DECENTRALISATION AND REGIONAL ECONOMIC DISPARITIES

Carlos Gil Canaleta[1], Pedro Pascual Arzoz[1] Manuel Rapún Gárate[1] and Roberto Ezcurra Orayen[1]

Postal Address:

Carlos Gil

Departamento de Economía, Campus de Arrosadia

Universidad Pública de Navarra

31006 Pamplona (SPAIN)

Telephone: 00 34 948 169 346

Fax: 00 34 948 169 721

e-mail: cargil@unavarra.es, ppascual@unavarra.es, mrapun@unavarra.es

[1] Affiliation: Departamento de Economía, Universidad Pública de Navarra, Spain. The main part of this article was written when Carlos Gil was visiting the Centre for Urban and Regional Development Studies, CURDS, University of Newcastle upon Tyne (UK).

DECENTRALISATION AND REGIONAL ECONOMIC DISPARITIES

Abstract: This paper analyses the impact of both fiscal and political decentralisation on regional productivity inequalities. The study of the influence of decentralisation on economic growth has received some attention in recent years, but very few studies deal with its impact on regional inequalities. We analyse the relationship between different measures of regional inequalities in productivity, and several measures of political and fiscal decentralisation for a sample of fifteen OECD countries. In order to check for other possible influences, the analysis also includes measures of public sector size and the type of party government. The results suggest a strong negative correlation between decentralisation, mainly fiscal decentralisation, and regional inequalities.

1. Introduction

Over the last twenty years there has been an increasing interest in decentralisation all around the world. Many developing countries have embarked, or intend to embark, on some form of transfer of political power to local government (see, for example, Dillinger, 1994). Furthermore, decentralisation has become a central issue in the political agenda of developed countries with more consolidated political systems. Belgium became a federal state in 1993 (Oates, 1999). In the UK and Spain decentralisation is an ongoing process, though not without a degree of controversy. In the EU the regions are increasingly perceived to be the relevant units for implementing political decisions[1]. It is not by chance that the constant growth of regional and local participation in regional policy delivery has coincided with the rapid expansion of the EU's regional policy, and the commitment of the EU to the principle of subsidiarity.

There are numerous reasons that might explain this increasing interest in decentralisation (Armstrong and Taylor, 2000). The first of these is belief in decentralisation as an effective tool for increasing the efficiency of public expenditure. The second is reaction against large centralised bureaucracies not only in developing countries, but also in areas such as the EU. The third has to do with the influences of the changes over the last decades in the way private corporations are managed. The fourth relates to changes in the type of regional policy implemented in the EU. Policies designed to stimulate endogenous growth (through the encouragement of small firms, for example) are very difficult to run from the centre. Fifth, and last is the demand for a closer democracy which could promote public participation in social policy and administration.

Within the main line of comparative political research with an interest in the consequences of federalism and decentralisation there is agreement that decentralisation matters important when it comes to issues of policy. Some authors have claimed federalism to be superior to other democratic systems, because it provides a better safeguard for the democratic rights of citizens in general and minorities in particular (Elazar, 1995). Neo‑institutionalist economists have also made the case that certain institutional arrangements encourage individuals to engage in some economic activities more than in others, thereby giving rise to more successful economies (North, 1990). While there has been much discussion over the application and influence of decentralisation, the empirical work quantifying the economic effects of decentralisation is fairly limited, and most of it focuses on issues such as the growth of the welfare state and public expenditure. The 'hypothesis of decentralisation', proposed by Brennan and Buchanan (1980), suggests that decentralisation increases competitiveness among local governments and restrains the growth of the public sector. This hypothesis has been tested by Cameron (1978) Oates (1985), Heil (1991), Pierson (1995) and Lane and Ersson (2000) among others. Most of them have found a positive relationship between decentralisation and public sector size when the analysis includes only developed countries, but this relationship fades when a wider sample, including developing countries, is studied.

The article is structured as follows. Section 2 presents a review of the literature dealing with decentralisation, economic performance and regional inequalities. In section 3 we introduce and discuss the different measures of inequality and decentralisation used in the study. Empirical results are given in section 4. Finally, there is a brief presentation of the main conclusions.

2. Theoretical and empirical background

It is widely accepted that the three main objectives of the public sector are those initially stated by Musgrave (1959): efficiency in the allocation of resources, income redistribution and macroeconomic stability. Traditionally, most public economists have agreed that while the first of these functions can be assigned to lower levels of government, the latter two should more appropriately be assigned to the national level. Decentralisation may generate more efficiency, but may also reduce economic stability and aggravate regional inequality. Thus, in recent years these assumptions have provoked considerable controversy.

