Is There Any Race to the Top of Productive Government Expenditures? Evidence from OECD Countries (1970-1997)

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Abstract

This paper evaluates whether there has been any convergence in government expenditures. The results obtained, by means of the Tukey box-plot, σ-convergence and conditional β-convergence, reveal that there is a growing fiscal interdependence among OECD countries. I argue that there is strong evidence of a "race to the top" of government productive expenditures among OECD countries during the period 1970-1997. The econometric analysis shows that aggregate OECD productive expenditures have pressured countries to increase their own levels of productive expenditures, which might be indicating a competition to attract FDI. In contrast, there is no evidence of convergence in non-productive government expenditures.

Keywords: *Composition of government expenditure, convergence, economic integration, OECD.*

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1. Introduction

Slemrod (2004) recently analyzed the convergence of corporate tax rates and concluded that some of this convergence is due to international pressures for tax competition. International economic integration might also lead to a convergence process in government expenditures. Keen and Marchand (1997) elaborate a model in which, in the presence of mobile capital, increasing competence will encourage governments to over-provide productive expenditures at the expense of utility-enhancing spending. In fact, the efficiency hypothesis contends that efficiency and competence for attracting Foreign Direct Investment (FDI) will lead countries to reduce taxation, particularly capital taxes, but also to restructure the composition of government expenditure away from social welfare expenditure and towards privately productive public inputs (Tanzi, 2000). Governments may become competitors to attract mobile factors devoting more resources towards privately productive public inputs such as education, training, research and development and infrastructures. Furthermore, maintaining generous social protection systems represents a severe liability for the export sector and the domestic sector exposed to import competition in the advent of a more competitive global environment.

According to the efficiency hypothesis, we should expect a convergence towards the highest levels of productive expenditures and the lowest levels of social welfare spending. However, Rodrik (1998) claims that more open to trade economies are more subject to external shocks and, therefore, citizens demand their governments to provide more social insurance to mitigate this exposure to external risk. Furthermore, Scheve and Slaughter (2006) contend that political support for globalization is associated with the protection of the social welfare system. Therefore, is it not clear whether governments would be able to engage in a race towards the top levels of productive expenditures and towards the bottom levels of non-productive expenditures. In this respect, we aggregate the Classification of Functions of the Government (COFOG, United Nations 2000) as productive and non-productive into theory-based categories following Barro and Sala-i-Martin (1995), Devarajan et al. (1996) and the empirical evidence provided

by Kneller et al. (1999). Government expenditures entering as an input in the private production function and having a direct effect upon economic growth are classified as productive expenditures. Productive expenditures generally include spending with substantial physical or human capital component. Government expenditures not entering in the private production function and, therefore, not affecting the steady-state rate of growth are considered non-productive expenditures. Non-productive expenditures include spending which, nevertheless, might be utility-enhancing as social welfare expenditures.

Sanz and Velázquez (2004), find that there has been a convergence process in the government expenditure composition by functions. This paper further analyses whether this convergence is due to the efficiency pressure of international economic integration, focusing on the role of FDI inflows and other countries expenditures in this convergence process. Section 2 reviews the predictions of the efficiency hypothesis on the composition of government spending. Section 3 evaluates whether there has been a convergence process in government expenditures across OECD countries using the Tukey box-plots and σ-convergence. Section 4 adapts the conditional β-convergence analysis of the income convergence literature to examine the role of FDI and interdependence in fiscal policies in the government expenditures convergence. Section 5 sets out the main conclusions.

2. International economic integration and convergence of government expenditure.

International trade and financial liberalization has led to a growing interdependence of fiscal policies. Particularly, capital mobility seems to have important implications for the size and composition of government spending. In fact, Bernauer and Achini (2000) contend that capital mobility rather than trade is the distinguishing feature of the current phase of international economic integration. Capital market mobility and international mobility of income tax-payers undercut the fiscal autonomy of nation states (Tanzi, 2000). Capital taxes are an important determinant of firms' location decisions (Devereux and Griffith, 1998) and therefore globalization makes

capital taxation more difficult. In fact, Figlio and Blonigen (2000) argue that countries are more willing to forgo tax revenues to attract FDI than to encourage domestic investments. The reduction in government revenues does not necessarily lead to a reduction in the level of government spending. However, during the late nineties OECD countries have increasingly implemented government spending reforms towards more controlled government spending and active deficit management (Tanzi and Schuknecht, 2000). Ardagna (2001) contend that fiscal consolidations that concentrate on the expenditure side are more effective at achieving household's welfare increases and long-lasting reduction of public liabilities than tax-based adjustments. Indeed, Zaghini (2001) shows that policymakers have recently shifted their priorities from a past policy of deficit financing to one of expenditure reduction policy.

