according to the flow approach. However, when this expenditure is territorialized under the benefit approach it becomes slightly progressive. Expenditures associated with the rest of internal policies are statistically unreliable, because the values of R are extremely low. Consequently, the explanatory capacity of the model is low. Having said this though, it should be realised that the coefficient of the estimated elasticity is lower than unity under both approaches when using the regional sample, while in the national sample, these expenditures are highly regressive.

Table 3
Estimation of the income elasticity of European Union expenditures
Flow approach

Dependent variables	Variables in ECUS			Variables in PPS		
	Constant	V.ind.: ln (Y _i /Y _m) Coefficient b	R ²	Constant	V.ind.: ln (Y _i /Y _m) Coefficient b	R ²
<i>a) Regional sample (n = 118)</i>						
$\ln (G_i^{AGR} / G_m^{AGR})$	-0.441 (-3.89)**	-1.182 (-4.29)***	0.14	-0.436 (-4.05)***	-2.346 (-6.22)***	0.25
$\ln (G_i^{STR} / G_m^{STR})$	-0.611 (-8.36)***	-2.519 (-14.17)***	0.63	-0.548 (-6.92)***	-3.886 (-14.01)***	0.63
$\ln (G_i^{R+D} / G_m^{R+D})$	-0.410 (-5.68)***	1.005 (5.73)***	0.22	-0.374 (-5.29)***	1.399 (5.65)***	0.22
$\ln (G_i^{IP} / G_m^{IP})$	-1.044 (-8.29)***	0.908 (2.96)***	0.07	-1.031 (-8.25)***	0.947 (2.17)**	0.04
$\ln (G_i^{TE} / G_m^{TE})$	-0.127 (-1.68)*	-1.061 (-5.77)***	0.22	-0.094 (-1.23)	-1.901 (-7.11)***	0.30
<i>b) National sample (n = 15)</i>						
$\ln (G_i^{AGR} / G_m^{AGR})$	0.045 (0.26)	-0.397 (-0.89)	0.06	0.068 (0.41)	-1.556 (-2.07)*	0.25
$\ln (G_i^{STR} / G_m^{STR})$	-0.203 (-1.22)	-1.947 (-4.46)***	0.61	-0.146 (-0.68)	-3.648 (-3.73)***	0.52
$\ln (G_i^{R+D} / G_m^{R+D})$	0.127 (0.74)	1.123 (2.49)**	0.32	0.126 (0.76)	1.766 (2.32)**	0.29
$\ln (G_i^{IP} / G_m^{IP})$	0.163 (0.40)	2.515 (2.37)**	0.30	0.151 (0.39)	4.340 (2.46)**	0.32
$\ln (G_i^{TE} / G_m^{TE})$	0.354 (1.54)	0.139 (0.23)	0.00	0.378 (1.56)	0.203 (0.18)	0.00

AGR: EAGGF-Guarantee

STR: Structural Actions

R+D: Research and Development

IP: Internal Politics (include also administrative expenditures and external affairs)

TE: Total Expenditures

i : regions or countries

m: average of the regions or countries

Terms in brackets are *t*-statistics values

*** indicates a parameter significant at the 99% confidence level

** indicates a parameter significant at the 95% confidence level

* indicates a parameter significant at the 90% confidence level

Table 4
Estimation of the income elasticity of European Union expenditures
Benefit approach