Emanating from the public choice theory, with roots in the neo-classical school of thought, there is a suggestion that decentralisation could improve efficiency in the allocation of resources by better satisfying the needs and preferences of local citizens, through better knowledge of these preferences (Oates, 1972). These gains in efficiency would be enhanced with mobility of citizens who could choose to live in the jurisdiction that best matched their preferences. Regions would also have incentives to compete with one another by attracting migrants, making more efficient use of their resources and increasing economic welfare. Tiebout (1956) argued that the ability of individuals to move among jurisdictions produces a market-like solution to the local public goods problem. The individuals vote with their feet and locate in the community that offers the bundle of public services and taxes that best suits them.

However, some authors (Prudhomme, 1995, Tanzi, 1996) think that preferences among individuals living in a country are quite similar, and that lack of co-ordination among regional governments could reduce efficiency in the provision of some public services.

The existence of regional 'spillovers' in the provision of some public goods could also generate an inadequate level of provision[2].

There are several reasons why the stabilisation function was considered inappropriate for sub-national assignment. Firstly, it could increase debt at local level if decentralisation were poorly designed (with central government covering regional and local defaults, for example). The benefits of stabilisation would spill over regional borders and result in inadequate stabilisation and excessive debt. Secondly, the increase in local debt will create inflationary pressures and pose a threat to price stability. Monetary stability requires good co-ordination between monetary and fiscal policy functions, which should be undertaken by the centre alone. Thirdly, cyclical shocks are usually national in scope (i.e. symmetrical across all regions) and therefore require a national response.

Keynesian thought supports these arguments. Decentralisation reduces the capacity of central government to use demand policies to alleviate the effects of fluctuations in production and employment. Federal and highly decentralised states would therefore perform worse. Greater centralisation also permits more efficient determination of macro-economic objectives, less diffusion in the utilisation of policy instruments, and a higher degree of co-ordination.

There are fewer empirical studies that discuss the possible relationship between economic outcomes and political and fiscal decentralisation, perhaps because this topic lies on the borderline between political science and economics. Some of them are national studies, which yielded mixed results. Zhang and Zou (1997), Freinkman and Yossifov (1999) and Lin and Liu (2000) find decentralisation to have had a positive

effect on economic growth in India, Russia and China, whereas Zhang and Zou (1998), and Xie, Zou and Davoodi (1999) have concluded the opposite for China and the USA.

A second group of studies found high correlation between fiscal and political decentralisation and GDP per capita. For example, Oates (1985) shows the average share of central government spending and revenues to be much higher for developing countries than for developed ones. Lane and Errson (2000) also find much higher average GDP per capita for federal countries, and a highly significant correlation between federalism and fiscal decentralisation. But the implications of this relationship are not clear. To repeat the question posed by Oates (1993), is fiscal decentralisation a 'cause' or a 'result' of economic development? Or is it perhaps the result of a complex interplay of a variety of forces related to development?

Recently, several authors have used international data to study the impact of different measures of decentralisation on economic performance, though with different outcomes. The results of this type of studies are probably less affected by the inverse causality problem. Davoodi and Zou (1998) find fiscal decentralisation to be associated with slower growth in both developing and developed countries. Woller and Phillips (1998) fail to find any statistically significant relationship between fiscal decentralisation and economic growth for a panel of developing countries.

However, other studies, focusing on advanced democracies, obtain a very different result. Castles (1999), in an exploratory analysis of a wide range of policy outcomes using cross-national data for 21 OECD nations, suggests that a low level of fiscal centralisation appears to have restrained post-war inflationary pressures and to have been accompanied by higher rates of post-war economic growth. His regression includes a catch-up term, as this has proved to be an essential explanatory variable in

the literature dealing with 'convergence' among countries. Lancaster and Hicks (2000) also found the impact of federalism on GDP growth to be statistically significant when neo-corporativism is simultaneously considered and a catch-up is term included. The results of Keman (2000) indicate that the socio-economic performance of decentralised countries appears to be better than that of others.

Although these studies can be criticised for the lack of variability in the samples used, it is also true that these countries share a similar socio-economic background[3], and that the definitions of the different measures of decentralisation are more comparable. This, however, is not the only reason for which they might be criticised. First of all, there are so many potential variables that might influence the different growth rates and wealth among countries, some of which (such as public sector size) could be correlated to decentralisation measures, that it is very difficult to assess whether the apparent superiority of federal systems is actually true. As Levine and Renelt (1992) have stated, there is a real danger of omitting some necessary control variables and thereby of reaching the false conclusion that a statistically significant relationship exists between growth and decentralisation. Furthermore, given our poor understanding of how decentralisation influences economic growth, there is a risk of accepting the product of spurious relationships (see Martinez-Vazquez and McNab (2001) for an example). Finally, the measurement of decentralisation also has its problems. Not only because there are different kinds of decentralisation, such as 'political decentralisation' or 'fiscal decentralisation' (related to what Keman (2000) calls 'the right to decide' and 'the right to act'), but also how to measure these different types of decentralisation.