Keen and Marchand (1997) contend that fiscal competition has also important implications for the composition of government spending. These authors elaborate a model in which capital is perfectly mobile across countries but consumers are completely immobile. Each country has an incentive to increase public productive expenditures to offer an attractive environment for mobile capital. Oates (1995) claims those productive public expenditures are relevant for establishing a favourable business climate to influence business location. Furthermore, Figlio and Blonigen (2000) report that foreign firms have requested extensive fund for transport and communications infrastructure, training and education programs as part of location incentive packages in the US. By increasing unilaterally productive expenditures, Keen and Marchand (1997) show that the country also raises the marginal productivity of private capital inducing a capital inflow and increasing the capital tax base.[1] An increase in productive expenditures in a country imposes negative external effects on the others in form of a capital outflow which reduces their tax base, rents and wages. The main conclusion is then that in a non-cooperative equilibrium, not only the level of aggregate government spending will be inefficient but

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[1] Nevertheless, if increasing public productive expenditures leads to a significant reduction of the labour supply, and the subsequent negative effect on the marginal product of capital, it might lead to a capital outflow (Keen and Marchand, 1997).

also the composition. Particularly, governments will over-provide productive expenditures and under-provide utility-enhancing spending (Keen and Marchand, 1997).

In fact, international economic integration threats the social welfare protection systems of OECD countries. Most of social welfare spending, including pension payments and unemployment subsidies, has a direct impact on the cost of labour. Therefore, maintaining generous social protection systems represents a severe liability for the export sector and the domestic sector exposed to import competition in the advent of a more competitive global environment. Moreover, lowering the levels of social protection appears a more useful toll for attracting foreign investment in the EU than tax competition. In fact, the EU has taken some measures to avoid harmful effects of competition among Member States on social protection systems. Along these lines, the Recommendations approved by the European Council (94/441/EEC and 92/442/EEC) proposed a convergence in the aims and policies related to social protection to prevent objectives as the Single Market and the free movement of labour being harmed. In contrast, tax competition is obfuscated by difference between tax systems and bases. Each Member State has its own set of rules (which are subject to frequent changes), in particular laws and conventions on financial accounting and rules for determining taxable profit. Countries have also different arrangements for collection and administration of tax and its own network of tax treaties. The fact that UE Member States have different company tax systems and tax administrations makes of the tax competition in the EU an imperfect type of competition.

Along the lines of the efficiency hypothesis, Cusack (1997) finds that international financial integration decrease the size of government expenditures net of defence spending as a share of GDP in a panel of 16 OECD countries in the period 1955-1989. Kaufman and Segura-Ubiergo (2001) find a negative effect of trade openness on social security expenditure and a positive relationship between capital liberalization and education and health spending in a sample of 14 Latin American countries for the period 1973-1997. Garret and Mitchell (2001) find that trade openness reduces the size of the public sector, government consumption and income transfers in a sample of 18 OECD countries over the period 1961-1983, whereas

financial openness and the inflows and outflows of FDI reduce the size of public sector and consumption. Alesina and Wacziarg (1998) find a positive relationship between trade openness and the size of public consumption in a cross-section of more than 130 developed and developing countries over the period 1985-1989. Nevertheless, this effect disappears when the size of the countries is also taken into account and they conclude that the fact that smaller countries have a larger share of public consumption in GDP and are also more open to trade accounts for the observed positive empirical relationship between trade openness and government size. These authors also find evidence of trade openness increasing the share of government expenditures devoted to defence, education and public investment for a cross-section of more than 100 countries over the period 1980-1984.

