Equalization effects of local financing models: an application to Portugal

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Abstract

One objective frequently found in models of decentralized financing is that of equalization. The concern is that poorer jurisdictions receive enough resources for basic services and for development promotion, thus eliminating horizontal and vertical imbalances. In Portugal, decentralization has occurred at two levels: the local, for the whole country and the regional for the autonomous regions of the Azores and Madeira. Decentralization to local governments has undergone several changes in recent decades. The current paper focuses on testing for the presence of an equalization effect in the models adopted to finance municipalities in Portugal, since the nineteen nineties. Using the theoretical background that maintains that for the presence of an equalizing effect it is necessary that, on a per capita basis, poorer regions or localities receive relatively more transfers than the richer jurisdictions, a test is made using a data set that includes all municipalities of Portugal. The situation of the two autonomous regions is controlled with dummy variables. The hypothesis that the models used have an equalizing effect is tested through the sign of the coefficient of the regression of per capita transfers on per capita own resources. In the presence of an equalizing effect the sign will be significant and negative. It is confirmed that, for the period under analysis, the municipalities with lower per capita own revenues are those that receive more transfers per capita. There is, therefore, an equalizing effect in the current transfer system to municipalities. Using pooled data, one can also conclude that the equalization effect has become stronger with the 1998 and 2002 reviews of the system, when compared to the system in effect in 1991.

Keywords: equalization, local financing

JEL classification: H72, H73, H77

1 – Introduction

Fiscal, administrative and political decentralization has been a common characteristic of the reforms undertaken in a variety of countries in the last few decades (Mackintosh and Roy, 1999; Roy, 1999; Oats, 1998; Ahmad, 1997; Blow, Hall e Smith, 1996). Decentralization has been advocated by different interest groups, reacting to highly centralized regimes, and by influential international organizations like the World Bank and the International Monetary Fund (Ahmad e Tanzi, 2002). Subjacent to these proposals is the conviction that there are benefits to be obtained from a decentralized organization of government or that decentralization can be more advantageous if well planned.

Decentralization is, however, invariably associated to vertical and horizontal imbalances. These imbalances lead to the immediate need to devise some system of transfers that eliminates them. Transfer systems, though, are not always successful in attaining these objectives.

In Portugal, decentralization has occurred, in recent decades, at two levels: on the one hand, two autonomous regions were crated for the archipelagos of the Azores and Madeira; on the other hand, improvements were introduced in the financing model of local governments. Regionalization of the whole country was planned but was not approved in a referendum.

The purpose of the current paper is to focus on the characteristics of local government financing and, in particular, to test whether or not the system incorporates an equalizing effect. The test is undertaken at three different time periods, coinciding with the implementation of an equal number of reforms. Particular attention is given to the local effects in the autonomous regions of the Azores and of Madeira.

In what follows, the next section reviews the main characteristics of the model of local government financing in Portugal. Section three reviews some of the models used to analyse local government financing and specifies the model that will be tested in this exercise. Section four presents the data used, the results of estimation and the interpretation of these results. The final section includes some concluding remarks.

2. Local government financing in Portugal

The economic development of the industrial societies had enormous consequences on the role of the State. It created new social needs, helped the development of a new social conscience and a more critical public opinion and made more evident the need for a reformed public administration to respond to a new setting and new needs, socially more complex and technologically more sophisticated[1].

In Portugal, there was a tendency favourable to a self-limiting central administration and to the intervention of the private sector and of regional and local levels of government. The general tendency of reforms was to attribute to central authorities the role of planning and coordination, leaving to more decentralized levels of government the technical and bureaucratic functions that were to be retained in the public sector [2].

The main thrust of the reforms, on the one hand, rejected the model of a welfare state, national economic intervention and centralized burocracy, highlighting, on the other hand, the virtues of regional and local authorities[3].

Before 1974, local government revenues came from two sources: own revenues[4] and central administration transfers and subsidies. The main characteristics of these transfers and subsidies were their randomness, discretionary nature and lack of transparency, reinforcing the dependency of local governments relative to central governments.

In the constitutional review of 1976[5] it is determined that local governments should have their own assets and finances and that transfers to local governments should aim to correct asymmetries between jurisdictions. Own revenues should include those that derive from the management of assets and from fees and charges from the provision of services. In this constitutional review local governments are also attributed some fiscal powers. Financial autonomy was thus constitutionally established leaving to regulatory decrees the establishment of the local government financing rules.

