

# The equity reasons for fiscal (de)centralisation<sup>(\*)</sup>

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## **Abstract**

The aim of this paper is to analyse the influence of regional economic disparities on the fiscal decentralisation processes in 21 OECD countries over the period 1981-2005. We use novel and robust measures of fiscal decentralisation based on differences in the degree of both expenditure and tax autonomy. Our results show that high regional economic disparities call for lower fiscal decentralisation and highlight the importance of the nature of both expenditure and tax decentralisation. More importantly, the extent to which responsibility and decision powers are really left to sub-central governments appears to be crucial. Thus, from a positive point of view, equity considerations suggest avoidance of fiscal federalism in countries with substantial regional economic disparities, notwithstanding the well-known efficiency gains.

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## 1. Introduction

The existing political, legal, and fiscal institutions are currently undergoing significant changes in many developed countries. Countries such as Belgium, Italy and Spain have recently undertaken policy decentralisation reforms in order to increase the autonomy of sub-central governments and reduce the inefficiencies of centralised fiscal policy (i.e., localised “pork-barrel” spending and taxes). The move towards greater fiscal federalism appears to be motivated by the need for a more efficient use of public resources by assigning policy control to the local level, with additional positive results for economic development within a country (see, for example, Stigler 1957; Musgrave 1959; Oates 1972; Bahl and Linn 1992).

The traditional theory of fiscal federalism (Tiebout 1956; Buchanan 1965; Oates 1972) and the more recent political economy literature (e.g., Alesina and Spolaore 1997; Mueller 2003) claim that federalism is the optimal institutional structure for any country of moderate size and preference heterogeneity. This is a result of both the minimization of the transaction costs of gathering information on voter preferences on public services (from the normative point of view) and the improved allocation of resources in the public sector (see also Oates 2008).

It is worth noting that political decentralisation (i.e., political autonomy granted usually by a constitution) is different from fiscal (i.e., economic) decentralisation. The latter refers to the outputs associated with the demands for public services made by the residents of various jurisdictions (Oates 1972). In other words, fiscal decentralisation refers to the nature of the outcomes, while political decentralisation is the process through which these outcomes are determined. Depending on the structure of political decentralisation we may distinguish between federalist and centralised countries.

In this paper, we concentrate on fiscal decentralisation and its main determinants, instead of looking at the reasons behind the political/federalist choices of the countries. In particular, we test whether the level of regional economic disparities within a country affects the incentives for tax and expenditure decentralisation, a phenomenon that may occur in centralised and federalist countries equally. We fill a gap in the literature highlighted by Arzaghi and Henderson (2005, p. 1161) who remark that “there is an enormous normative literature on the role of regional governments (...). However, the positive issue of why and when decentralisation occurs has received much less attention”.

Indeed, heterogeneous preferences across regions may lead individuals to favour decentralisation due to the potential welfare gains from diversifying local public outputs in accordance with local circumstances (Oates 1972). At the same time, high geographical economic disparities may increase the desire for greater regional autonomy and fiscal decentralisation (Bolton and Roland 1997). On the other hand, a different trend may emerge in the presence of high regional inequality. If some communities are too poor to provide certain public services (e.g. health, education), a Pareto

improvement may be reached by transfers of funds from rich communities by the central government in order to finance at least minimum levels of these services across the country (Buchanan 1950; Mueller 2003). Hence, from an equity-enhancing perspective, greater economic disparity between sub-national governments may work against decentralisation processes instead of favouring them.

The role of income inequality in determining fiscal decentralisation actually appears to be neglected by the existing empirical literature, with only few recent exceptions. Beramendi (2003, 2007, 2008) and Stegarescu (2009) study the role of income inequality and regional per capita income disparities in shaping the decentralisation processes, while Pommerehne (1977) looks at the influence of ethnic heterogeneity. More generally, there is a large and growing literature on the determinants of fiscal decentralisation. However, the results of these studies appear to be inconclusive (see Letelier 2005 for a detailed survey). A common feature of almost all empirical studies on fiscal decentralisation is the misrepresentation of the extent of revenue/expenditure autonomy of sub-central governments ignoring the effective powers of local governments (a notable exception is Stegarescu 2009).

This is due to the data commonly used to measure fiscal decentralisation, i.e. the share of sub-national governments' revenues/expenditures over those of the general government taken from the *Government Finance Statistics* published by the IMF. These indexes neglect the distribution of decision-making powers and, as a consequence, overestimate the degree of fiscal decentralisation in a country. As argued by Oates (1972), at the beginning of the fiscal federalism tradition, local governments may collect revenues or spend without any autonomy in deciding the amount of taxes to be collected or the type of expenditure.

The novelty of our paper is the utilization of new indexes of fiscal decentralisation (constructed by Stegarescu 2005 and by Gemmell *et al.* 2009) that are able to distinguish between tax and expenditure decentralisation and also take into account the various degree of autonomy granted to sub-central governments. We investigate the influence of regional economic disparities on tax and expenditure decentralisation for a sample of 23 developed countries over the period 1981-2005. The motivation of our analysis lies mainly in the lack of attention given by the previous empirical literature to the role of equity/inequality considerations in determining the incentive for fiscal decentralisation, outside of the well-known efficiency-related reasons for moving towards it. In terms of the regional economic disparities data, we use three different measures to ensure the robustness of the results to their relationship with fiscal decentralisation.

We find that regional economic disparities are negatively associated with fiscal decentralisation. In other words, a higher level of economic heterogeneity across regions within a country is associated with lower levels of decentralisation. The supporting evidence is particularly convincing when we analyse decentralised taxes and expenditures over which sub-central governments exert real powers, while results are less clear when we concentrate on broader measures of decentralisation. In terms of equity considerations, it seems that that rising economic heterogeneity across regions may require intervention from the highest level of government in order to guarantee a higher level of equality of

resources across different regions - through expenditure tools (see also Mueller 2003) and tax instruments. Additionally, this finding is close to the seminal prescription by Tiebout (1956), according to which higher income groups and regions can use fiscal decentralisation to protect themselves against undesired local redistributive policies.