In short, we might say that there are two opposing lines of argument linking political and fiscal decentralisation and economic performance. Emanating from the public

choice theory, with its roots in neo-classical thought, there is a suggestion that in centralised states revenue maximisation is not restrained as efficiently as in decentralised states. Decentralised states would be more efficient in economic terms, not only because the dispersion of fiscal authority would restrain overall growth of the public sector, but also because it would promote competition at regional level. The counter-argument, with its origins in Keynesian thought, argues that decentralisation limits the capacity of central government to use demand policies to reduce fluctuations in production and employment. Federal and highly decentralised states would perform worse. Greater centralisation also permits more efficient determination of macro-economic objectives, less diffusion in the utilisation of policy instruments, and a higher degree of co-ordination.

Regional inequalities and decentralisation

The second main drawback traditionally attributed to decentralisation is an unbalanced distribution of resources across regions that would generate increasing economic differences among them. There are several issues that might influence the final outcome. The first is whether or not decentralisation results in more unequal distribution of public resources. Prudhomme (1995) argues that centralised public sectors will attempt to produce a more balanced distribution by channelling resources from richer areas to poorer ones. Conversely, centralised systems may create unequal distributions of public resources by favouring politically important jurisdictions. The second issue relates to whether centralisation could lead to a higher concentration of private investment. Investors seeking closer ties with politicians and the administration might tend to choose capital regions. The third point is that decentralisation can provide sub-national officials with the power to actively pursue economic development policies.

This will not only include policies better suited to local needs or capabilities, but also several forms of competition among regional and local governments, which may include granting tax privileges and offering other forms of assistance to businesses willing to locate in a particular jurisdiction (Martinez and McNab, 2001). It is difficult to assess whether or not they will contribute to reduce regional disparities.

Both lines of argument linking political and fiscal decentralisation and economic performance could also be applied to the level of regional disparities. On the basis of the public choice theory, we might expect less regional disparity in decentralised states. In the first place, the power to control most of the public budget locally could generate more competitiveness among regions, forcing regional governments to deliver services at minimum cost, thus enhancing efficiency. Besides, local governments could be removed if they failed to achieve standards of wealth and economic growth similar to those in the rest of the country. The power to design regional policies tailored to local needs, in an effort to promote employment and productivity, would give local officials the power to achieve economic goals. Furthermore, as central government would be more reduced in size, the concentration of political and economic power around the capital region would also be less relevant.

From a Keynesian approach, however, the weaker central state would play a less crucial role in redistributing income among regions, and could not use demand side policies, such as public investment, to promote economic growth in the poorer regions. More diffusion in policies such as education or health could also lead to an increase in disparities among decentralised countries. Related to this is the fact that the benefits of regional policies spill over into other areas. For example, the creation of extra jobs in an assisted region will reduce the amount of unemployment transfers and raise tax revenue,

10

to the benefit of the inhabitants of non-assisted regions (Armstrong and Taylor, 2000). Other less tangible benefits, such as those of a social or environmental nature, could also spill over the regional boundary. Since there are effects that spread beyond regional borders, totally isolated development policies are likely to produce inefficient levels of regional policy and equalisation among regions.

An important issue in the evolution of regional inequalities in decentralised states is the existence of equalisation programs, and of course, the size of their budgets and the way they are distributed. Most developed federal states have formal equalisation programs, whilst in a large number of developing countries explicit equalisation programs still remain untried, although equalisation objectives are implicitly attempted in the general revenue sharing mechanisms used in some of them (Shah, 1998, Jun Ma, 1997). Shah (1998) also argues that intergovernmental transfers in developing countries undermine fiscal discipline and accountability while building transfer dependencies that cause the slow economic strangulation of fiscally underprivileged regions. On the other hand, properly designed intergovernmental transfers may enhance competition for the supply of public goods, fiscal harmonisation, sub-national government accountability and regional equity.

Under formal programs, there is less risk of a decentralised system generating increasing economic differences. This suggests that if there is any positive relationship between decentralisation and reduction of regional inequalities, it may be of the 'inverted U' type. If decentralisation means almost total fiscal and political independence, without equalisation programmes, there would be little chance of regional disparities in economic welfare being reduced, because there would be no compensating mechanism, and the variables that determine affluence levels would be

more likely to diverge. Underprivileged regions would be unable to compete for mobile private investment with the most prosperous ones who will be able to offer even more advantages to investors, or to properly fund policies designed to assist indigenous firms. A certain degree of co-ordination, and funding, would need to come from the central government to achieve the maximum degree of equalisation. On the other hand, a degree of decentralisation may generate more equalisation among regions, as long as there is a compensation mechanism, and local authorities are allowed to design policies better adjusted to their own developing needs.