Since the 1976 Constitution was published, four alterations were made to the local financing regime.

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[1] Montalvo, António Rebordão,. 1999. "Reflexões Sobre a Descentralização e a Reforma da Administração Periférica do Estado", **Revista de Administração Local, n.º 169**; Jan. Feb.

[2] Sousa Franco, António L. 2001. **Finanças Públicas e Direito Financeiro, Volume I**, 4ª ed., Coimbra, Editora Almedina.

[3] Amaral, Diogo Freitas do. 1988. Curso de Direito Administrativo, Volume I, Coimbra, Editora Almedina.

[4] In the 1940 administrative code own revenues comprised direct and indirect taxes, revenue from own assets, fees, fines and other municipal revenues.

[5] Currentl art. 239º of the constitution (Lei Constitucional n.º 1/97, of September 20, fourth constitutional review.).

The first regime was established in 1979[6]. Financing of local governments changed from ad-oc procedures and negotiation to become dependent on municipal plans and on autonomous decisions of the local authorities.

The subsequent reviews of the law occurred in 1984, 1987 and 1998[7]. These new versions of the law introduced a formula based transfer scheme.

The main problem in decentralized forms of government is still the determination of the responsibilities and resources that are attributed to each level of government in order to avoid vertical and horizontal imbalances.

Vertical imbalances occur when, at a certain level of government, revenues are not balanced with expenditure responsibilities.

Horizontal imbalances occur when, at the same level of government, there are different jurisdictions have different fiscal capacities due to differences in their fiscal potential, differences in expenditure needs and differences in the cost of provision of services.

A common objective of intergovernmental transfers is to guarantee a certain level of territorial equity by assuring that citizens, independently of where they live, will have access to a determinate set of services[8].

Transfers might also be integrated in a strategy to gain more efficiency when it is believed that lower levels of government can better provide some of the services involved.

Among the different types of transfers those that better fit the decentralization purpose are unconditional transfers. The majority of transfers to local governments fit into this category[9].

Currently, the most important revenue sources for local governments are the own revenues and transfers from the national budget as a share of taxes collected by the central authorities.

Own revenue sources come mostly from taxes (property) and fees from municipal services.

Revenues can be represented in the following way:

(1) $R_{Ti} = R_{Pi} + TR_{Mi}$

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[6] First local finance law – Lei n.º 1/79, of January 2.

[7] Decreto- Lei n.º 98/84, of March 29 ; Lei n.º 1/87, of January 6 and; Local finance law – Lei n.º 42/98, of August 6.

[8] Pereira, Paulo Trigo, e Silva, J. Andrade. 1998. "Um Novo Modelo de Perequação Financeira Municipal – Fundo de Equilíbrio Financeiro". V APDR Congress, Coimbra, June.

[9] Transfer theory is developed in Oates, Wallace E. 1972. **Fiscal Federalism**, New York: Hercourt Brace Jovanovitch, and in Wilde, James. 1971. Grants-in-Aid: The Analytics of Design and Response, National Tax Journal.

where

R_{Ti} represents total revenue of municipality i,

R_{Pi} represents own revenues of municipality i and

TR_{Mi} represents transfers from the national budget to municipality i.

Own revenues can be represented by the following expression:

(2) $R_{Pi} = \sum_{j=1}^{i} t_j^i B_j^i + \sum_{m=1}^{M_i} pm^i * qm^i$

where

j represents the index of the municipal taxes,

B_j^i represents the tax base of local taxes j (j=1,2....j),

t_j^i represents the rate applied by municipality i to the base j,

M^i represents the number of services sold by municipality I,

qm^i represents the volume of services sold;

pm^i represents the unit cost of each service.

The budgets of local governments are, thus financed by own revenues, credit and transfers. The transfers themselves are attributed trough three different funds: FBM (Municipal Base Fund), FGM (General Municipal Fund) and FCM (Municipal Cohesion Fund).

The Municipal Base Fund is meant to provide municipalities with basic financing for its operations and is equally distributed among all of them.

The General Municipal Fund seeks to provide municipalities with the necessary financing associated to operations and investment. It is initially dived among three regions: mainland Portugal; the Autonomous Region of the Azores and; the Autonomous Region of Madeira. The distribution factors are population, the number of municipalities on each group and the land area covered.