The fact that our results are stronger with narrowly-defined decentralisation indexes highlights the importance of cross-country differences over the institutional structure of decentralisation. Stegarescu (2005, p. 304) correctly states that “[a] system where sub-central levels of government have real autonomy to determine the allocation of their expenditure or to raise their own revenue is more decentralised than another system where local or regional government spending and revenue are determined by national legislation, even though the formal assignment of functions or revenues might be the same”.

In summary, the negative effect of regional disparities on fiscal decentralisation suggests that, for equity reasons, higher economic disparity across sub-national governments may favour centralisation processes within a country; this also seems to concur with the existence of institutional conflicts in presence of different local resources (e.g. in Italy, Belgium and Spain), according to which rich regions would prefer to redistribute less, while poor ones would get more through implicit transfers mechanisms (see also Bolton and Roland 1997).

The remainder of the paper is organised as follows. Section 2 reviews the existing literature on the main determinants of fiscal decentralisation, with special attention devoted to the role of regional income disparities. Section 3 describes the empirical strategy and the variables used. Section 4 discusses the estimation results. Section 5 provides some concluding remarks and policy implications.

## **2. Inequality and other determinants of fiscal decentralisation**

There are many studies devoted to the investigation of the determinants of fiscal decentralisation. Although far from being a consensus, the theoretical literature has identified some key determinants of fiscal decentralisation such as country size, income per capita, differences in preferences and ethnic fractionalisation, the level of democracy (Panizza 1999).

Theories attempting to explain secessions (as an extreme example of devolution/decentralisation processes) and the optimal size of countries suggest that heterogeneous preferences for redistributive policies may also influence the decentralisation decisions (Alesina and Spolaore 1997; Spolaore 2008). The link between heterogeneity of individual preferences and income distribution/inequality appears to be a key element shaping the countries’ decisions either to join or separate. Indeed, demand for decentralisation may be driven by some regions’ higher preferences for redistributive policies, depending on local economic disparities (Bolton and Roland 1997; Beramendi 2003). For instance, fiscal decentralisation may be “used” by higher income groups and regions to protect themselves

against undesired redistributive policies. Tiebout (1956) states that the “voting by feet” process diminishes the incentives for net fiscal redistribution (through taxes and the provision of public goods and services) in communities with high levels of income. Hence, a highly decentralised system is less likely to reach regional agreement to implement significant equalisation policies (Martinez-Vazquez 1982).

To some extent, these ideas are in line with one of the corollaries of the “Decentralisation Theorem” (Oates 1972), according to which the benefits of decentralisation are positively correlated with the inter-regional variance in demands for publicly provided goods. Decentralisation-enhancing reforms are also determined by political motivations which view fiscal decentralisation as a remedy to central government failures and as an efficient tool to solve certain national problems such as ethnic conflicts and/or separatism issues (Sepulveda and Martinez-Vazquez 2011). Shah (2004) also sees fiscal decentralisation as a way of strengthening democratic political institutions and basic civil rights.

The economic intuition lies in decentralisation being a desirable but expensive good - superior/luxury good - that can only be afforded by affluent societies with rising income (Wheare 1964; Tanzi 2000). In these cases, demand for variety and quality in the spectrum of public services is likely to increase as economic development not only stimulates the demand for local service delivery, but also increases the revenue raising capacity of governments, making decentralisation affordable. As observed by Panizza (1999), a positive effect of income on fiscal decentralisation arises when confronting the national median voter’s preferences with a budget-maximising Leviathan type of government. In short, as the median voter’s income rises, it also raises her demand for spending. However, the median voter will prevent the realisation of the government’s rents by forcing more decentralisation, which diminishes the power of government to administer the budget (Letelier 2005).<sup>1</sup>

With so many different avenues suggested by the theoretical literature, it is unsurprising that the empirical literature has used a wide range of different specifications to investigate the determinants of fiscal decentralisation. Table 1 reports a number of different variables which have been found to significantly affect fiscal decentralisation decisions. For each variable, we report the type of relationship that has been found, and the article of interest.<sup>2</sup>

*Insert Table 1 about here*

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<sup>1</sup> The government is supposed to take the lead in deciding the level of fiscal centralisation by taking advantage of its agenda-setting condition. This depends on the national median voter’s preferences regarding the type and level of government expenditures. Since the government obtains rents from staying in office, there will be a hedge between the median voter’s demand for government and the government’s optimum.

<sup>2</sup> We took advantage of the work of Letelier (2005): Table 1 extensively draws from Table 1 in that article (Letelier 2005, p. 162).

Although results are mostly mixed, there are several empirical regularities. For example, most studies find a positive relationship between fiscal decentralisation and per capita income, with only a couple of articles concluding in favour of an uncertain relationship (Pryor 1967; Beramendi 2003).

Nevertheless, there are some caveats that must be taken into account when looking at this positive relationship. Letelier (2005) notes that, as income rises, societies tend to desire a greater degree of income redistribution and socially oriented policies. Combined with an increasing demand for infrastructure to facilitate higher standards of living, this may increase the pressure for funds to be redistributed by higher levels of government. Due to the significant externalities involved in the provision of this kind of public goods, some displacement of expenditure from the lower to the higher levels of government is likely to occur and, as a consequence, decentralisation-enhancing reforms are less likely to occur.

This appears to be confirmed by Wallis and Oates (1988), who found a positive relationship between fiscal centralisation and the level of per capita income in the US. Higher-income states are more likely to engage in redistributive activities which tend to have a disproportionately large role for the state. However, some rich countries are in practice extremely decentralised (e.g., Switzerland, the United States, Canada), while others are highly centralised (e.g., France). According to Panizza (1999), the main problem with mixed empirical results is their sensitivity to outliers (Yugoslavia, in his case) and to different samples. Likewise, Bodman and Hodge (2010) find that the relationship between income and fiscal decentralisation in the OECD countries is different from that in middle and low income nations. A positive relationship is estimated for the former group, but a negative one seems to hold in the latter group of countries. Bahl and Linn (1992) find similar results, suggesting that there exists a high threshold level of development over which countries begin to decentralise.