Dependent variables	Variables in ECUS			Variables in PPS		
	Constant	V.ind.: $\ln(Y_i/Y_m)$ Coefficient b	R ²	Constant	V.ind.: $\ln(Y_i/Y_m)$ Coefficient b	R ²
a) Regional sample (n = 118)						
$\ln(G_i^{AGR} / G_m^{AGR})$	-0.441 (-3.89)***	-1.182 (-4.29)***	0.14	-0.436 (-4.05)***	-2.346 (-6.22)***	0.25
$\ln(G_i^{STR} / G_m^{STR})$	-0.611 (-8.36)***	-2.519 (-14.17)***	0.63	-0.548 (-6.92)***	-3.886 (-14.01)***	0.63
$\ln(G_i^{R+D} / G_m^{R+D})$	0.010 (6.05)***	0.223 (53.34)***	0.96	0.032 (2.48)**	-0.000 (-0.00)	0.00
$\ln(G_i^{IP} / G_m^{IP})$	-0.063 (-4.54)***	0.024 (0.70)	0.00	-0.036 (-1.66)*	-0.249 (-3.31)***	0.09
$\ln(G_i^{TE} / G_m^{TE})$	-0.161 (2.96)***	-1.294 (-9.80)***	0.45	-0.132 (-2.39)*	-2.248 (-11.62)***	0.54
b) National sample (n = 15)						
$\ln(G_i^{AGR} / G_m^{AGR})$	0.045 (0.26)	-0.397 (-0.89)	0.057	0.068 (0.41)	-1.556 (-2.07)*	0.25
$\ln(G_i^{STR} / G_m^{STR})$	-0.203 (-1.22)	-1.947 (-4.46)***	0.61	-0.146 (-0.68)	-3.648 (-3.73)***	0.52
$\ln(G_i^{R+D} / G_m^{R+D})$	0.013 (3.13)***	0.233 (22.16)***	0.97	0.026 (0.92)	-0.255 (-1.94)*	0.22
$\ln(G_i^{IP} / G_m^{IP})$	0.165 (1.68)	0.395 (1.53)	0.15	0.176 (1.86)*	-0.151 (-0.35)	0.01
$\ln(G_i^{TE} / G_m^{TE})$	0.117 (0.96)	-0.800 (-2.51)**	0.33	0.144 (1.14)	-2.082 (-3.59)***	0.50

AGR: EAGGF-Guarantee

STR: Structural Actions

R+D: Research and Development

IP: Internal Politics (include also administrative expenditures and external affairs)

TE: Total Expenditures

i : regions or countries

m: average of the regions or countries

Terms in brackets are *t*-statistics values

*** indicates a parameter significant at the 99% confidence level

** indicates a parameter significant at the 95% confidence level

* indicates a parameter significant at the 90% confidence level

Tables 5 and 6 show the redistributive power of the whole of community expenditure and their main categories, using the flow approach and the benefit approach respectively. In the calculation, the estimation of equation (3) was carried out obtaining the final income as follows:

$$YF = Y + \text{Community expenditures} \quad (5)$$

The estimations made show that the community expenditure at the regional level presents a redistributive effect of 1.59%, when the assignment of expenditure is made according to the flow approach and variables are expressed in ecus and 5.84%, when the territorial assignment is carried out under the benefit approach and the data are defined in PPS. At the level of member states, expenditure taken as a whole is only significant when its territorial imputation is calculated according to benefit flow. In this case, the redistributive effect is 2.55% when the variables are defined in ecus and 4.51% in PPS.

Different results were obtained depending on the approach followed because of the variation in research and development expenditure and, especially, in that of internal policy expenditure. According to the flow approach both expenditures present a negative redistributive power, the estimated value of which is -5.60% in ecus and -10.03% in PPS. Under the benefit approach they have little redistributive capacity: 0.07% in ecus and 0.17% in PPS. We obtained similar results although less intense when using the regional sample. This is due to the relative size of the samples and to the fact that these expenditures have a significant weight in countries such as Luxembourg and Belgium unlike the rest of the member states.

The expenditure with the greatest regional redistributive capacity (2.29% and a 3.90% depending on whether variables are expressed in ecus or in PPS) is that made on structural actions. Agricultural expenditure occupies the second place with a redistributive power of 1.11% and 1.75%. The same behaviour is shown by these two categories of expenditure at the national level. Moreover these expenditures are always more redistributive when using variables expressed in PPS than when they are defined in ecus.