The Municipal Cohesion Fund is meant to correct asymmetries in favour of the less developed areas. It is distributed on the basis of an index of fiscal need and of an index of disparity of opportunities. Fiscal need is assessed on the basis of the difference between average national potential per capita revenue and standard potential per capita revenue for each municipality, with respect to property taxes, motor vehicle taxes and

property sales taxes. The index of disparity of opportunities takes into account access to health services, comfort factors, basic sanitation and acquisition of knowledge.

Analysis of the factors that determine the distribution of the funds budgeted for local government support would suggest a strong equalizing effect given that, in various instances, the distribution is made on the basis of average values. This approach will strongly benefit those municipalities that are less capable of generating their own resources. In addition, the transfers from the Municipal Cohesion Fund are based on an index of fiscal need that should benefit the municipalities that are less capable of generating the necessary funds for development.

Given its configuration, this system is a partial equalization approach since it focuses, almost exclusively, on revenue sharing without taking into direct account cost factors. Land area, population and the fiscal need index might achieve that purpose but only indirectly.

A full equalization approach to determine transfer schemes is suggested by Ahmad and Thomas (1997). The authors present a formula that starts by looking at standard revenue and standard expenditures. Standardized revenue is determined in accordance with the potential tax base and the national tax rates. Standardized expenditures are determined in accor4dance with national per capita standards with or without correction factors.

Transfers that, simultaneously, eliminate horizontal and vertical imbalances are given by the difference between standardized revenue and standardized expenditures.

3 – Testing for Equalization Effects

It is possible to identify almost as many variants of transfer formulas as there are countries that adopt decentralized regional or local government financing models. It is possible, using fairly simple models, to test the equalization impact of each system.

In an application to China, the World Bank (2000) regresses per capita GDP on per capita transfers[10]. The regression used transfers per capita for each of the 31 provinces as the dependent variable and per capita GDP as the independent variable. The model was the following:

[10] World Bank, 2000, ***China: Managing Public Expenditures for Better Results***. Abril.

$$Tpc_i = a_o + a_1 GDPpc_i + \varepsilon_i ,$$

where Tpc_i is transfers per capita for province i,

$GDPpc_i$ is gross domestic product per capita for province i and

ε_i is the error term.

The presence of a significant equalizing effect requires that coefficient a_1 be negative and significant. This means that the lower the GDP per capita the greater, other things being equal, the transfers should be.

Using 1994 data, the application of this model provided the following results:

$$Tpc_i = 206{,}46 - 0{,}97 GDPpc_i$$
$$(1{,}93) \quad (-0{,}075)$$

Values in parenthesis are t statistics and R^2=0,0002.

From these results it is concluded that there is no relationship between the transfers to each province and its respective need, measured by per capita GDP. A test using 2000 data leads to the same conclusion.

Assuming that promoting fiscal equalization is an objective, Hayo e Wrede (2001)[11] formulate an axiomatic approach from which one can develop tests of a particular transfer system.

The authors assume that the evaluation can be made with the net contribution as the dependent variable and an indicator of need and GDP as explanatory variables.

In their model, Hayo e Wrede (2001)[12], assume that the elimination of fiscal disequilibria occur in n jurisdictions, where $n \geq 3$. Each jurisdiction has gross revenues Y_i, expenditures E_i and population Z_i, where Y,E and $Z \geq 0$. Net revenue, F_i, of each jurisdiction depends on gross revenue, expenditure and the population of the n jurisdictions.

The model was used to test the redistribution impact of EU policies.

Using per capita data on the net contribution of each country to the EU budget, each country's GDP (GDP_{it}), aggregate GDP (GDP_t) and the weight of agriculture as a proxy for need (AGR_{it} and AGR_t), the authors verify if the redistribution policy of the

[12] This paper is, itself, inspired in the work of Buhl and Pfingsten (1990) and Aczel and Pfingsten (1993) who also start from an axiomatic approach to the problem.

Union is in accordance with the model. The isolating monotonic equalization is assumed to derive an explicit functional form for the test.