The two opposing arguments about the impact of decentralisation on regional inequalities sheds no light on the issue that provides the focus of this study: are regional inequalities in decentralised countries greater than, smaller than, or more or less the same as in centralised countries?

We should seek the answer to this question in practical studies. There are hardly any that address this question directly, however. Tsui (1996) analyses the relation between regional inequalities and decentralisation in China. He finds fiscal decentralisation to be related to the rise in disparities in the 1980s. Again though, very special circumstances prevailed during this period of analysis, such as the great amount of foreign direct investment in the Special Economic Zones, which are to be found in the richest areas[4]. Also, the devolution process in China is an asymmetric one, with some regions having more political and fiscal autonomy than others.

3. Measures of regional inequality and decentralisation

Measures of inequality

We will use measures of regional disparities in GDP per worker (GDPpw). Other measures of affluence, such as the more commonly used GDP per capita (GDPpc), are less appropriate for this type of study, because the existence of commuters produces great distortion in some regions. Clear examples of this are Hamburg and Bremen in Germany, or the District of Columbia in the USA. Another disadvantage of GDP per capita is that it is influenced by the age structure of the population, and activity rates.

Using GDP per employed worker also presents some drawbacks. Due to different unemployment rates among countries, we might introduce a bias in the relevant measure of inequality. For example, differences in unemployment rates in Italy or Spain are much greater than in the USA. Thus, inequality in GDP per worker employed may underestimate the true level of economic inequality in some countries. On the whole, however, we feel this to be the best alternative for measuring the economic capability of a region.

Because of the methodology used in some countries (and Eurostat) to report GDPpw data, additional adjustments have been made in Austria, Belgium and Japan. In these countries GDPpw is not corrected to account for the influence of commuters to the capital region, and because of the reduced surface of the capital, the number of commuters from outside the region is indeed relevant. The inequality indices for these countries have been calculated using an aggregate region including the capital and surrounding regions.

In some countries, mainly federal states, such as Germany or the USA, the relevant level of regional aggregation is quite clear. In others, such as France or the UK, this could pose a problem. In these countries, the use of NUTS1 or NUTS2[5] levels, giving the same weight to all regions, could lead to widely differing results. We will use inequality indices weighted by employment, so that the level of aggregation does not heavily influence the results. Furthermore, the considerable differences in size among regions led us to use 'weighted' measures of inequality, as did Esteban (1994) in his analysis of regional disparities in the EU.

It is well known that compact measures of inequality might not always provide an unambiguous ranking of countries. Different indices of inequality are based on alternative ethical assessments, as was shown in the seminal articles by Atkinson (1970) and Sen (1973). By calculating alternative indices and using them in the analysis, it is possible to ensure that differences between countries are real and the results robust.

In this article we will not only use 'sigma', the standard deviation of the natural logarithms of the GDP per worker, a measure that has become widespread in the analysis of regional disparities in the convergence literature, but also alternative measures, such as the Gini, Theil and Atkinson indices. These are more common in the analysis of interpersonal income disparities, but they have been employed in the studies dealing with regional inequalities (Tsui, 1996, and Esteban, 1994).

The indices have different degrees of sensitivity with respect to transfers at different parts of income distribution[6]. All of them satisfy the Dalton transfer principle, that is, a transfer from a richer to a poorer region reduces inequality. They are also homogeneous of degree 0.

These four indices are:

1. Sigma:
$$s = \sqrt{\sum p_i \left(\ln x_i - \ln \overline{x} \right)^2}$$

2. Gini:
$$G = \frac{1}{\overline{x}} \sum_i p_i \sum_j p_j \left| x_i - x_j \right|$$

3. Theil:
$$T = p_i \sum_i \frac{x_i}{\overline{x}} \log\left(\frac{x_i}{\overline{x}} \right)$$

4. Atkinson's index
$$A(\mathring{a}) = 1 - \left[\sum_i p_i \left(\frac{x_i}{\overline{x}} \right)^{1-\mathring{a}} \right]^{\frac{1}{1-\mathring{a}}} \qquad \varepsilon > 0, \varepsilon \neq 1$$

$$A(\mathring{a}) = 1 - \exp\left[\sum_i p_i \log\left(\frac{x_i}{\overline{x}} \right) \right] \qquad \varepsilon = 1$$

In our application, x_i is GDPpw in region i, $\overline{x}$ is the national GDPpw, and p_i is the ratio of regional employment to national employment.