Table 5
The redistributive power of European Union expenditure
Flow approach

Dependent Variable : Final income (YF_i/YF_m)	Variables in ECUS				Variables in PPS			
	Constant	Indep.V.: Y_i/Y_m Coefficient β	R ²	%(1- β)	Constant	Indep.V.: Y_i/Y_m Coefficient β	R ²	%(1- β)
<i>a) Regional sample (n = 118)</i>								
Y + AGR	0.012 (7.50)***	0.9889 (600.9)***	1.00	1.11	0.019 (7.99)***	0.9825 (403.7)***	1.00	1.75
Y + STR	0.025 (6.37)***	0.9771 (248.1)***	1.00	2.29	0.042 (5.39)***	0.9610 (119.8)***	1.00	3.90
Y + (R+D)	-0.0002 (-1.79)*	1.0001 (10646.5)***	1.00	-0.01	-0.000 (-3.17)***	1.0003 (8469.6)***	1.00	-0.04
Y + IP	-0.015 (-3.05)***	1.0180 (212.373)***	1.00	-1.80	-0.022 (-3.75)***	1.0252 (172.7)***	1.00	-2.52
Y + Total Expenditure	0.022 (3.35)***	0.9841 (146.308)***	1.00	1.59	0.0389 (3.62)***	0.9691 (88.0)***	0.99	3.09
<i>b) National sample (n = 15)</i>								
Y + AGR	0.012 (2.31)**	0.9900 (208.2)***	1.00	1.00	0.021 (2.29)**	0.9822 (114.4)***	1.00	1.78
Y + STR	0.017 (4.58)***	0.9853 (297.7)***	1.00	1.47	0.029 (3.61)**	0.9747 (129.0)***	1.00	2.53
Y + (R+D)	-0.001 (-1.52)	1.0009 (2360.3)***	1.00	-0.09	-0.002 (-2.89)*	1.0017 (1945.3)***	1.00	-0.17
Y + IP	-0.049 (-2.24)**	1.0560 (53.6)***	1.00	-5.60	-0.093 (-4.00)***	1.1003 (49.3)***	0.99	-10.03
Y + Total Expenditure	-0.020 (-0.83)	1.0318 (46.6)***	0.99	-3.18	-0.045 (-1.38)	1.0582 (33.8)***	0.99	-5.82

AGR: EAGGF-Guarantee

STR: Structural Actions

R+D: Research and Development

IP: Internal Politics (include also administrative expenditures and external affairs)

TE: Total Expenditures

i : regions or countries

m: average of the regions or countries

Terms in brackets are *t*-statistics values

*** indicates a parameter significant at the 99% confidence level

** indicates a parameter significant at the 95% confidence level

* indicates a parameter significant at the 90% confidence level

Table 6
The redistributive power of European Union expenditure
Benefit Approach

Dependent Variable : Final income (YF_i/YF_m)	Variables in ECUS				Variables in PPS			
	Constant	Indep.V.: Y_i/Y_m Coefficient β	R^2	$\%(1-\beta)$	Constant	Indep.V.: Y_i/Y_m Coefficient β	R^2	$\%(1-\beta)$
<i>a) Regional sample (n = 118)</i>								
Y + AGR	0.012 (7.50)***	0.9889 (600.9)***	1.00	1.11	0.019 (7.99)***	0.9825 (403.7)***	1.00	1.75
Y + STR	0.025 (6.37)***	0.9771 (248.1)***	1.00	2.29	0.042 (5.39)***	0.9610 (119.8)***	0.99	3.90
Y + (R+D)	0.000 (3284.6)***	0.9997 (9858700)***	1.00	0.03	0.000 (21.66)***	0.9996 (47135.5)***	1.00	0.04
Y + IP	0.001 (16.1)***	0.9986 (11673.8)***	1.00	0.14	0.002 (13.29)***	0.9981 (6858.5)***	1.00	0.19
Y + Total Expenditure	0.039 (9.01)***	0.9645 (223.7)***	1.00	3.55	0.063 (7.50)***	0.9416 (109.3)***	0.99	5.84
<i>b) National sample (n = 15)</i>								
Y + AGR	0.012 (2.31)**	0.9900 (208.2)***	1.00	1.10	0.021 (2.29)**	0.9822 (114.4)***	1.00	1.78
Y + STR	0.017 (4.58)***	0.9854 (297.7)***	1.00	1.47	0.029 (3.61)**	0.9747 (129.0)***	1.00	2.53
Y + (R+D)	0.000 (4509)***	0.9997 (15122778)***	1.00	0.03	0.000 (8.65)***	0.9995 (16535.6)***	1.00	0.05
Y + IP	0.001 (1.49)	0.9993 (1467.9)***	1.00	0.07	0.002 (2.28)**	0.9983 (1110.8)***	1.00	0.17
Y + Total Expenditure	0.030 (3.80)***	0.97455 (136.1)***	1.00	2.55	0.051 (3.45)**	0.9550 (67.1)***	1.00	4.51