The net income function can be written as follows:

$$F_i = Y_i - E_i - T_i ,$$

where $T_i = (1-c)Y_i - (1-d)E_i + fz_i$ e $f = (1-d)E - (1-c)Y$,

F_i is net revenue,

Y_i is gross revenue,

E_i is expenditure,

z_i is population and

T_i is the net contribution o jurisdiction i to the equalization fund.

Dividing T_i by the population we get the per capita values

$$t_i = (1-c)y_i - (1-d)e_i + g,$$

where $g = (1-d)e - (1-c)y$, with the lower case variables representing per capita values. In other words, net EU contributions depend on gross national product, on the aggregate product of the EU, on the expenditures of each country and on the expenditures of the EU.

The model effectively estimated was the following:

$$CL_{it} = \beta_1 GDP_{it} + \beta_2 GDP_t + \beta_3 AGR_{it} + \beta_4 AGR_t + \varepsilon_{it,}$$

where, CL is net contribution, $E(\varepsilon_{it}) = 0$, Var $\varepsilon_{it} = \sigma^2$, i is the country index and t is the time index.

In another version of the model, after confirming that $\beta_1 = -\beta_2$ and $\beta_3 = -\beta_4$, a new specification was estimated:

$$CL_{it} = \beta_1 (GDP_{it} - GDP_t) + \beta_3 (AGR_{it} - AGR_t) + \varepsilon_{it,}$$

where $\varepsilon_{it} = u_i + v_{it}$, u_i being non observable and v_{it} being the residual.

With this application the authors conclude that, for the various specifications, the coefficients have the expected signs and are significant. The bigger the weight of agriculture relative to the EU average the lower the contribution of the country to the

EU and, the smaller the difference of GDP to the EU average the greater the contribution to the EU budget.

In the current paper, a similar approach is used which considers per capita transfers to municipalities as the dependent variable. The explanatory variables are per capita revenues, for all situations tested, and per capita GDP for each municipality in some versions of the model.

Per capita transfers are considered, in this case, to be a proxy of net contributions whereas per capita own revenue is an indicator of need, as might be per capita GDP. The model tested was

$$\mathbf{TRS_{it} = \alpha_0 + \alpha_1 OR_{it} + \alpha_2 GDP_{it}}$$

Where TRS represents transfers to each municipality,

OR represents own revenues and

GDP is an indicator of GDP for each municipality.

An alternative version of the model tested used logarithms of each of the key variables.

$$\mathbf{lnTRS_{it} = \alpha_0 + \alpha_1 lnOR_{it} + \alpha_2 lnGDP_{it}}$$

4 – Data and Results

To test the model proposed in the previous section, data was collected on own revenue and transfers for each municipality for 1991, 1998 and 2002. The choice of dates for the collection of data was determined by the moment of introduction of changes in the transfer system.

Observations were registered for 304 municipalities. Minor adjustments were made for situations associated to the creation of new municipalities. One municipality in the Azores was eliminated due to its atypical characteristics: it has a population of only 400 people, leading to an unusual level of per capita transfers. Elimination of this municipality improved the fit of the regressions but did not change the main results.

In addition to the own revenue and transfers for each of the three years referred, a proxy of GDP was obtained for 1998. The proxy was calculated multiplying an index of municipal purchasing power by the per capita GDP for the country.

Two major sets of regressions were run: one using the pooled data and the other using annual data. For each set various dummies were tested, as was a log version of the model.

The dummies used when testing the model with pooled data controlled for the year and tested for differences in the two autonomous regions of the Azores and of Madeira.

The dummies for the yearly data tested for regional differences.

Table 1 presents the results obtained.

The explanatory power of the model is low in all versions tested, even though the regressions are significant.

From all regressions one concludes, looking at the coefficient for the DAcores dummy, that base transfers to the Azores are significantly higher than transfers for the rest of the country or Madeira. There is no significant difference from the national average in the case of Madeira.

Using the pooled data, one concludes that there is a significant negative relationship between transfers and own per capita revenues. This relationship is significantly stronger when we consider the case of the Azores. The same does not happen when controlling for Madeira.

Controlling for the several time periods one also concludes that this negative relationship is stronger after the 1998 and 2002 revisions of the system.

Looking at each year individually, one finds that, in 1991, the relationship between transfers and own revenues was negative but not significant whereas in 1998 and 2002 it was negative and significant, suggesting that the system became more equalizing. The equalizing effect was significantly stronger for the Azores in 1991.