A low value of the parameter ε in the Atkinson indices indicates less inequality aversion (with $\varepsilon=0$, $A(0)=0$). We will present the results for three different levels of aversion: $A(1)$ has a low aversion to inequality, $A(3)$ with a medium aversion, and $A(21)$ with high inequality aversion. Table 1 shows the results of these indices for the year 1996.

[Insert table 1 around here]

The countries that show the greatest regional inequality on most of the indices are Portugal, France and the UK. A(21), however, produces quite a different ranking. On this index, Portugal continues to register the highest regional inequality, while the UK and France appear in the middle of the distribution, and Japan and Spain come second and third worst. The countries with least regional inequality are Germany and Austria,

with Finland, Canada and Italy also obtaining good scores on most of the indices. These indices suggest a relationship between federalism and regional inequalities that we will attempt to confirm in section 4.

On the whole, the ranking is quite similar on all the indices, with the exception of A(21). This is further confirmed idea by the correlation coefficients for these indices which are shown in table 2. All are very high, except those that include A(21), an index which is highly sensitive to small incomes, regardless of the size of the region. A(1) is the one with the second weakest correlation to the rest, in this case because it is less sensitive to low values of labour productivity. Obviously, correlation between A(1) and A(21) is the lowest. We can expect similar results to these when using Sigma, Theil, Gini or A(3), but they could differ substantially when using A(1) or A(21).

[Insert table 2 around here]

It is also worth mentioning that none of the indices produces significant correlation to variables such as the number of regions, the size of the country (in terms of its economy, population, or surface) or the average size of the regions.

Measures of decentralisation

Next we present a group of variables that can be used to measure decentralisation. As Martinez-Vazquez and McNab (2001) have stated, this is a problematic issue, because there is no single or best measure of decentralisation. A country may allocate an important fraction of the public budget at regional level but regions may lack sufficient autonomy to make decisions on expenditure. It is therefore important to test several alternative measures of decentralisation.

16

Nine measures of decentralisation are featured in table 3. Sources and notes to this table provide precise detail of each variable. The presentation here provided highlights some of the implications resulting from each of the different measures. Since the first five variables focus on political issues, we consider them to be indices of political decentralisation. The last four concentrate on revenues or expenses, thus we consider them to be indices of fiscal decentralisation.

The first measure, Federalism, is a dummy variable that takes the value 1 when the country has a federal constitution. Only four countries have been federations for a relevant period of time. Belgium became federal in 1993, but this is too late for it to have had any impact on regional disparities.

The next four variables (Constitutional Structure, Lijphart index, Institutional Pluralism, and Institutional Constraints) measure levels of political restraint to central government intervention, and are taken from Schmidt (1996). The Lijphart indices are standardised arithmetic means of z-transformed indicators of the federalism-unitarism dimension. The other three variables are additive indices. Some of the constraints used in the calculus are federalism, the existence of an strong second chamber, or the form of government (presidential or not).

Fiscal Difficulty measures the capacity of central government to influence economic performance. Fiscal Decentralisation measures the share of regional and local taxes in total revenue. Fiscal Centralisation measures the share of central government revenue in total revenue, excluding supranational and social security taxes, so it is not the mirror image of Fiscal Decentralisation. The reason for excluding these taxes is that central government experiences more difficulty in manipulating these revenues than other taxes under its direct control. The last variable, Financial Autonomy, measures the proportion

of local and regional government final consumption in relation to general government final consumption. This variable focuses on expenses, whilst the previous two focus on the revenue side.

[Insert table 3 around here]

4. The results

We begin our research with the analysis of correlation between the different measures of decentralisation and the alternative indices of regional inequality. As can be seen in table 4, there is a negative correlation between decentralisation and regional inequality, although in most of the cases it is not significant. Only the relationships between Financial Autonomy (% of local and regional government consumption in relation to general government consumption) and the inequality indices are highly significant. These results may indicate that federalism and decentralisation matter, but only if they lead to more decentralised expenses. In the following pages we will try to confirm this first result by introducing new variables into the analysis.

[Insert table 4 around here]

Mention has already been made of previous studies that have found a positive correlation between public sector size and centralisation (at least for developed countries). The detected relationship between regional inequalities and decentralisation may be a spurious correlation, while the significant one is the relationship between public sector size and productivity inequalities, though it is not clear why there should be a positive relationship in this direction. There are also other structural variables that could be behind this result. Countries that have been traditionally governed by left-wing parties may have been more concerned about regional disparities, and have promoted

the poorer regions either through public policies, such as direct funding or tax credits to firms willing to produce in deprived areas, or through public investment. Table 5 includes 3 variables that measure public sector size, and three others that measure the government profiles.