According to the efficiency hypothesis, we should expect a convergence towards the highest levels of productive expenditures and the lowest levels of social welfare spending. However, international economic integration might also increase the demand of individuals for social welfare spending preventing governments to follow the predictions of the efficiency hypothesis. Indeed, Rodrik (1998) claims that more open to trade economies are more subject to external shocks and, therefore, citizens demand their governments to provide more social insurance to mitigate the exposure to external risk. Garret (1998) expands the argument also to capital mobility arguing that globalization increases social dislocations and economic insecurity and therefore individuals ask governments to shield them from market dislocations. Furthermore, Scheve and Slaughter (2006) contend that political support for globalization is associated with the protection of the social welfare system. Therefore maintaining social welfare must be compatible with globalization. In fact, these authors find some evidence that more generous labour market policies increase support for free trade using data the 1995 International Social Survey Performance (ISSP) which includes 16 advanced countries. Iversen and Cusack (2000) contend that individuals intensify demands for higher welfare state expenditures for insurance against the exposure to risk. However, these authors claim that the employment losses in the traditional sectors generated by the desindustrialization, and not globalization, are the driving force generating this perception of risk.

Along these lines, Hicks and Swank (1992) find a positive and significant influence of trade openness on social welfare effort for a sample of 18 OECD countries over the period 1960-1982. Quinn (1997) finds that capital account liberalization increases both the size of the public sector and social welfare expenditures as a share of GDP for a cross-section of 30 and 38 developed and developing countries over the period 1974-1989. Rodrik (1998) shows that trade openness increases social welfare spending and aggregate government expenditure for a cross section of countries over the period 1990-1992. In particular, the interaction between trade openness and the terms-of-trade seems to be the channel to capture the induced risk of an open economy and the subsequent increase in the demand for social welfare. Swank (2001) finds a positive effect of trade openness on the size of public sector in a sample of 16 OECD countries over the period 1964-1993. This author also finds that capital mobility increases the size of public sector, social transfers and public consumption characterized by high corporatism, high consensus democracy and low dispersion of authority. Bernauer and Achini (2000) find that trade openness increase the size of the public sector whereas they do not find any significant effect of capital mobility for a varying sample of OECD and non-OECD countries using 5 years average from 1960-1994. Finally, Bretschger and Hettich (2002) find that trade openness and the lack of capital market restrictions increases social expenditures for a panel of 14 OECD countries for the period 1980-1995.

3. Evolution and distribution of government size and composition in the OECD

This section analyzes the distribution of productive, non-productive and aggregate government expenditures across OECD countries. We use the classification of the functions of the government expenditure into productive and non-productive provided by Kneller et al. (1999). These authors grouped the functions of the COFOG into productive and non-productive expenditures following the theoretical models of Barro (1990) and Deverajan et al. (1996). In particular, Kneller et al. (1999) include the functions of general administrative services, defence, public order, health, education, housing and

transport and communications in the aggregate of productive expenditures whereas they classify social security, economic services other than transportation and communications and recreational, cultural and religious affairs as non-productive expenditures. These authors find that productive expenditures so defined increased economic growth whereas non-productive expenditures did not significantly affect economic growth for a sample of 22 OECD countries over the period 1970-1995. Data for government expenditures and COFOG classification builds upon OECD publication National Accounts. Volume II: Detailed Tables. This source is chosen because as it offers information on the consolidated spending of all levels of government and, in addition, it follows the accrual criterion. [2] Our sample includes 26 countries: all OECD members States, except the Czech Republic, Hungary, Poland and the Slovak Republic.

The analysis of the distribution of government expenditure will be carried out by means of the box-plot designed by Tukey (1977). Tukey's box-plot analysis is a very useful tool for illustrating the dynamic distribution of the size and composition of government spending among OECD countries. It easily shows the magnitude and sources of the dispersion. Thus, in the horizontal axis of the Tukey box-plots, we have considered the averages for three sub-periods: the 70's, 80's and 1990-1997. We choose these three intervals based on the evolution and scope of the public sector size during the period 1970-1997 in the OECD countries (Tanzi and Schuknecht, 2000). In the seventies, the public sector expanded rapidly continuing the tendency started after World War II. This trend was interrupted in the early years of the eighties when public expenditure as a share of GDP became stable as a consequence of the threat to the sustainability of public finances at the levels attained in the previous sub-period (Oxley et al., 1990). At the beginning of the nineties public expenditure increased its importance again until 1995, the peak for the whole period, coinciding with the end of the economic crisis. Thereafter, there is a reduction in the public ex-