These results are consistent with those obtained with the pooled data when controlling for each time period.

TABLE 1 - Regression Results

Models						
ANOS	Pooled	1991	1998	2002	1998	
	1	2	3	4	5	6
Constant	**29,072**	**25,387**	**47,253**	**56,36**	**67,579**	**62,106**
	18,2	*15,4*	*19,2*	*19,6*	*22,5*	*21,9*
RECpc	**-0,312**	-0,88	**-0,522**	**-0,561**	**0,322**	
	-5,4	*-1,1*	*-5,4*	*-5,9*	*2,6*	
D2000	**22,934**					
	13,0					
D1998	**14,769**					
	8,5					
DMadeira	-0,0556	-1,228	-4,815	2,418	-10,996	-19,02
	-0,1	*-0,2*	*-0,4*	*0,2*	*-1,1*	*-1,3*
DAçores	**32,023**	**61,668**	23,347	36,713	29,646	9,174
	3,9	*4,7*	*1,3*	*1,7*	*1,9*	*0,5*
RECD2000	**-0,0000014**					
	-4,2					
RECD1998	**-0,000001**					
	-3,0					
PIB98					**-0,276**	**-0,223**
					-9,7	*-10,9*
RecAçores	**-3,001**	**-8,82**	-2,154	-3,436	-2,4	0,0
	-3,1	*-3,7*	*-1,1*	*-1,5*	*-1,4*	*-0,2*
RecMad	-0,291	-0,018	-0,114	-0,458	*0,6*	*0,1*
	-0,71	*0,0*	*-0,1*	*-0,6*	*0,9*	*1,0*
R2	0,204	0,09	0,093	0,115	0,307	0,29
F	27,38	7,012	7,182	8,893	23,408	25,76
sign. F	0	0	0	0	0	0

Note: Highlighted values are significant at the 5% level

Introducing GDP as an explanatory variable, only for data relative to 1998, changed the results significantly. The relationship between transfers and GDP is

negative and significant but the relationship between transfers and own revenues become positive and significant, when we used both variables. This means that we are in the presence of multicolinearity, which is consistent with a correlation coefficient of .725 between the two variables.

Eliminating the own revenue variable from this regression yields a model with an equivalent explanatory power with GDP exhibiting a negative and significant sign. Controlling for each of the autonomous regions does not produce significant coefficients.

5 - Conclusion

Transfers from the central government to municipalities exhibit a significant equalizing effect in Portugal, in the period between 1991 and 2000.

The transfer system redistributes 35% of the centralized revenues from the main taxes (corporate, personal and sales) and is comprised of a fixed amount that is equal for all municipalities (FMB – Municipal Base Fund), a component that depends on population and on the land area of the municipality (FGM – General Municipal Fund) and, finally, a component that is based on an estimate of need associated to revenue capacity and to the quality of services in the area (FCM -Municipal Cohesion Fund).

Since a substantial portion of the funds transferred are calculated on a per capita basis, a strong equalizing effect is to be expected. The cohesion component of the transfers should also reinforce the equalizing effect of the system.

The tests undertaken using data for 1991,1998 and 2000 confirmed the presence of the equalizing effect. They also confirm that this effect has been strengthened with the successive revisions of the law.

Controlling for the two autonomous regions of Portugal one concludes that the equalizing effect is significantly stronger in the Azores but exhibits no difference in the case of Madeira.

Using a proxi for per capita GDP instead of per capita own revenues produces equivalent results.

This paper was limited to the use of observations for three years. One possible extension is to use more years on the pooled version of the model. Estimates of GDP

were only possible for on year (1998). It would be interesting to extend the exercise with more years. For this purpose more estimates of GDP are need.

References

Aczel, Janos e Andreas Pfingsten (1993), *Constituent-Sensitive Public Fund Sharing*. Em Mathematical Modeling in Economics – Essays in Honor of Wolfgang Eichhorn, W. Erwin Diewert, Klaus Spremann e Frank Stehling (Eds.). Springer- Verlag. Berlin.

Ahmad, Ehtisham e Vito Tanzi (2002), *Managing Fiscal Decentralization*. Routledge. Londres

Ahmad, Ehtisham, Keping Li e Thomas Richardson (2002). "Recentralization in China?". Em *Managing Fiscal Decentralization***,** Ehtisham Ahmad e Vito Tanzi (Eds.). Routledge. Londres. pags.205-224.