[Insert table 5 around here]

Table 6 shows the correlation of these variables with the inequality indices and with the decentralisation variables. Correlation coefficients between variables related to public sector size and those that measure regional inequality is lower than those previously reported between decentralisation measures and regional inequality. Furthermore, correlation between public sector size and decentralisation is also lower than might have been expected. The preliminary conclusion of this survey is that the relationship between decentralisation and regional inequality does not appear to be a spurious correlation resulting from the omission of variables controlling for the size of the public sector. We have also found high, significant correlation between two of the measures of parties in power and regional inequality. The presence of left-wing parties in government is, as expected, positive and significantly correlated with public sector size, but not with most of the measures of decentralisation.

These results support the hypothesis that both decentralisation and the presence of left-wing parties in government, probably with more active regional policies, could play an important role in reducing regional inequalities in GDP per worker employed. In the following pages we will continue the analysis of this relationship, using the multiple regression technique.

[Insert table 6 around here]

Multivariate analysis is restricted because of the small size of the sample. Neverthele ss, it is worth testing to see if the previous relationships are still valid when more than one variable is included at a time. We have regressed the different measures of regional inequality as dependent variables, and two types of independent variables. First, party government measured as the percentage of government years held by left-wing and left of left-wing parties, because its correlation with regional inequalities is much higher than the other two indices of party in government. And second, the nine variables measuring decentralisation and Public Sector Size. Table 7 shows the results of these regressions.

[Insert table 7 around here]

Results are quite encouraging. Both variables are significant when the dependent variables used are Sigma or Gini, though Left % is the most relevant. Among the variables that we have used as a proxy for decentralisation, the best result on average is obtained with Financial Autonomy. This variable, with Sigma as the independent variable, produces the highest R^2 adjusted. The best result for A(1) as independent is also when using Financial Autonomy, whereas for Gini the best results are obtained with Fiscal Difficulties and Constitutional Structure, and for A(21) with Federal. Note that for this variable, with a very high inequality aversion, the fit of the regressions is much lower than for the rest.

We have also tested the relevance of public sector size together with political parties[7]. This variable is less significant than the different measures of decentralisation, thereby suggesting that, for regional equality in productivity, the amount governments spend is not as relevant as the decision-making level at which spending and political decisions take place.

20

Although we have few degrees of freedom, and correlated explanatory variables, we have continued our study regressing the indices of inequality using independent variables taken from three categories: decentralisation, public sector size, and parties in government. We will present the results of the regression with sigma as the dependent variable, because they are very similar to those obtained for the Gini, Theil and A(3), though slightly more significant in most cases, with an implicit aversion to risk that is neither too high nor too low. We alternately introduce all the measures of decentralisation, Left % as measure of political orientation of governments, and two of the variables that measure public sector size: total size, and GFE/GDP. Results are shown in table 8.

[Insert table 8 around here]

Again, we have obtained some remarkable results. The adjustment of the regressions when using Financial Autonomy and Fiscal Decentralisation has increased substantially, which is unusually good for this kind of study, especially with Financial Autonomy and GFE as percentage of GDP. Adjustment is also quite good when using the other fiscal variables.

The measure of decentralisation is significant in most of the estimation. As in most of the previous regressions, the presence of left-wing parties in government is highly significant. The results for public sector size are not as conclusive. With Financial Autonomy and Fiscal Decentralisation GFE is also highly significant.

There is still, of course, the possibility that the previous study is omitting relevant variables. But this problem would not appear to be as important as it is in studies of comparative growth among countries. As a recent review of regional growth

performance in Europe has concluded, economic, social and political indicators are largely determined by national dimension, which is basic for understanding regional growth (Rodriguez-Pose, 1998). There is a multitude of variables that might affect differences in wealth and economic performance among countries, but it seems to us that there are fewer that might play a relevant role in explaining regional differences within countries. One possible candidate might be investment in public and human capital. There is good reason to expect some correlation between decentralisation and investment in human capital and R&D. Countries that are more decentralised are more likely to promote local higher education and research centres[8]. Of course, according to the counter-argument of Prudhomme (1995), a centralised public sector could produce a more balanced distribution of these resources[9]. Nevertheless, if such a correlation exists, be it positive or negative, it is also reasonable to expect the main direction of causality to run from decentralisation to the investment pattern.

5. Conclusion

The main conclusion that may be drawn is that decentralisation, and especially fiscal decentralisation, does indeed seem to matter when analysing regional disparities in labour productivity. The strong relationship between decentralisation and regional equality does not weaken when other explanatory variables related to public sector size and parties in government are included; quite the contrary, in fact. The composition of government is also highly significant. Left and centre-left parties seem to create the right conditions for equalising regional productivity.