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[2] Data from Eurostat: *General Government Accounts and Statistics* and the IMF publication: *Government Finance Statistics*, is used on a supplementary basis so as to obtain longer statistical series. Although IMF data covers a longer period of time, it is not consolidated for all levels of public administrations as a rule and uses the cash criterion (see Easterly and Rebelo, 1993 for a discussion on the limitations of the data of this publication).
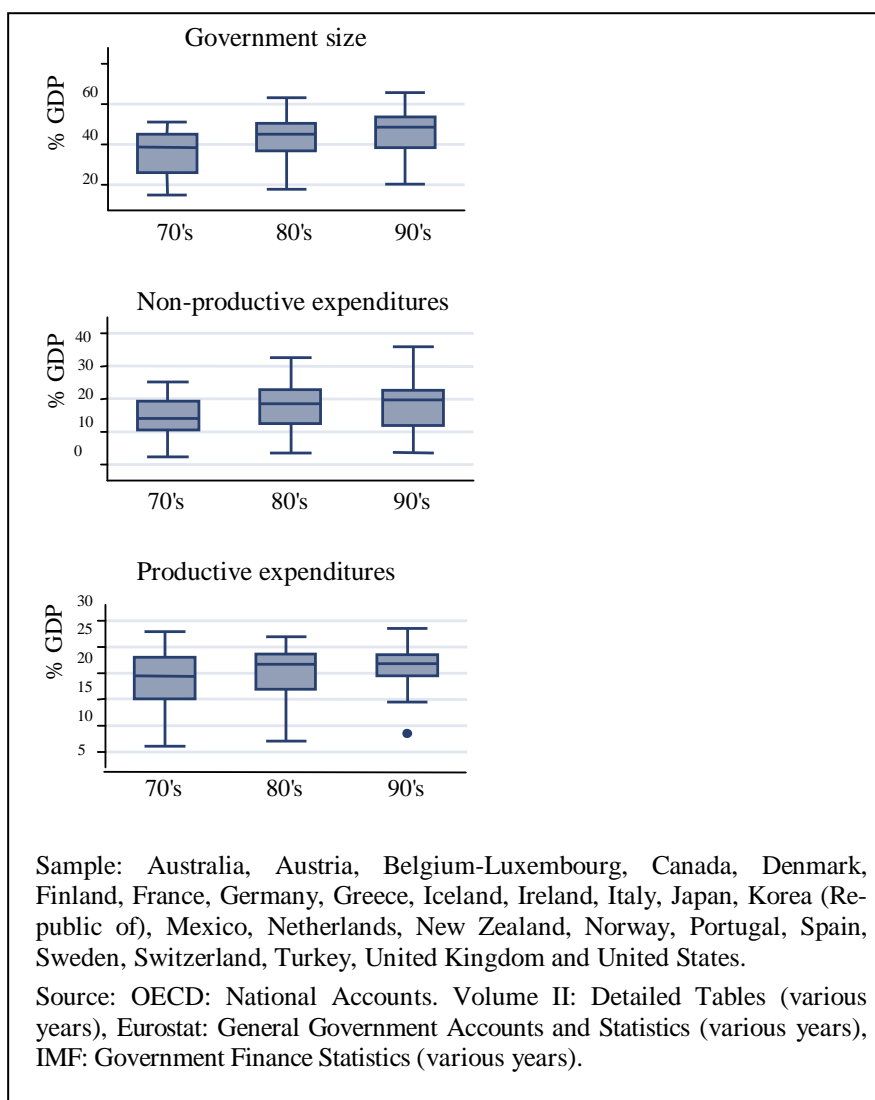
penditure share as a result of the fiscal discipline implemented in the OECD countries. Certainly, EU Member States signed the Stability and Growth Pact, 1996, which constrained their public deficits and debt levels, whereas the United States adopted the Balanced Budget Amendment. In the vertical axis we map the aggregate, productive and non-productive expenditures as shares of GDP. The box indicates the inter-quartile range containing from the 25th percentile to the 75th percentile of the distribution, so that it shows the range of expenditure shares that apply to half of the countries. The horizontal lines crossing the boxes locate the medians and the whiskers mark upper and lower adjacent values. The upper (lower) adjacent value is the largest (smallest) data point that is not greater (lesser) than the top (bottom) quartile plus 1.5 times the inter-quartile range. Box plots also indicate values that lie outside the upper and lower adjacent values.

So, as Figure 1 reveals, between the 70's and the 80's there was a reduction in the inter-quartile range in government size across OECD countries, but an increase in the length of the whiskers. The dispersion inside the inter-quartile diminished, but the whisker's size increased. The net effect in the dispersion is, hence, ambiguous. The median government size and upper adjacent values significantly increased in the 80's compared with the 70's. Thereafter, in the 90's there was not any relevant change in the distribution of public sector size across OECD countries. Overall, the dispersion between the 90's is not significantly different from that of the 70's.