Ahmad, E. e T. Ravi (1997), Financing decentralized expenditures: an international comparison of grants, Vermont: Edward Elgar Publishing Limited.

Ahmad e Craig (1995), "Transferencias intergubernamentales en una sistema federal", Hacienda Publica Espanhola, 132-2, pags. 187-212.

Amaral, Diogo Freitas do (1988) *Curso de Direito Administrativo*, Volume I, Coimbra, Editora Almedina.

Amaral, Diogo Freitas do (1985), Sousa Franco, António L. 2001. *Finanças Públicas e Direito Financeiro*, Volume II, 4ª ed., Coimbra, Editora Almedina *Uma Solução Para Portugal*, 7ª ed., Publicações Europa-América.

Banco Mundial (2002), *CHINA: National Development and Sub-Ntional Finance – A Review of Provincial Expenditures*, Abril.

Banco Mundial (2000), *CHINA: Managing Public Expenditures for Better Results – Country Economic Memorandum*, Abril.

Barbosa, A. S. P. (1997) *Economia Pública*, Lisboa: McGrawHill.

Berkowitz, Daniel and Wei Li (1997), *Decentralization in Transition Economies: A Tragedy of the Commons?* The William Davidson Institute at the University of Michigan Business School, Working Paper No 45, Maio.

Braun, Joachim e Ulrike Grote (2002), "Does Decentralization Serve the Poor?". Em *Managing Fiscal Decentralization***,** Ehtisham Ahmad e Vito Tanzi (Eds.). Routledge. Londres. pags.205-224.

Buhl, Ukrich e Andreas Pfingsten (1990), *On the Distribution of Public Funds*. European Journal of Political Economy 6, 363-376.

Caetano, Marcello (1943), *Tratado Elementar de Direito Administrativo*, Coimbra, Coimbra Editora.

Cohn, Elchanan, e Costa, José da Silva (1984), *Financing Local Governments in Portugal*, U Direcção Geral das Autarquias Locais niversity of South Carolina, College of Business Administration, Division of Research.

Comissão de Apoio à Reestruturação do Equipamento e da Administração do Território Ministério do Equipamento, do Planeamento e da Administração do Território, Descentralização, Regionalização e Reforma Democrática do Estado, 2ª ed., Lisboa, 1998.

Direcção Geral das Autarquias Locais. Finanças Municipais (issues 1988/2000)

Fortuna, M. J. A. (1999), "A Lei de Finanças das Regiões Autónomas, a Descentralização e a Convergência Real", DEG/UA. (mimeo)

Fortuna, Mário (1999), *A lei de finanças das regiões autónomas, a descentralização e a convergência real*, In Regiões e Cidades na União Europeia: Que Futuro?. Colecção APDR (Associação Portuguesa de Desenvolvimento Regional), Coimbra.

Fortuna, Mário (2000), *Aspectos Económicos de uma Lei de Finanças Regionais*. Seminário do Departamento n.º 19/2000, Departamento de Economia, ISEG, Lisboa.

Gurgur, Tugrul e Anwar Shah (2002), "Localization and Corruption – panacea or Pandora´s box?". Em *Managing Fiscal Decentralization***,** Ehtisham Ahmad e Vito Tanzi (Eds.). Routledge. Londres. Págs46-67.

Hayo, Bernd e Matthias Wrede (2001), *Fiscal Equalization: Principles and Application to the European Union*. Trabalho apresentado na CESifo Area Conference on Public Sector Economics. Munique.

Litvack, Jennie e Jessica Seddon (1999), *Decentralization*: Briefing notes. World Bank Institute, WBI Working Papers. Banco Mundial.

Montalvo, António Rebordão (1999), *Reflexões sobre a Descentralização e a Reforma da Administração Periférica do Estado*, Revista de Administração Local, n.º 169; Jan. Fev.

Oats, Wallace E. (1998), *The Economics of Fiscal Federalism and Local Finance*. The International Library of Critical Writings in Economics. North Hampton, MA. USA.

Pereira, Paulo Trigo (1998), *Regionalização, Finanças Locais e Desenvolvimento*. Ministério do Equipamento, do Planeamento e da Administração do Território. Lisboa.