The influence of public sector size is not so clear, but our result suggests a positive relationship between public sector size and regional inequalities. In the best regression, redistribution of government expenditure increases inequality. The reason for this could

be that it discourages private saving and investment in the areas where net transfers are positive.

It is also remarkable the different results that we obtain with different measures of decentralisation. The most significant, which also produces the highest adjusted R^2, is the one most closely related to fiscal decentralisation. Castles (1999), in his analysis of the link between decentralisation and economic performance in a sample similar to ours, also found evidence to support the hypothesis that it is fiscal decentralisation rather than political structure that matters. Of course, it could be that what really matters is the size of the budget in regional and local governments hands, but also that this variable is a better proxy for real decentralisation of the power to decide about spending than other measures, even those aimed at controlling for this feature.

The consequences of political and fiscal decentralisation are not merely a question of academic concern. Reduction of regional inequalities is one of the most important issues in the regional policy of the EU. If changes in the administrative level at which certain political and budgetary decisions are taken can help to reduce inequalities, it would matter, not merely in the sense that we would know more, but in the sense that we could do more.

Unfortunately, the findings here are not adequate to demonstrate the existence of such a relationship to a degree that would fully satisfy academics or policy-makers. There are several issues that cast doubts over our results. The first is whether a result that appears strong with a limited sample of countries, over one year, would hold with more countries, in a time series analysis. There could also be problems with the comparability of the data and the selection of indicators. Finally, it is still possible that other variables,

correlated with both decentralisation and regional dispersion of productivity, may influence the results.

The main conclusion of this paper is that further research is needed into the link between regional inequalities and political and fiscal decentralisation. This first step suggests that such a relationship exists. Empirical work faces the problem of the scarcity of regional data for a large number of countries, with existing databases being difficult to access. However, it would be worth the effort to build up a more complete database, in order to perform a more complex analysis. Nor is theoretical work a lesser priority. The mechanism by which decentralisation may impact regional inequalities in productivity (or any other measure of outcomes) is even less well known than that relating decentralisation and economic performance at country level. If the relationship detected here survives the scrutiny of a more detailed empirical analysis, we will need a theoretical answer to the question of how decentralisation matters. Only with this theory to give us a true understanding of the process will we be able to take political decisions to reduce regional inequalities.

NOTES

1. See, for example Tomaney and Ward (2000), and Danson, Halkier and Cameron (2000)

2. The effects of spillovers in public capital are not usually considered in studies of the impact of infrastructure on economic growth. But some authors have addressed this important issue in "network" type of public capital, such as roads, with non-conclusive results. See for example Holtz-Eakin and Schwartz (1995) and Kelejian and Robinson (1997).

3. One of the variables that may be relevant in making decentralisation effective is a low level of corruption. There is evidence that level of corruption is negatively associated with affluence (Fisman and Gratti (2000), Huther and Shah (1998)). If we do not control for this variable (as none of the mentioned studies relating economic growth and decentralization does), decentralization, also correlated with affluence, may capture part of this effect in samples including both developed and developing countries.

4. Zhao and Tong (2000) argues that the "get rich first" policy and "coastal development strategy" has contributed largely to the increase in spatial disparities.

5. Defined by the *Nomenclature of the Territorial Units for Statistics,* established by the European Communities Statistics Office. NUTS1 is the larger aggregation. In some countries, like Germany, they correspond to the different Federal States, thus they are the relevant units for analysis. In others, such as Spain, the Autonomous Communities are NUTS2, which are the relevant units. But in countries with no regional governments is not clear which is the relevant division.

6. For a detailed analysis of the properties of the various measures of inequality, see, for example, Champernowne and Cowel (1998).

7. We only show the results for total public sector size, because results for GFE/GDP are much worse, and for OPE/GDP (highly correlated to total public sector size) very similar to the ones shown.

8. A good example of the positive influence of decentralisation on the promotion of human capital and research in non-central regions may be the Spanish case. After the dictatorship, and between the late seventies and the end of the century, Spain initiated a process of decentralisation. Prior to this process, there were 23 public universities in Spain, six of which were located in Madrid and Barcelona. During the

decentralising process, 22 new public universities were created, some of them with faculties in different cities. 17 of them are located in regions previously without a public university. The total number of scholars in the new universities is now around 23% of the total, with a higher participation in technical studies (around 30%). The percentage of students is roughly the same. In our opinion, the new universities have contributed to a more equal distribution of human capital and investment. The fact that interregional mobility of Spanish students (before enrolling at universities and after obtaining their degrees) is very low supports this argument.

9. And perhaps also at the expense of efficiency in the system, because too many centres could not attain scale economies.

REFERENCES

Armstrong, H. and Taylor, J. (2000*). Regional Economics and Policy*. Oxford: Blackwell Publishers.