AGR: EAGGF-Guarantee

STR: Structural Actions

R+D: Research and Development

IP: Internal Politics (include also administrative expenditures and external affairs)

TE: Total Expenditures

i : regions or countries

m: average of the regions or countries

Terms in brackets are *t*-statistics values

*** indicates a parameter significant at the 99% confidence level

** indicates a parameter significant at the 95% confidence level

* indicates a parameter significant at the 90% confidence level

4.3. Global redistributive power of the European Union Budget

Following the same procedure as with community revenue and expenditure, we first examined the income elasticity of the fiscal balance, since this variable reflects the territorial effects of the global activity of the European Union Budget. The regional fiscal balance was obtained from the difference between the expenditure made (entry of resources) and the income obtained (exit of resources) by the European Union in each region and country.

The analysis of the fiscal balance uses both the flow and the benefit approach to impute expenditures among territories. The results of the estimation of equation (2) are shown in Table 7. In this case, the coefficients of the independent variables represent the income elasticities of the fiscal balance generated by the community budget. If the coefficient is negative then the whole of community budget is progressive since a proportional increase in income reduces the share of fiscal balance more than proportionally, while it is regressive when the estimated coefficient is positive.

The results of the estimations show that the regional fiscal balance derived from the activity of the European Union is progressive, both when the analysis is conducted according to the flow approach (-0.062 in ecus and -0.079 in PPS) and when following the benefit approach (-0.071 in ecus and -0.0094 in PPS). The same is true when the income elasticity of the fiscal balance is examined by member states. However, the magnitude of this elasticity is lower and is not statistically significant when the fiscal balance is calculated following the flow approach.

Table 7

Estimation of the income elasticity of the fiscal balance generated by the European Union budget

Dependent Var.	Variables in ECUS			Variables in PPS		
	Constant	Ind. V.: $\ln(Y_i/Y_m)$ Coefficient b	R ²	Constant	Ind. V.: $\ln(Y_i/Y_m)$ Coefficient b	R ²
<i>a) Regional sample (n = 118)</i>						
$\ln(1 + SF_i^{FM} / Y_i)$	0.003 (0.85)	-0.0621 (-6.62)***	0.27	0.005 (1.22)	-0.079 (-5.67)***	0.22
$\ln(1 + SF_i^{FB} / Y_i)$	0.002 (0.51)	-0.0712 (-8.00)***	0.36	0.0034 (0.897)	-0.094 (-7.05)***	0.30
<i>b) National sample (n = 15)</i>						
$\ln(1 + SF_i^{FM} / Y_i)$	0.010 (1.98)*	-0.019 (-1.45)	0.14	0.011 (1.95)*	-0.018 (-0.74)	0.04
$\ln(1 + SF_i^{FB} / Y_i)$	0.005 (1.59)	-0.043 (-5.30)***	0.68	0.006 (1.76)	-0.075 (-5.20)***	0.68

FM: Flow Approach

FB: Benefit Approach

i : regions or countries

m: average of the regions or countries

Terms in brackets are *t*-statistics values

*** indicates a parameter significant at the 99% confidence level

** indicates a parameter significant at the 95% confidence level

* indicates a parameter significant at the 90% confidence level

Our analysis of the redistributive effect generated by the European Union budget is carried out by estimating equation (3), and by calculating the final income as that resulting from the global activity of the European Union, that is:

$$YF = Y + SF \quad (6)$$

where,

SF is the fiscal balance generated by the community budget.