Pereira, Paulo Trigo, e Silva, J. Andrade (1998), *Um Novo Modelo de Perequação Financeira Municipal* – Fundo de Equilíbrio Financeiro, comunicação apresentada no V Congresso da APDR (Associação Portuguesa de Desenvolvimento Regional), Coimbra, Junho.

Philip, Loïc (1983), Finances *Publiques – problémes generaux et droit budgetaire e financier*, 2ª ed..

Rosen, H. S. (1995), *Public Finance*, 5ª Ed., Chicago: Richard Irwin, Inc.

Sousa Franco, António L. (2001) *Finanças Públicas e Direito Financeiro*, Volume II, 4ª ed., Coimbra, Editora Almedina

Stiglitz, J. (1988), *Economics of the Public Sector*, 2ª Ed., New York: W.W. Norton & Company.

Tieben, Ulrich (2001), *Fiscal Decentralization & Economic Growth in High-Income OECD Countries*. European Network of Economic Policy Research Institutes, Working Paper No. 1/January 2001.

Vinuela, Julio (1999), *Fiscal Decentralisation in Spain*, IMF. Mimeo.

Zhang, Tao e Heng-fu Zou (1998), "Fiscal Decentralization, Public Spending and Economic Growth in China," Journal of Public Economics, Vol.67, pp. 221-240.

ANNEXES

TABLE A1 - Regression Results

	MODELS														
ANOS	POOLED						1991			1998			2002		
dep var	TRpc						TRpc			TRpc			TRpc		
	1	2	3	4	5	6	7	8	9	110	11	12	13	14	15
Constant	**41,163**	**32,377**	**31,721**	**30,587**	**29,754**	**29,072**	**27,526**	**25,551**	**25,387**	**47,549**	**47,402**	**47,253**	**56,974**	**56,72**	**56,36**
	30,8	*21,9*	*20,5*	*20,3*	*18,8*	*18,2*	*17,6*	*15,3*	*15,4*	*21,1*	*19,4*	*19,2*	*21,6*	*19,8*	*19,6*
RECpc	-0,315	**-0,46**	**-0,438**	-0,351	-0,322	-0,312	**-0,165**	**-0,098**	**-0,88**	**-0,534**	**-0,529**	**-0,522**	**-0,583**	**-0,575**	**-0,561**
	-5,8	*-9,0*	*-8,3*	*-6,3*	*-5,6*	*-5,4*	*-2,1*	*-1,2*	*-1,1*	*-5,8*	*-5,5*	*-5,4*	*-6,4*	*-6,1*	*-5,9*
D2000		**21,606**	**21,428**	**22,329**	**22,131**	**22,934**									
		12,3	*12,2*	*12,7*	*12,6*	*13,0*									
D1998		**13,654**	**13,561**	**14,195**	**14,101**	**14,769**									
		7,9	*7,872*	*8,2*	*8,159*	*8,5*									
DMadeira			-4,626		-3,966	-0,0556		-1,449	-1,228		-6,204	-4,815		-4,907	2,418
			-1,2		*-1,1*	*-0,1*		*-0,3*	*-0,2*		*-0,9*	*-0,4*		*-0,6*	*0,2*
DAçores			**7,657**		**8,411**	**32,023**		**15,5**	**61,668**		4,279	23,347		3,991	36,713
			2,5		*2,8*	*3,9*		*3,9*	*4,7*		*0,8*	*1,3*		*0,6*	*1,7*
RECD2000				**-0,000001**	**-0,000001**	**-0,0000014**									
				-4,0	*-4,1*	*-4,2*									
RECD1998				**-0,000001**	**-0,000001**	**-0,000001**									
				-2,8	*-2,9*	*-3,0*									
PIB98															
RecAçores						-3,001			**-8,82**			-2,154			-3,436
						-3,1			***-3,7***			*-1,1*			*-1,5*
RecMad						-0,291			-0,018			-0,114			-0,458
						-0,71			*0,0*			*-0,1*			*-0,6*
R2	0,035	0,173	0,179	0,191	0,197	0,204	0,012	0,055	0,09	0,096	0,095	0,093	0,116	0,113	0,115
F	34,201	64,669	40,745	44,016	33,047	27,,38	4,616	6,858	7,012	33,141	11,601	7,182	40,921	13,88	8,893
sign. F	0	0	0	0	0	0	0,03	0	0	0	0	0	0	0	0