There is much clear evidence of convergence in the case of productive government expenditures. In fact, Figure 1 shows that there has been a convergence towards the top levels of productive expenditures across OECD countries in the period 1970-1997. There has been a steady reduction in the inter-quartile range and in the whisker's size. The median productive government expenditure rose in the 80's and to a much lower extent in the 90's. Furthermore, the upper adjacent values have been stable whereas the lower adjacent values have considerably reduced their lag with respect to the inter-quartile range. Indeed, the convergence of the lower adjacent values in the 70's has uncovered an outside value (Mexico) which has not caught up. Finally, the evolution of non-productive expenditure during the period 1970-1997 does not show any convergence pattern.

Figure 1 shows that there has been an increase in the share of GDP devoted to non-productive government expenditure for those countries in the upper adjacent values and in the inter-quartile range. Nevertheless, the lower adjacent values have remained fairly stable across periods.

Figure 1: Government size and expenditure composition across OECD countries

Sample: Australia, Austria, Belgium-Luxembourg, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Korea (Republic of), Mexico, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom and United States.

Source: OECD: National Accounts. Volume II: Detailed Tables (various years), Eurostat: General Government Accounts and Statistics (various years), IMF: Government Finance Statistics (various years).

To ensure our conclusions about the convergence process, we have computed the σ-convergence usually employed in the literature on per capita income convergence (Barro and Sala-i-Martin, 1992)[3].

Table 1: σ-convergence of total, productive and non-productive expenditures in the OECD (1970-1997)

	σ 1970	σ 1997	Variation	T_2 χ^2 (1)	T_3 $N(0,1)$
Total Government expenditure	0.383	0.265	-30.8	6.06**	1.12
Productive expenditure	0.398	0.248	-37.8	8.66***	1.53*
Non-productive ex-penditures	0.524	0.492	-6.1	0.22	0.17

*, **, *** Significant at a 1%, 5% and 10% level.
Source: OECD: National Accounts. Volume II: Detailed Tables (various years), Eurostat: General Government Accounts and Statistics (various years), IMF: Government Finance Statistics (various years).

In the context of our work, σ-convergence explores if the dispersion of government expenditures as a share of GDP among OECD countries has been reduced between 1970 and 1997. Dispersion is measured as the standard deviation of the logarithm of aggregate, productive and non-productive expenditures across OECD countries in 1970 and 1997. Moreover, we test the hypothesis that the variance of those expenditure has significantly decreased over time using the

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[3] The two most popular convergence measures are the σ-convergence and the β-convergence. The former is more restrictive than the latter. (De la Fuente, 2000) Indeed, β-convergence could indicate convergence in situations where dispersion has increased because of random shocks temporarily increasing the dispersion or countries approaching their steady-states with higher dispersion. Evidence of β-convergence may also reflect Galton's fallacy (Quah, 1993). The advantage of β-convergence is that it allows to evaluate how do other factors affect the convergence process (conditional convergence). We first analyse convergence in government expenditures using the more restrictive σ-convergence, and then evaluate the impact of international economic integration in convergence employing β-convergence.

Likelihood Ratio test (T_2) proposed by Carree and Klomp (1997) and the Variance Ratio test (T_3) proposed by Lichtenberg (1994)[4].

Table 1 corroborates that the dispersion in productive government expenditures among OECD countries has been significantly reduced between 1970 and 1997. Furthermore, T_2-statistic and T_3-statistic confirm that there has not been a convergence process in non-productive expenditures. Interestingly, the T_2-statistic indicates that OECD countries have significantly reduced their dispersion in public sector size. In contrast, T_3 suggests that this convergence is not significant. To sum up, there is evidence of convergence on productive expenditures, which is much less clear for aggregate government expenditures and there is no evidence at all of convergence on non-productive expenditures.