Table 8 shows the estimation of the redistributive capacity of the European Union following the two approaches for allocated community expenditure by region and by country and in variables expressed in ecus and PPS.

The results obtained show that the regional redistribution capacity of the European Union via its revenue and expenditure policies is relatively small, and it is always higher when expenditures are allocated territorially following the benefit approach. Specifically, at the regional level the redistributive power reaches 1.87% when expenditures are assigned according to the flow approach and variables are considered in ecus, while it reaches 6.19% when expenditures are allocated following the benefit approach and variables are expressed in PPS.

Nevertheless, at the national level the redistributive impact of the fiscal balance is negative when we assess expenditures according to the flow approach (-1.87% in ecus and -3.46% in PPS). However, when we use the benefit approach the redistributive power is slightly higher than that obtained in the regional sample (3.94% in ecus and 6.98% in PPS).

Table 8

The redistributive power of the fiscal balance generated by the European Union budget

Dependent Var.: Final Income (YF_i/YF_m)	Variables in ECUS				Variables in PPS			
	Constant	Indep.V.: Y_i/Y_m Coefficient β	R^2	$\%(1-\beta)$	Constant	Indep.V.: Y_i/Y_m Coefficient β	R^2	$\%(1-\beta)$
<i>a) Regional sample (n = 118)</i>								
Y + SF _{FM}	0,024 (4,09)***	0,9813 (163,5)***	1,00	1,87	0,041 (4,09)***	0,9660 (93,6)***	0,99	3,40
Y + SF _{FB}	0,041 (9,40)***	0,9614 (220,1)***	1,00	3,86	0,0657 (7,778)***	0,9382 (108,4)***	0,99	6,19
<i>b) National sample (n = 15)</i>								
Y + SF _{FM}	-0,009 (-0,45)	1,0187 (57,6)***	1,00	-1,87	-0,023 (-0,84)	1,0346 (39,2)***	0,99	-3,46
Y + SF _{FB}	0,043 (4,71)***	0,9606 (117,9)***	1,00	3,94	0,075 (5,57)***	0,9302 (72,6)***	1,00	6,98

FM: Flow Approach

FB: Benefit Approach

i : regions or countries

m: average of the regions or countries

Terms in brackets are *t*-statistics values

*** indicates a parameter significant at the 99% confidence level

** indicates a parameter significant at the 95% confidence level

* indicates a parameter significant at the 90% confidence level

5. CONCLUSIONS

In this study, we have analysed the power of the European Union to diminish territorial disparities in per capita income between regions and countries via its budget policy.

Although, the redistributive capacity of community revenue is very low, we show that it is greater between countries than between regions. This is made apparent by the fact that in the regional sample all of own resources (traditional own resources, VAT resources and GNP resources) are regressive and increase regional income disparities, while in the national sample only the traditional own resources are clearly regressive.

This behaviour responds to the logic of the financing system since the limitations established at the national level to reduce regressivity do not extend to the regional level. A clear example of this is the behaviour of the VAT resource. In the regional sample this resource increases territorial disparities, while at the national level it shows a capacity to reduce them. The GNP resource is, thanks to its design and structure, practically neutral, while the traditional own resources are highly regressive in two samples, although their capacity to increase territorial disparities is very low as their specific weight is very small. Consequently, the only source of revenue that has a progressive character is the tax on the wages and salaries of the personnel of the Institutions of the European Union.

The power of the community expenditure to diminish regional income disparities is very low, though greater when the territorial assignation of expenditure is undertaken following the benefit approach. Nevertheless, community expenditure has a much greater redistributive power than that shown by its revenues.