Many forces other than income can be thought to influence the fiscal decentralisation processes of a country. As a consequence, many other explanatory variables have been tested as determinants of fiscal decentralisation in the empirical literature: population, country size, ethnic fragmentation, urbanisation, trade openness, unemployment, and intergovernmental grants. Robust evidence seems to exist for a few of these (e.g., the positive relationship between country size and fiscal decentralisation), but for the majority of the variables, the results are mixed. This may be due to the various specifications that have been used to investigate the causes of fiscal decentralisation, different samples, different time spans under analysis. As an example, Pommerehne (1977) concludes that only population appears to be systematically significant and positively related to fiscal decentralisation, whereas the effects of all remaining variables are sensitive to the specific model being tested, showing ambiguous signs and non-significant coefficients. Likewise, Wallis and Oates (1988) affirm that the extent of fiscal centralisation is inversely related to both population size and urbanisation: their growth seems to create pressures for more decentralised government.

Table 1 also shows that inequality has rarely been related to the evolution of fiscal decentralisation. Beramendi (2003, 2007, 2008) highlights that the political process might make

decentralisation endogenous to inequality and its geographical structure: it may not be the case that it is “decentralisation that causes inequality, but rather pre-existing economic inequalities that drive the decentralisation of the welfare state, which in turn reproduces the pre-existing patterns of inequality” (Beramendi 2007, p. 786). Beramendi (2008) suggests that inequality is positively associated with decentralisation when political parties are highly centralised at the national level and/or sub-national representatives at the national level are directly elected. Conversely, as the balance of power between local and national elites becomes more equal (e.g. federations with an integrated party system), inter-regional differences in the incidence of inequality are less and less reflected in the actual fiscal design of institutions.

Beramendi (2003, 2007) refers to the link between regional disparities and the preferences for decentralisation of redistributive policies. According to this idea, differences in the demand for redistribution are associated with regional income disparities. The main research question is the following: how does the structure of inequality determine the incentives for more/less decentralised welfare policies? Beramendi (2007) finds a positive relation between regional inequality and the degree of decentralisation of redistribution in OECD countries.<sup>3</sup> Underlying causes of this diversity may be traced back to factors such as differences in language and ethnicity (Bodman and Hodge 2010).

Whether or not fiscal decentralisation is determined by regional disparities is an issue worth investigating. Until now, the limited availability of disaggregated data capable of capturing the level of regional inequality within countries with different degrees of fiscal (and/or political) decentralisation has restricted the possibility of accurate empirical testing. Through our empirical analysis we offer a contribution in this direction. We follow the “new” approach of considering various measures of fiscal decentralisation taking into account both sides of the budget and which are also capable of discerning the real level of autonomy granted to sub-central governments in line with some pioneering previous studies (Letelier 2005; Stegarescu 2009; Bodman and Hodge 2010).

### **3. The empirical strategy**

The aim of our empirical analysis is to investigate the determinants of fiscal decentralisation in 21 OECD countries for the period 1981-2005. Among the various explanatory variables that can affect the decentralisation process, we are particularly interested in the role played by regional economic disparities, about which there is much ongoing research (see, among others, Lessman 2009, Rodriguez-Pose and Ezcurra 2010). Our model tests whether regional economic disparities can affect

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<sup>3</sup> A similar mechanism has been suggested by Panizza (1999) from a theoretical point of view: different preferences across communities may help determine the level of effective decentralisation, assuming that a more heterogeneous population is more likely to prefer a higher level of expenditure decentralisation.

the decisions of the country with regards to granting a lower/higher degree of revenue and/or expenditure autonomy to local governments.

The measurement of regional economic disparities is not an elementary task. In our benchmark specification we use the population-weighted coefficient of variation (CV), which measures the standard deviation of per capita regional GDP within a country divided by the country's per capita GDP level. It is a good measure because it is independent of the scale, population size, number of regions and satisfies the Pigou-Dalton principle (Cowell 1995).<sup>4</sup>

Our analysis is based on the following model:

$$FD_{i,[t-t+4]} = \alpha_{i,0} + \alpha_{i,1}REGDISP_{i,t} + \beta'_{i,j}\mathbf{X}_{i,t} + v_{i,t}, \quad (1)$$

where  $FD_{i,[t-t+4]}$  denotes the five-year averages of a measure of fiscal decentralisation (see below for details);  $REGDISP_{i,t}$  stands for the level of regional economic disparities within a country;  $\mathbf{X}$  is a set of covariates that can affect fiscal decentralisation such as: a) *GOVSIZE* is government size; b) *GDPPC* is the country's per capita GDP; c) *OPEN* is trade openness; d) *POPGR* stands for population growth; e) *EDUC* is the average number of years of total education; f) *LEFT* and *RIGHT* are two dummies that represent the ruling political party (they are equal to 1 in each period when there has been a majority of either left or right orientation in the cabinet; the reference category being a balanced cabinet).<sup>5</sup> Country-fixed effects ( $\alpha_{i,0}$ ) are included to control for country-specific patterns and time-invariant determinants of the decentralisation process, such as country size and institutional factors like being a federal country;  $v_{i,t}$  is the disturbance term.

Equation (1) is estimated over 5-year non-overlapping periods (1981-1985, 1986-1990, 1991-1995, 1996-2000, 2001-2005). The use of this technique permits the smoothing of business cycle fluctuations and improves the quality of the fiscal decentralisation variable (that has some missing values - see Easterly 1999; Higgins and Williamson 1999; Reuveny and Li 2003). Moreover, it allows us to deal with reverse causality by expressing the dependent variable as the five-year average value of the period, while the initial period values are used for all the explanatory variables.