4. Factors conditioning the convergence in the composition of government expenditure.

The previous section has shown that there is only clear evidence of absolute convergence in productive government expenditures. But there still may be β-convergence, which is less restrictive, on aggregate and non-productive government expenditures. Thus, we evaluate whether countries that have higher government expenditures as a share of GDP increase (decrease) this percentage to a lesser (greater) extent than countries with lower government spending. Still, there are two types of β-convergence: conditional and absolute. The former is, in turn, less restrictive, since it takes into account other specific factors affecting government expenditures. The latter requires the existence of convergence even without considering other variables. So, there would be conditional β-convergence if the factors introduced in the equation along with the previous year government expenditure are significant. In this case, countries converge to different steady states, conditioned by

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[4] We compute the T_3 statistics taking into account that the variance in the first year and the variance in the last year are not independently distributed (Carree and Klomp, 1997). T_2 and T_3 tests perform better than the original test proposed by Lichtenberg for short time periods and small samples reducing the probability of committing a type II error.

these other factors affecting government expenditures. Among these factors conditioning convergence, we introduce two variables reflecting the international economic integration. First, we include productive (non-productive) government expenditures in the rest of the OECD as a determinant of productive (non-productive) government expenditures in each country. If this variable is significant, it would be indicative of a competition among OECD countries in growth-enhancing (utility-enhancing) expenditures. Secondly, we introduce the sum of FDI inflows in the OECD in each year. Thus, we analyze whether the increasing flows of FDI affects the allocation of government expenditure. FDI inflows are an appropriate variable to test the government spending implications of international economic integration. Indeed, the efficiency hypothesis predicts convergence towards the highest levels of productive expenditures and towards the lowest levels of social protection because of countries competence for attracting FDI. Rodrik (1998) and Garret (1998) opposes this prediction based on the fact that globalization increases the perception of economic insecurity to individuals and consequently it also raises the demand for social welfare expenditure. Precisely, Scheve and Slaughter (2002) show that the presence of foreign firms in the country, rather than trade openness, is the key aspect generating the perception of employment and economic insecurity. In fact, FDI might exhibit wild fluctuations whereas trade openness changes slowly over time. We take into account potential simultaneity between the government spending and the FDI variable, since multinationals might be attracted to those countries that spend more resources on productive expenditure.

We also consider domestic variables pointed out by the literature that analyze the factors affecting government expenditure: income per capita, relative prices between the public and private sector, the age structure of the population and preferences and institutional and historical factors specific to each country (Borcherding et al. 2004). As Alesina and Wacziarg (1998) we also introduce population to control for country size effects in government expenditure. Smaller countries have a larger share of public consumption in GDP and are also more open to trade accounts. Moreover, smaller countries might feel the competition pressure from economic integration to a higher extent than large countries, hence, devoting more resources

to productive expenditures. Aggregate government expenditures will be also included as a factor affecting the allocation to productive and non-productive expenditures. Along these lines, fiscal discipline has been shown to affect differently the components of government expenditures (Sturm, 1998). [5] Thus, the equation to estimate is:

$$\ln(G_{it}) - \ln(G_{i,t-1}) = \alpha + \beta \ln(G_{i,t-1}) + \zeta Y_{it} + \sum_{i=1}^{25} \gamma_i D_i + \varepsilon_{it} \qquad (1)$$

where G is productive, non-productive or aggregate government expenditures, Y is the vector of variables reflecting international economic integration and domestic factors that hold constant the steady state, D is a country dummy that takes the value 1 for country i and 0 otherwise, subscript $i=1,\ldots 25$ denotes the country and $t=1971,\ldots 1996$ denotes the year. Following Gemmell et al. (1999), relative prices are approximated by the ratio of the public sector deflator to the GDP deflator. The public sector deflator is the result of the weighted mean of the government investments deflator, public consumption deflator and public transfers, the latter represented by the consumer price index, all obtained from OECD: Economic Outlook. The per capita income (in Purchasing Power Parities of the 1995 dollar and in real terms of that year), population and government expenditure series are obtained from the OECD: National Accounts: Volume I. Main Aggregates, whereas the age structure of the population is taken from the OECD: Labour Force Statistics. We compute permanent income per capita since demand is based on permanent income rather than on temporary income levels (Peltzman, 1980). We approximate permanent income per capita by taking a three-year moving average, reducing the sample by two observations for each country. We use panel data techniques using intermediate years, which avoids the choice of an arbitrary base year (Bernard and Durlauf, 1996). Along with FDI inflows, other variables might also be endogenous. If there is a competition in government expenditure, then the composition of gov-

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[5] Including aggregate government expenditure as a determinant of its components is equivalently as assuming that government expenditure is chosen in two stages. In the first stage aggregate government is decided. Once aggregate government expenditure is set up, the composition of government expenditure is chosen. This assumption is also usual in the literature analyzing the composition of government expenditure or some of its components (Sturm 1998 and Baqir, 2002) including those adopting a consumer demand framework (Tridimas, 2001) or a voter-group decision model (Borge and Rattsø, 1995).

ernment expenditure in country *i* affects government expenditure in the rest of OECD countries.