When we adopt the benefit approach, the capacity of community expenditures to redistribute income among regions stands at 3.55% when the variables are defined in ecus and 5.84% when they are expressed in PPS. On the other hand, when we adopt the flow approach for the territorial assignation of expenditure, these percentages are 1.59% and 3.09%, respectively.

The redistributive power decreases when the analysis is carried out at the national level. In this case, the redistributive capacity is 2.55% and 4.51%, when adopting the benefit approach and depending on whether the variables are considered in ecus or in PPS. In contrast, when we assign the expenditure to the country where the expenditure materialises, community expenditure increases the national income disparities to 3.18% when the variables are in ecus and to 5.82% when they are in PPS.

The expenditure with the greatest redistributive capacity is that made on structural actions, with the regional sample showing the highest coefficient of estimated income elasticity. The actual redistribution power is low since the expenditure on structural actions has a relatively low weight in terms of overall regional income. Although agricultural expenditure shows an income elasticity lower than one in both samples and absorbs more than 50% of the European Union budget, its redistributive power is very low. It is, in fact, estimated at around 2%. The expenditure on research and development and on the rest of internal policies are regressive when these expenditures are territorially allocated following the flow approach. Consequently, they increase the national and regional income disparities. However, when these expenditures are territorially assigned according to the benefit approach they have a small redistributive power.

The redistributive power of the fiscal balance generated by the activity of the European Union is lower, especially when the territorial assignation of expenditure is carried out following the flow approach. In this case, the power of the European Union budget to diminish regional disparities is 1.87% and 3.40%, depending on whether the variables are in ecus or in PPS. At the national level, the activity of the European Union increases the disparities to 1.87% when the variables are defined in ecus and to 3.46% when they are expressed in PPS.

The estimates made applying the benefit approach provide evidence that the power to diminish territorial disparities of income through the European Union budget is more intensive: at the regional level the power is 3.86% in ecus and 6.19% in PPS and at the national level it is 3.94% in ecus and 6.98% in PPS. This occurs because of the behaviour of expenditures made in research and development and internal policies since they become progressive when they are assigned following the benefit approach.

In short, our empirical analysis demonstrates that the territorial redistributive power of the EU is quite low (with a mean value standing at around 3.5%) when compared with that of central governments. However, if we consider that the relative size of the European Union budget, in terms of GDP (less than 2%), is quite small with respect to those of federal governments (in the United States the federal budget represents around 20% of the GDP, while in Canada it represents 18%) and the budgets of central governments of unitary countries (in France it stands at around 45%, in the United Kingdom, 34% and in Spain, 34%) then the redistributive power is in fact very high

Thus, the community budget includes certain instruments that are very progressive such as structural actions and agricultural expenditure. Consequently, the redistributive power can be increased in a number of ways, though here we mention just three possibilities: i) increasing the more redistributive categories of expenditure ii) increasing the progressivity of the European Union financing system iii) increasing the size of the European Union budget.

REFERENCES

BARBERÁN, R., BOSCH, N. CASTELLS, A. i ESPASA, M. (2000): “El poder redistributivo del presupuesto del gobierno central”, paper presented at VII Encuentro de Economía Pública, Zaragoza.

BAYOUMI, T. y MASSON, P. (1995): “Fiscal Flows in the United States and Canada: Lessons for Monetary Union in Europe”, European Economic Review, vol. 39, pp. 253-274.

BLAKE, N. (1995): “The Regional Implications of Macroeconomic Policy”, Oxford Review of Economic Policy, vol. 11, vol. 2, pp. 145-164.

CASTELLS, A. (1998a): “Integració monetària i desequilibris territorials a la Unió Europea”, Revista Econòmica de Banca Catalana, vol. 114, pp. 19-45.

CASTELLS, A. (1998b): “Les relacions fiscals de Catalunya amb Espanya: Algunes reflexions en el context europeu” in Omnium Cultural: Relacions Econòmiques i Financeres de Catalunya amb Espanya, Proa, pp. 125-148.