It is also important to clarify how we measure the dependent variable, fiscal decentralisation. We use ten different and novel indicators that distinguish between expenditure and tax decentralisation. They are all constructed following the standard logic of ratios of sub-central expenditures/tax

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<sup>4</sup> For applications of this measure see, e.g., Ezcurra and Pascual 2008; Rodriguez-Pose and Ezcurra 2010; Kyriacou

and Roca-Sagales forthcoming). The exact formula is the following:  $CV = \frac{1}{y} \sqrt{\sum_{i=1}^n p_i (\bar{y} - y_i)^2}$ , where  $y_i$  is per capita GDP of each of the  $n$  regions in the country.

<sup>5</sup> In principle, a variable capturing the quality of the governance could have entered the equation as a control. However, governance quality data going back to 1980 are hard to find (e.g. the widely used governance indicators by Kauffmann *et al.* (2004) start in 1996. However, we believe that controlling for the balance of power in the country can be an effective control for the political side of the determinants of fiscal decentralization.

revenues over general government's expenditures/tax revenues, but some also take into account the actual degree of autonomy given to sub-national governments over tax and spending decisions. In this way, they may solve the (well-known) shortcomings of the IMF fiscal decentralisation data - widely used in previous empirical studies - which tend to overstate the degree of sub-central autonomy and responsibility (for other details, see Ebel and Yilmaz 2003).

Seven of the indexes are taken from Stegarescu (2005), and the other three are taken from Gemmell *et al.* (2009). Although the indexes built by Stegarescu are more informative (especially on the revenue side), they are measured only up to 2000 (at most)<sup>6</sup>, while those constructed by Gemmell *et al.* (2009) permit us to extend the analysis to 2005. On the expenditure side, we adopt four different indexes, *ED1*, *ED1S*, *ED2*, *ED2S*. *ED1* is the broadest measure; it is calculated as the ratio of the sub-central governments' expenditure (minus the transfers to other levels of government) over the general government total expenditure (minus the intergovernmental transfers). Hence, *ED1* reports only amounts spent directly by sub-national governments but not necessarily financed with own local resources. *ED1S* adds social security transfers to *ED1*. *ED2* is a narrower measure of expenditure decentralisation, being *ED1* adjusted for grants received from central government. Thus, *ED2* only takes into account self-financed expenditures. Again, *ED2S* includes social security transfers. Moreover, we include in the analysis the more recent expenditure decentralisation indexes by Gemmell *et al.* (2009): *extED2S* ("self-financed spending", p. 19) and *extED1S* ("direct spending", p. 19).<sup>7</sup>

On the revenue side, we use three tax decentralisation indexes (*TD1*, *TD2*, *TD3*), where the narrowest measure is *TD1*: this is the share of sub-central governments' own tax revenue over the total (national) tax revenue. This measure only takes into account the revenues over which local governments have complete autonomy. *TD2* is a broader measure. It differs from *TD1* in that it also includes shared tax revenues. Finally, the broadest measure (*TD3*) is the "conventional" ratio between sub-central governments' total tax revenues and national total tax revenues. This means that this index can capture the revenues that are collected at the local level but decided entirely by the central government. Once again we are able to extend the coverage period of our analysis by using an index built by Gemmell *et al.* (2009). It is a broad revenue decentralisation index that is highly correlated with *TD3* (we label it *extTD*).

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<sup>6</sup> We thought about extending the tax decentralisation indexes beyond 2000 but it proved impossible to do so, due to the fact that crucial information that Stegarescu (2005) used to construct such indexes was contained in an OECD (1999) study that has not been updated since then.

<sup>7</sup> One shortcoming of all these indexes (by Stegarescu 2005 and Gemmell *et al.* 2009) is that there is no distinction between regional and local governments: all tiers of sub-national governments (i.e., regions, states, provinces, counties, territories or districts municipalities, communes or local councils) are aggregate into a single group. This horizontal aggregation does not take into account the number of participating sub-central governments and the differences in competencies among them. Probably, a more correct measure of fiscal decentralisation might consider the horizontal disaggregation of fiscal data by jurisdictions. Yet, the main difficulty with this involves finding such indicators that are comparable across countries. In short, the relationships among different levels of local governments in each country are not observable in this exercise, but this goes beyond the scope of the paper.

Table 2 contains some descriptive statistics of the variables.

*Insert Table 2 about here*

## 4. Results and discussion

### 4.1 Benchmark results

Table 3 reports the estimates of the different specifications of the model of equation (1) using all the six expenditure decentralisation indexes as the dependent variable one at a time. Table 4 reports the estimates of the four different tax revenue decentralisation specifications.

*Insert Table 3 and Table 4 about here*

The results show that regional economic disparities directly affect fiscal decentralisation, as the estimated coefficients associated with the former are negative in all specifications. Another important result is that coefficients differ - in magnitude - not only according to the nature of the decentralisation process (i.e., tax-*vs*-expenditure), but also according to the level of autonomy granted to the sub-national units of government. Indeed, the regional disparities coefficients of the models which use the indexes that more correctly represent the actual autonomy of local governments (*TD1*, *ED2*, *ED2S* and *extED2S*) are highly statistically significant and larger than those of the other specifications.

On the other hand, regional disparities seem to play a less important role in affecting fiscal decentralisation when measured with broader indexes that do not focus on local taxes/expenditures over which the sub-central governments have complete decisional powers. This suggests that higher regional disparities are associated with fewer powers given to sub-central governments. On the expenditure side, it seems that central government grants to lower levels units (included in *ED1* and excluded in *ED2*) tend to be barely substituted by own financial resources when there are high regional economic disparities.

An additional finding suggested by the different magnitudes of the decentralisation coefficients is that decentralisation of expenditures plays a more crucial role than that of taxes. Indeed, the experience of many industrial countries shows that successful fiscal decentralisation reforms cannot be achieved without a well-designed fiscal transfers program (Shah 1999, 2004). When sub-national governments are unlikely to have enough own revenues to finance their expenditures, transfers from the central government are necessary. Thus, it suggests that higher regional income disparities call for some kind of intergovernmental transfers (or equalisation systems), which can be facilitated by greater centralisation.