Table 2: β-conditional convergence in total, productive and non-productive expenditures across OECD countries (1970-1997).

Determinants	Dependent variable. Log of first differences in government expenditures as a share of GDP:		
	Productive expenditures	Non-productive expenditures	Aggregate expenditures
Intercept	-0.339 (-0.45)	-2.05 (-1.69)	-0.376 (-0.52)
Log of lagged dependent variable	-0.114 (-4.28)	-0.263 (-9.65)	-0.153 (-5.36)
Log of total OECD Inflow FDI	0.005 (0.56)	-0.033 (-2.12)	-0.022 (-1.73)
Log of OECD expenditures	0.332 (3.19)	0.190 (2.19)	0.212 (2.93)
Log of Income per capita	-0.205 (-3.06)	0.158 (1.98)	0.001 (0.02)
Log of relative prices	0.802 (5.08)	1.126 (6.55)	0.569 (3.07)
Log of population	0.173 (1.99)	-0.173 (-2.07)	-0.043 (-0.54)
Log of government expenditures	-0.020 (-0.25)	0.137 (1.83)	-
Log of population older than 64 (%)	0.095 (0.91)	0.323 (2.37)	0.164 (1.81)
Log of population ounger than 15 (%)	-0.030 (-0.49)	0.337 (2.82)	0.048 (0.87)
Country dummies $H_0: u_k=0 \ \forall \ k \ \chi^2_{(23)}$	499.50 p-value=0.0000	6518.26 p-value=0.0000	299.64 p-value=0.0000
N. Observations	625	625	625
M1	-2.64	-1.84	-2.49
M2	-1.26	-0.27	-1.21
Hansen Test of overid. $\chi^2_{(319)}$	8.49 p-value=1.0000	18.42 p-value=1.0000	16.25 p-value=1.0000

White t-statistics robust to heteroscedasticity are reported below coefficients.

Income per capita also introduces simultaneity as government expenditure and its composition affect long run economic growth[6]. Thus, the econometric analysis will be performed by means of the system-GMM (GMM-SYS) estimator suggested by Blundell and Bond (1998). The GMM-SYS estimator increases efficiency by exploiting all the information by estimating equation (1) in first differences and in levels (Arellano and Bover, 1995). In the equation in first differences, endogenous variables are instrumented with their own lagged level values. In the equation in levels, endogenous variables are instrumented with their own first differences. Results from the one-step estimates are reported because the two-step estimates of the standard errors tend to be severely downward biased (Arellano and Bond 1991 and Blundell and Bond 1998).

As it can be seen from Table 2, the M2 tests do not reject the null hypothesis of absence of second-order serial correlation. Furthermore, the Hansen test statistic of over-identifying restrictions does not reject the validity of the instruments used. Results show that there has been a conditional convergence in productive, non-productive and aggregate government expenditures across OECD countries. Surprisingly, the speed of conditional convergence for non-productive expenditures is even higher than for productive government expenditures. That is, non-productive expenditures across OECD countries is rapidly converging towards different steady states. Variables reflecting international economic integration significantly affect government size and its composition. FDI inflows in the OECD significantly decrease non-productive expenditure whereas it does not significantly affect productive expenditures. Overall, FDI inflows diminish aggregate government expenditures. This result may be suggesting that FDI inflows constrain the government's ability to collect taxes and therefore reduces government expenditures. There is a growing interdependence of fiscal policies affecting the size and composition of government expenditures. Government expenditures in each country is significantly affected by government expenditures in the rest of OECD countries.

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[6] See Devarajan et al. (1996) and Kneller et al. (1999) for a study of the effects of composition of government expenditure on economic growth. This endogenous issue has not received much attention in empirical studies (Borcherding et al. 2004).