CECCHINI, P. (1988): Europa 1992: Una apuesta de futuro, Alianza Editorial, Madrid.

CREMER, H. y PESTIEAU P. (1996): “Distributive implications of European integration”, European Economic Review, vol. 40, pp. 747-757.

DAVEZIES, L., NICOT, B.H. y PRUD’HOMME, R. (1996): Economic and Social Cohesion in the European Union: The Impact of Member State’s Own Policies. European Commission.

DOMÉNECH, R., MAUDES, A. y VARELA, J. (2000): “Fiscal flows in Europe: the Redistributive Effects of the EU Budget”, Universidad de Valencia, Valencia.

DUBOZ, M.L. y NICOT, B. (1998): “Fédéralisme budgétaire et union monétaire européenne: les enseignements de l’expérience allemande”, Revue d’Economie Politique, n° 108, vol. 1, pp. 37-51.

EMERSON, M., GROS, D., ITALIANER, A., PISANI-FERRY, J., REICHENBACH, H. (1992): One market, one money. An evaluation of the potential benefits and costs of forming an economic and monetary union, Oxford University Press, Oxford.

ESPASA, M. (2000): “El poder redistributivo del Presupuesto de la Unión Europea. Análisis a través de los flujos fiscales regionales”, Doctoral Thesis, Universitat de Barcelona.

GOODHART, C. and SMITH, S. (1993): “Stabilization”, European Economy, n° 5, Reports and Studies, pp. 417-455.

JONES, R. and WHALLEY, J. (1990): “Regional balance sheets of gains and losses from national policies”, Regional Science and Urban Economics, n° 20, pp. 421-435.

KRUGMAN, P. (1993): “Lessons of Massachussets for EMU”, in TORRES, F. and GIAVAZZI, F. (eds.): Adjustment and Growth in the European Monetary Union, Cambridge University Press, pp. 241-261.

MC DOUGALL (1977): Rapport du groupe de réflexion sur le rôle des finances publiques dans l’integration européenne, Commission des Communautés Europeennes, Serie Economie et Finances, n° A13 y B13, Luxembourg.

MC DOUGALL (1992): “Economic and Monetary Union and the European Community Budget”, National Institute Economic Review, May 1992, pp. 64-68.

MÉLITZ J. y ZUMER, F. (1998): “Redistribution régionale et stabilisation par le gouvernement central”, Économie Internationale, n° 75, 3er. trimestre, pp. 3-31.

MUNDELL, R. (1961): “A theory of optimum currency areas”, American Economic Review, n° 51, pp. 657-665.

PADOA-SCHIOPPA, T. (1987): Eficacia, Estabilidad y Equidad: Una estrategia para la evolución del sistema económico de la Comunidad Europea, Alianza Editorial, Madrid.

PEREIRA, A.L. (1999): “International Public Transfers and Convergence in the European Union”, Public Finance Review, vol. 27, n° 2, pp. 194-219.

PISANI-FERRY, J., ITALIANER, A. y LESCURE, R. (1993): “Stabilization properties of budgetary systems: a simulation analysis”, European Economy, n° 5, Reports and Studies, pp. 511-538.

POLA, G. (1998): “The Regional Incidence of a Central Budget. The Italian Case”, Commission DG XIX: Definition of and Empirical Evidence on Intranational (Regional) “Net Balances” in National States.

SALA-I-MARTÍN, X. y SACHS, J. (1992): “Fiscal federalism and optimum currency areas: evidence for Europe from the United States” en CANZONERI, M., GRILLI, V. y MASSON, P. (eds.): Establishing a Central Bank: Issues in Europe and Lessons from the US, Cambridge University Press, Cambridge, pp. 195-219.

VON HAGEN, J. (1992): “Fiscal Arrangements in a Monetary Union: Evidence from the US” in FAIR, D. and DE BOISSIEU, C. (eds.): Fiscal Policy, Taxation and the Financial System in an Increasingly Integrated Europe, Kluwer Academic Publishers, Dordrecht, pp. 337-359.