As for the rest of the right hand side variables, the importance of both education and population growth is consistent across all specifications, with positive and sometimes statistically significant coefficients. Results are less clear for the other controls, with high standard errors that do not permit us to draw a coherent picture of their effects on fiscal decentralisation.

Our finding of a negative relationship between fiscal decentralisation and regional economic disparities may seem quite surprising and requires an explanation. In fact, it contrasts with the traditional theory according to which some kind of heterogeneity - e.g. of preferences (Oates 1972) - calls for different provisions of public policies across regions (i.e., greater decentralisation) leading to regional disparities according to efficiency reasons. Indeed, we may expect that as preference heterogeneity may favour decentralisation attitudes, high territorial income disparities may increase the desire for fiscal decentralisation based on efficiency considerations. Interregional differences - also increasing as a consequence of economic integration and regional specialisation (Stegarescu 2009) - can enhance the benefits of decentralisation.

However, considering the trade-off between equity and efficiency, the following intuition can be provided. On equity grounds, higher income heterogeneity across regions may require an intervention of the highest level of government in order to guarantee an equal redistribution - possibly through expenditure tools. In other words, within the same country rich regions could support greater fiscal decentralisation characterised by more autonomy and power to spend in their own territory, while poor regions would need a more coordinated and cooperative (i.e. centralised) institutional system in order to satisfy their demand for income redistribution, social policies, infrastructures, and analogous public expenditures. The final effect on fiscal decentralisation depends on which of the two groups will prevail.

As pointed out by Bolton and Roland (1997), whereas well-endowed regions benefit from extended fiscal autonomy and competition that permits an escape from interregional redistribution through national taxes, poor unproductive regions would call for central government support and income redistribution. Therefore, a key point continues to be the following: fiscal decentralisation may be "used" by higher income groups and regions to protect themselves against undesired redistributive policies. Hence, a highly decentralised system is less likely to reach regional agreement to implement significant equalisation policies (Martinez-Vazquez 1982; Sepulveda and Martinez-Vazquez 2011). On the other hand, high levels of central government expenditure are likely to be associated with the presence of strong and generous redistributive regimes. The importance of centralised income redistribution policies in more developed countries has been recognised also by Arzaghi and Henderson (2005).

To some extent, our findings are also in line with those of Stegarescu (2009) and Letelier (2005). Indeed, the former shows the centralising effect of growing regional income disparity as regional disparity of per capita GVA has a highly significant negative coefficient on the decentralisation measures. In turn, according to Letelier (2005), improving standards of living and rising income (such

as those recorded in the countries of our sample) may lead to changes in the demand for public goods with increasing emphasis on income redistribution and socially-oriented policies. These kinds of expenditures are likely to be better implemented by the central government, leading to lower degrees of decentralisation.

Hence, the results of our empirical analysis highlight the important role of equity considerations in shaping the causes of the adoption of fiscal decentralisation. Equality and decentralisation appear to be two clashing issues, at least to some extent. Indeed, inequality - here measured by regional economic disparities - seems to call for less decentralisation of both taxation and public spending. This also means that countries with high regional economic disparities should not use fiscal decentralisation as a tool to try to reduce them.

#### 4.2 Robustness checks

This section is devoted to the examination of the robustness of our results. First, we re-estimated the model described by Equation (1) using two alternative measures of regional economic disparities, i.e. the Theil index calculated using per capita regional GDP - *Theil* - and the population-weighted standard deviation of the logarithm of per capita regional GDP (Barro and Sala-i-Martin 1995) - *SDLog*.<sup>8</sup>

*Insert Tables 5 & 6 about here*

Tables 5 and 6 report the estimated *REGDISP* coefficients only for the sake of brevity, as the results for the rest of the covariates do not significantly differ from the benchmark results. These alternative estimates confirm the negative relationship between regional disparities and fiscal decentralisation, validating the additional result of a stronger link for the narrowly-defined decentralisation indexes. We also offer another robustness check aimed at dealing with possible cross-sectional correlation. Tables 7 and 8 report the estimates of the benchmark model using Feasible Generalised Least Squares (FGLS) with fixed effects and controlling for heteroskedasticity. Once again, our main findings are maintained.

*Insert Tables 7 & 8 about here*

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<sup>8</sup> The formulas are the following:  $Theil = \sum_{i=1}^n p_i \ln\left(\frac{\bar{y}}{y_i}\right)$  and  $SDLog = \sqrt{\sum_{i=1}^n p_i (\ln(\bar{y}) - \ln(y_i))^2}$ , where  $p_i$  is the population share of each of the  $n$  regions in the country.

## 5. Conclusions

In this paper we analyse the extent to which regional economic disparities affected the fiscal decentralisation processes in 21 OECD countries between 1981 and 2005 as many developed countries recently and simultaneously embarked on fiscal decentralisation processes. While the efficiency-related motives for these reforms have been widely investigated, equity-related considerations have been almost ignored in the literature. In other words, we try to verify whether regional inequalities can be seen as the driving force for the adoption of fiscal decentralisation in a country. In doing so, we pay particular attention to the nature of fiscal decentralisation, using several measures that take into account the various degrees of both expenditure and tax autonomy granted to sub-central governments.

Our results suggest that the extent to which sub-central governments have real autonomy to determine the allocation of their expenditure or to raise their own revenue appears to be crucial. Indeed, regional economic disparities are negatively associated with fiscal decentralisation. This means that higher levels of economic heterogeneity across regions contribute to lower degrees of decentralisation, a finding that may at first seem surprising. However, some possible explanations based on equity considerations can be advanced: rising economic inequality across regions may require an intervention of the highest level of government in order to pursue redistributive objectives, possibly through expenditures tools (i.e. equalisation transfer mechanisms as argued by Shah (1999, 2004)). A highly decentralised system is less likely to reach regional agreement to implement such policies (Martinez-Vazquez 1982; Stegarescu 2009; Sepulveda and Martinez-Vazquez 2011).