Thus, results show that there has been a race to the top on productive expenditures across OECD countries during the period 1970-1997. Countries significantly increase their share of GDP devoted to productive government expenditure when there are higher levels of productive government expenditures in the OECD. In fact, the magnitude of the impact of OECD productive expenditures on each country's productive expenditures is sizeable, 0.332. This finding is giving evidence of a competition on productive expenditures. As Tanzi (2000) suggest, this competition may have the aim of attracting FDI investments. OECD non-productive expenditures also significantly raise non-productive expenditures in each country. This result corroborates that after controlling for other factors affecting non-productive expenditures, there is also convergence in non-productive expenditures. This is reflected both in the significantly positive effect of non-productive expenditures of the rest of OECD countries and in the significantly negative effect of previous year non-productive expenditures. This evidence is consistent with the absence of absolute convergence found in the σ-convergence analysis. There is a rapid convergence in non-productive expenditures, but only among countries with similar per capita income, age structure of the population and preferences. This result reflects that countries such as Portugal and Spain with low social protection levels but increasingly similar economic conditions to the EU, have tried to reach the high social protection levels of their partners during the period 1970-1997. These countries began to build their welfare systems in the 80's whereas others already had their welfare systems in place. In fact, OECD countries built their welfare systems at different stages (Tanzi and Schuknecht, 1997). Consistent with this hypothesis, results show that permanent income per capita significantly increases non-productive expenditures. These findings suggest that international economic integration had not led to a "race to the bottom" on social welfare expenditure, at least until now.

Overall, we find that international factors have significantly affected changes in aggregate government expenditures. Thus, results show that OECD inflows have significantly decreases government size whereas OECD government size has increased government expenditure as a share of GDP in each country. Results for domestic

factors are in line with the literature. We find that permanent income per capita does not affect the size of government. This finding does not refute Wagner's Law, since this law predicts that at some stage of development an upper limit for government size is reached (Peacock and Scott, 2000). Permanent income per capita increases non-productive expenditures confirming that Wagner's law is especially applicable for social welfare. Relative prices increase the share of government expenditure, as predicted by Baumol's conjecture. [7] Population is negatively associated with aggregate government expenditure, as hypothesized by Alesina and Wacziarg (1998) but not to a significantly degree. The public good character of government expenditure is offset by the reduction of tax prices follow by raises in country size (Borcherding et al., 2004). Population increases productive government expenditure showing that most of these expenditures are merit goods, such as health and education expenditure. Moreover, this result suggests that small countries do not devote more resources to expenditures such as education and transport and communications which could shield them from globalisation. Government size increases non-productive expenditures suggesting that social welfare expenditure is the most expenditure-elastic (Borge and Rattsø, 1995). Finally, the age structure of the population seems to be of particular relevance for non-productive expenditures. As expected, an elderly population significantly increases non-productive expenditures, which mainly includes social welfare spending. As the fraction of the population aged 65 and over raises, the proportion of voters demanding social security payments increases because the retired are net beneficiaries of these transfers (Lindert, 1996). Results also show that a young population significantly raises social security, confirming the relevance of family and child benefits in the social welfare spending (Than Dang et al, 2001).

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[7] Baumol (1967) observed that, because its low capitol-labour intensity, productivity growth was lower in the public sector than in private sector, while wage increase was similar. Hence, the share of government spending in GDP will tend to grow.

5. Conclusions

Slemrod (2004) shows that there has been a convergence process in corporate tax rates, evidencing a tax competition due to international competitive pressures. In this article, we have analyzed whether these international competitive pressures have led to any government expenditure competition. The results obtained, by means of the Tukey box-plot, σ-convergence and conditional β-convergence, reveal that there is a growing fiscal interdependence among OECD countries. There has been a significant convergence towards the top levels of government productive expenditures among OECD countries during the period 1970-1997. The econometric analysis shows that OECD productive expenditures have pressured countries to increase their own levels of productive expenditures. This is a strong evidence of competition on productive expenditures among OECD countries, which might be indicating a competition to attract FDI. Non-productive expenditures do not show any absolute convergence. Nevertheless, after controlling for factors affecting the allocation to non-productive expenditures, the conditional β-convergence analysis reveals that there has been a rapid conditional convergence. Moreover, international economic integration seems to have influenced government expenditures in different directions. On one hand, FDI inflows decrease non-productive expenditures. On the other hand, OECD non-productive expenditures increase non-productive expenditures in each country. One possible explanation for this finding is that OECD high-income countries maintained their social protection expenditure at some level of saturation while relatively OECD poor countries, but increasingly converging, have tended to raise their protection levels. However, governments may not be able to continue financing the current levels of social protection if international competitive pressure persists. Reducing the social welfare system may diminish the support for further international economic integration (Scheve and Slaughter, 2006).

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