Our results identify potentially fruitful areas for future research. In particular, researchers should aim to better our understanding of the various implications associated with different types of decentralised expenditures (e.g., health, education...) and taxes (e.g., income, property...). This would imply decomposing the fiscal decentralisation measures by function and classification according to the degree of local discretion in legislation and execution. Studying less developed countries could also prove interesting. However, both of these directions of research require the availability of new and detailed data.

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## Tables and Figures

Table 1 - Literature review: the determinants of fiscal decentralisation

Variable	Estimated sign	References
Income per capita	Positive	Oates 1972; Kee 1977; Pommerehne 1977; Bahl & Nath 1986; Panizza 1999; Stegarescu 2009; Arzaghi & Henderson 2005; Letelier 2005
	Mixed	Pryor 1967; Wallis & Oates 1988; Beramendi 2003; Bodman and Hodge 2010
Population	Positive	Pryor 1967; Oates 1972; Pommerehne 1977; Panizza 1999; Arzaghi & Henderson 2005; Letelier 2005
	Negative	Bodman and Hodge 2010
	Mixed	Patsouratis 1990; Stegarescu 2009
Urbanisation	Positive	Pommerehne 1977; Bahl & Nath 1986
	Negative	Stegarescu 2009; Letelier 2005; Bodman and Hodge 2010
	Mixed	Arzaghi & Henderson 2005
Openness	Positive	Beramendi 2003, 2007
	Negative	Kee 1977
	Mixed	Stegarescu 2009; Bodman and Hodge 2010
Country size	Positive	Panizza 1999; Arzaghi & Henderson 2005; Beramendi 2007
Ethnic heterogeneity	Negative	Arzaghi & Henderson 2005
	Positive	Beramendi 2003, 2007
Unemployment	Negative	Stegarescu 2009
	Mixed	Oates 1972; Pommerehne 1977; Panizza 1999
Grants to local gov.ts	Positive	Kee 1977; Letelier 2005
	Mixed	Bahl and Nath 1986; Bodman and Hodge 2010
Overall income ineq.	Negative	Pommerehne 1977
Regional disparities	Positive	Beramendi 2003, 2007, 2008
	Negative	Stegarescu 2009

Table 2 - Descriptive statistics

		<i>N</i>	<i>Mean</i>	<i>Std Dev</i>			<i>Min</i>	<i>Max</i>
				overall	within	between		
<i>REGDISP</i>	<i>CV<sub>t</sub></i>	95	18.65	7.68	7.55	2.95	5.16	41.65
	<i>Theil<sub>t</sub></i>	93	1.95	1.50	1.43	0.56	0.13	6.82
	<i>SDLog<sub>t</sub></i>	95	17.86	6.69	6.34	3.24	5.24	40.33
<i>FD</i>	<i>TD1<sub>[t-t+4]</sub></i>	97	19.84	16.92	17.13	2.84	0.20	57.83
	<i>TD2<sub>[t-t+4]</sub></i>	97	23.93	17.85	17.86	3.99	0.20	61.21
	<i>TD3<sub>[t-t+4]</sub></i>	97	25.04	17.43	17.41	3.90	1.64	61.21
	<i>extTD<sub>[t-t+4]</sub> +</i>	100	23.09	13.87	13.99	2.13	3.41	53.34
	<i>ED1<sub>[t-t+4]</sub></i>	81	43.27	17.11	18.56	4.36	5.65	78.21
	<i>ED1S<sub>[t-t+4]</sub></i>	81	33.19	14.17	14.96	2.73	4.24	61.27
	<i>ED2<sub>[t-t+4]</sub></i>	81	28.42	16.47	17.10	3.64	3.54	64.53
	<i>ED2S<sub>[t-t+4]</sub></i>	81	22.34	13.38	13.60	2.62	2.64	54.30
	<i>extED1S<sub>[t-t+4]</sub> +</i>	100	33.18	15.25	15.19	3.31	4.32	62.74
	<i>extED2S<sub>[t-t+4]</sub> +</i>	100	22.87	14.29	14.34	2.64	4.10	54.79
<i>GOVSIZE<sub>t</sub></i>		105	9.69	2.41	2.35	0.70	4.68	16.69
<i>GDPPC<sub>t</sub></i>		105	24.82	6.01	4.70	3.86	11.72	44.27
<i>OPEN<sub>t</sub></i>		105	64.13	30.94	29.81	10.15	17.48	184.31
<i>POPGR<sub>t</sub></i>		105	0.80	2.30	0.99	2.08	-0.13	23.47
<i>EDUC<sub>t</sub></i>		105	9.35	1.72	1.60	0.71	5.54	12.71
<i>LEFT<sub>t</sub></i>		105	0.28	0.45	0.28	0.36	0	1
<i>RIGHT<sub>t</sub></i>		105	0.53	0.50	0.31	0.40	0	1

Note: T = five 5-year averages periods (1981-2005); N = 21 countries (Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, USA). + Gemmell *et al.* (2009) do not have data for Japan.

Source: Authors' elaborations

Table 3 - Dependent variable: expenditure decentralisation ( $FD_{[t-t+4]}$ )

	<i>ED1</i>	<i>ED1S</i>	<i>extED1S</i>	<i>ED2</i>	<i>ED2S</i>	<i>extED2S</i>
<i>CV<sub>t</sub></i>	-0.642* (-1.64)	-0.359 (-1.39)	-0.445* (-1.73)	-0.949*** (-2.70)	-0.648** (-2.31)	-0.386*** (-2.87)
<i>GOVSIZE<sub>t</sub></i>	0.724 (0.33)	0.662 (0.53)	0.413 (0.28)	-1.562 (-1.33)	-0.648 (-0.70)	0.184 (0.21)
<i>GDPPC<sub>t</sub></i>	0.176 (0.43)	0.250 (1.21)	0.230 (1.11)	-0.176 (-0.95)	0.061 (0.34)	0.139 (0.88)
<i>OPEN<sub>t</sub></i>	0.039 (0.50)	0.070 (1.52)	0.082*** (2.71)	0.039 (0.80)	0.036 (1.00)	0.025 (0.56)
<i>POPGR<sub>t</sub></i>	0.380* (1.72)	0.265* (1.72)	0.213 (1.33)	0.304 (1.47)	0.297* (1.80)	0.141 (1.36)
<i>EDUC<sub>t</sub></i>	2.660* (1.78)	1.125 (1.11)	0.938 (0.73)	2.967** (3.61)	1.568 (1.55)	1.336 (1.39)
<i>LEFT<sub>t</sub></i>	-1.457 (-0.77)	0.108 (0.09)	-0.621 (-0.42)	-1.194 (-0.49)	0.505 (0.48)	-0.462 (-0.49)
<i>RIGHT<sub>t</sub></i>	-2.855 (-1.11)	-0.870 (0.59)	-0.293 (-0.21)	-1.682 (-0.71)	-1.180 (-0.22)	0.412 (0.47)
Obs.	72	72	92	72	72	92
R <sup>2</sup> (within)	0.27	0.27	0.31	0.54	0.45	0.30

Note: *t*-statistics in parenthesis based on robust standard errors. \*\*\*, \*\*, \* denote significance at 1%, 5% and 10%, respectively. Country dummies included but not reported.

Table 4 - Dependent variable: tax revenue decentralisation ( $FD_{[t-t+4]}$ )

	<i>TD1</i>	<i>TD2</i>	<i>TD3</i>	<i>extTD</i>
<i>CV<sub>t</sub></i>	-0.489** (-2.17)	-0.725* (-1.66)	-0.689 (-1.60)	-0.322*** (-2.77)
<i>GOVSIZE<sub>t</sub></i>	0.792 (0.91)	-0.221 (-0.15)	-0.529 (-0.37)	0.742 (1.23)
<i>GDPPC<sub>t</sub></i>	-0.009 (-0.06)	-0.009 (-0.05)	-0.036 (-0.18)	0.062 (0.58)
<i>OPEN<sub>t</sub></i>	0.038 (1.14)	0.025 (0.64)	0.043 (1.12)	0.010 (0.33)
<i>POPGR<sub>t</sub></i>	0.268** (2.08)	0.339 (1.50)	0.300 (1.36)	0.179** (2.28)
<i>EDUC<sub>t</sub></i>	2.544*** (2.68)	2.844** (2.37)	2.531** (2.19)	1.460** (2.01)
<i>LEFT<sub>t</sub></i>	-0.590 (-0.43)	0.471 (0.35)	0.061 (0.05)	-0.155 (-0.22)
<i>RIGHT<sub>t</sub></i>	-0.584 (0.56)	0.692 (0.55)	0.407 (0.41)	0.496 (0.63)
Obs.	87	87	87	92
R <sup>2</sup> (within)	0.35	0.26	0.25	0.29

Note: *t*-statistics in parenthesis based on robust standard errors. \*\*\*, \*\*, \* denote significance at 1%, 5% and 10%, respectively. Country dummies included but not reported.

Table 5 - Dependent variable: expenditure decentralisation ( $FD_{[t-t+4]}$ ) with two alternative *REGDISP* measures

	<i>ED1</i>	<i>ED1S</i>	<i>extED1S</i>	<i>ED2</i>	<i>ED2S</i>	<i>extED2S</i>
<i>Theil<sub>t</sub></i>	-2.952 (-1.32)	-1.613 (-1.13)	-1.644 (-1.22)	-4.342* (-1.92)	-2.911* (-1.71)	-1.221* (-1.88)
Obs.	70	70	90	70	70	90
R <sup>2</sup> (within)	0.26	0.28	0.38	0.51	0.46	0.33
<i>SDLog<sub>t</sub></i>	-0.607 (-1.31)	-0.320 (-1.10)	-0.470* (-1.64)	-0.991** (-2.52)	-0.690** (-2.24)	-0.471*** (-2.63)
Obs.	72	72	92	72	72	92
R <sup>2</sup> (within)	0.24	0.23	0.29	0.46	0.39	0.31

Note: *t*-statistics in parenthesis based on robust standard errors. \*\*\*, \*\*, \* denote significance at 1%, 5% and 10%, respectively. Country dummies included but not reported. Only the *REGDISP* coefficients are reported for the sake of brevity; the results for the other covariates are similar to those of the benchmark specification.

Table 6 - Dependent variable: tax revenue decentralisation ( $FD_{[t-t+4]}$ ) with two alternative *REGDISP* measures

	<i>TD1</i>	<i>TD2</i>	<i>TD3</i>	<i>extTD</i>
<i>Theil<sub>t</sub></i>	-2.256* (-1.80)	-3.748 (-1.42)	-3.569 (-1.37)	-1.151** (-1.98)
Obs.	85	85	85	90
R <sup>2</sup> (within)	0.44	0.34	0.32	0.33
<i>SDLog<sub>t</sub></i>	-0.529** (-2.09)	-0.752* (-1.64)	-0.704 (-1.56)	-0.356** (-2.36)
Obs.	87	87	87	92
R <sup>2</sup> (within)	0.32	0.22	0.21	0.27

Note: *t*-statistics in parenthesis based on robust standard errors. \*\*, \* denote significance at 5% and 10%, respectively. Country dummies included but not reported. Only the *REGDISP* coefficients are reported for the sake of brevity; the results for the other covariates are similar to those of the benchmark specification.

Table 7 - Dependent variable: expenditure decentralisation ( $FD_{[t-t+4]}$ ) - FGLS estimation

	<i>ED1</i>	<i>ED1S</i>	<i>extED1S</i>	<i>ED2</i>	<i>ED2S</i>	<i>extED2S</i>
<i>CV<sub>t</sub></i>	-0.504*** (-3.27)	-0.243*** (-3.03)	-0.272*** (-3.38)	-0.808*** (-7.92)	-0.677*** (-9.02)	-0.260*** (-3.64)
<i>GOVSIZE<sub>t</sub></i>	0.728 (1.52)	0.687*** (2.84)	-0.050 (-0.17)	-1.176*** (-3.75)	-0.641** (-2.43)	-0.646* (1.80)
<i>GDPPC<sub>t</sub></i>	0.158 (1.35)	0.215*** (3.42)	0.149* (1.90)	-0.021 (-0.27)	0.115* (1.80)	0.111 (1.30)
<i>OPEN<sub>t</sub></i>	0.024 (0.60)	0.069*** (3.67)	0.072*** (3.89)	0.047 (1.61)	0.052** (2.02)	0.025 (0.97)
<i>POPGR<sub>t</sub></i>	0.325*** (3.14)	0.224*** (2.72)	0.094 (0.63)	0.274** (2.56)	0.310*** (3.16)	0.028 (0.26)
<i>EDUC<sub>t</sub></i>	1.916*** (3.87)	0.794** (2.40)	0.264 (0.80)	2.172*** (4.76)	1.620*** (4.78)	0.520 (1.58)
<i>LEFT<sub>t</sub></i>	-1.238* (-1.95)	0.101 (0.33)	1.041 (1.43)	0.760 (1.12)	1.454*** (2.74)	0.146 (0.21)
<i>RIGHT<sub>t</sub></i>	-2.452*** (-4.64)	-0.705* (1.95)	0.562 (0.89)	-0.144 (-0.23)	0.680 (1.39)	0.417 (0.71)
Obs.	70	70	91	70	70	91
<i>Wald chi<sup>2</sup></i>	4029.73***	21676.12***	11336.61***	8811.50***	10753.91***	5344.90***

Note: z-statistics in parenthesis based on robust standard errors. \*\*\*, \*\*, \* denote significance at 1%, 5% and 10%, respectively. Country dummies included but not reported.

Table 8 - Dependent variable: tax revenue decentralisation ( $FD_{[t-t+4]}$ ) - FGLS estimation

	<i>TD1</i>	<i>TD2</i>	<i>TD3</i>	<i>extTD</i>
<i>CV<sub>t</sub></i>	-0.278*** (-3.38)	-0.365*** (-3.59)	-0.300*** (-3.24)	-0.243*** (-4.52)
<i>GOVSIZE<sub>t</sub></i>	0.851*** (2.82)	0.204 (0.65)	0.289 (1.04)	0.610*** (3.09)
<i>GDPPC<sub>t</sub></i>	-0.059 (-0.80)	-0.038 (-0.48)	-0.032 (-0.40)	0.035 (0.88)
<i>OPEN<sub>t</sub></i>	0.024 (1.15)	0.017 (0.90)	0.037* (1.95)	0.000 (1.46)
<i>POPGR<sub>t</sub></i>	0.161 (1.62)	0.169 (1.43)	0.117 (1.01)	0.113 (1.46)
<i>EDUC<sub>t</sub></i>	1.610*** (4.36)	1.810*** (4.66)	1.786*** (5.10)	1.025*** (4.41)
<i>LEFT<sub>t</sub></i>	-0.350 (-0.53)	0.511 (0.62)	-0.512 (-0.66)	-0.039 (-0.07)
<i>RIGHT<sub>t</sub></i>	0.447 (0.68)	0.332 (0.52)	-0.474 (-0.83)	0.326 (0.67)
Obs.	86	86	86	91
<i>Wald chi<sup>2</sup></i>	13626.61***	16868.81***	16774.16***	39646.17***

Note: *t*-statistics in parenthesis based on robust standard errors. \*\*\*, \*\*, \* denote significance at 1%, 5% and 10%, respectively. Country dummies included but not reported.

## Appendix: variables, description and sources

**Regional economic disparities (REGDISP).** The population-weighted coefficient of variation of per capita regional GDP (*CV*) is used for the benchmark analysis (see Section 3 for details). For robustness purposes two other measures are also used: a Theil index - *Theil* - and the population-weighted standard deviation of per capita regional GDP - *SDLog* - (see Section 4.2 for details).

*Source:* Rodriguez-Pose and Ezcurra (2010), "Does decentralization matter for regional disparities? A cross-country analysis", *Journal of Economic Geography* 10(5), 619-644 (courtesy of the authors).

**Fiscal decentralization (FD).** The first group of (seven) indexes was built by Stegarescu (2005). The second group comes from a study by Gemmell *et al.* (2009).

\* Three tax revenue decentralization indexes (from the narrowest to the broadest measure: *TD1*, *TD2*, *TD3*), and four expenditure decentralization indexes (the broadest measure: *ED1* - *ED1S* including social security transfers; the narrowest measure *ED2* - *ED2S* including social security transfers).  
*Source:* Stegarescu, D. (2005), "Public sector decentralization: Measurement concepts and recent international trends", *Fiscal Studies* 26, 301-333 (courtesy of the author).

\* One tax revenue decentralization index (*extTD*) and two expenditure decentralization indexes (*extED1S* and *extED2S*). *Source:* Gemmell, N., Kneller, R., Sanz, I. (2009). Fiscal decentralization and economic growth in OECD countries: Matching spending with revenue decentralization. *Papeles de Trabajo* 6, Instituto de Estudios Fiscales, Madrid (courtesy of the authors).

**Government size (GOVSIZE).** Government share of real GDP per capita. *Source:* Penn World Tables.

**Education (EDUC).** Average years of total education. *Source:* Barro, R. and Lee, J.W. 2.0 07/2010.

**Population (POPGR).** Growth rates calculated from total population figures. *Source:* Penn World Tables.

**GDP (GDPPC).** Per capita GDP calculated from Purchasing Power Parity GDP (GDP growth - *GROWTH* - has been calculated from that variable). *Source:* OECD Economic Outlook no. 87.

**Openness (OPEN).** Openness of the economy in current prices, measured as total trade (sum of import and export) as a percentage of GDP. *Source:* Penn World Tables.

**Government party (LEFT/RIGHT).** Dummies that take the value 1 in each 5-years period when for most of it there has been dominance/hegemony of either left or right in the cabinet (the reference category being a balanced cabinet). *Source:* Comparative political dataset, Armingeon *et al.* (2008).