Atkinson, A. (1970). On the Measurement of Inequality. *Journal of Economic Theory* 3: 244-263.

Brennan, G. And Buchanan, J.M. (1980). The power to tax. Analytical foundations of a fiscal constitution. Cambridge: Cambridge University Press.

Cameron, D. (1978). The Expansion of the Public Economy: A Comparative Analysis. *American Political Science Review* 72-4: 1243-61.

Castles, F. (1999). Decentralisation and the Post-war Political Economy. *European Journal of Political Research* 36-1: 1-26.

Champernowne C. and Cowel F. (1998). *Economic inequality and income distribution*. Cambridge: Cambridge University Press.

Colomer, J. (1995). Introducción. In J.M. Colomer (ed.) *La política en Europa*, 7-25. Barcelona: Ariel.

Cukierman, A. Webb, S. and Neyapti, B. (1992). Measuring the Independence of Central Banks and Its Effect on Policy Outcomes. *The World Bank Economic Review* 6-3: 353-398.

Dillinger, W. (1994). *Decentralisation and its Implication for Urban Service Delivery*. Urban Management Programme Discussion Paper No. 16, World Bank.

Danson, M, Halkier, H. Cameron, G (2000) Regional governance, institutional change and regional development. In Danson, M, Halkier, H. Cameron (Eds) *Governance, Institutional Change and Regional Development*. Aldershot: Ashgate.

Davoodi, H. and Zou, H. (1998). Fiscal Decentralisation and Economic Growth: A Cross-Country Study. *Journal of Urban Economics* 43-2: 244-257.

Elazar, D.J. (1995) Federalism, in S.M. Lipset (ed.) *The Encyclopedia of Democracy*. London: Routledge.

Esteban, J. (1994). La desigualdad interrregional en Europa y en España: descripcion y analisis. In J. Esteban and X. Vives (eds) *Crecimiento y convergencia regional en España y Europa*. Barcelona: Instituto de Análisis Económico and Fundación de Economía Analítica.

Fisman, R. and Gratti, R. (2000). *Decentralization and Corruption: Evidence Across Countries*. Working Paper 2290, World Bank.

Heil (1991). The Search for Leviathan Revised. *Public Finance Quarterly* 19: 334-346.

Holtz-Eakin, D. and Schwartz, A.E. (1995). Spatial Productivity Spillovers from Public Infrastructure: Evidence from State Highways. *International Tax and Public Finance* 2: 459-468.

Huther, J. and Shah, A. (1998). *Applying a simple measure of good governance to the debate on fiscal decentralization*, Working Paper 1894, World Bank.

Kelejian, H. And Robinson, D. (1997). Infrastructure productivity estimation and its undelying econometric specifications: a sensitivity analysis. *Papers in Regional Science* 76(1): 115-131.

Freinkman, L. and Yossifov, P. (1999). *Decentralisation in Regional Fiscal Systems in Russia: Trends and Links to Economic Performance*. Woking Paper 2100, World Bank.

Keman H. (2000). Federalism and policy performance. A conceptual and empirical inquiry. In Ute Wachendorfer-Scmidt (ed.) *Federalism and Political Performance*, London: Routledge

Lancaster T. and Hicks A. (2000). The impact of federalism and neo-corporatism on economic performance. In Ute Wachendorfer-Scmidt (ed.) *Federalism and Political Performance*, London: Routledge.

Lane, J.E. and Ersson, S. (2000). *The New Institutional Politics. Performance and Outcomes.* London and New York: Routledge.

Levine R. and Renelt D. (1992). A Sensitivity Analysis of Cross-Country Growth Regressions. *American Economic Review* 82-4: 942-963.

Lin, J. Y. and Liu, Z. (2000). Fiscal Decentralisation and Economic Growth in China. *Economic Development and Cultural Change* 49-1: 1-22.

Lijphart, A. (1984). *Democracies*. New Haven and London: Yale University Press.

Ma, J. (1997). *Intergovernmental Fiscal Transfer: A Comparison of Nine Countries*. World Bank Working Paper 1822.

Martinez-Vazquez J. and McNab R. (2001). Fiscal Decentralisation and Economic Growth. Working Paper 01-1, Andrew Young School of Policy Studies, Georgia State University.

Musgrave, R. (1959). *The theory of Pubic Finance.* New York: McGraw-Hill.

North, D.C. (1990). *Institutions, Institutional Change, and Economic Performance.* New York: Cambridge University Press.

Oates, W.E. (1972). *Fiscal Federalism*. New York: Hascourt Brace Jovanovich.

Oates, W.E. (1985). Searching for Leviathan: an Empirical Study. *American Economic Review* 75: 748-757.

Oates, W.E. (1993). Fiscal Decentralisation and Economic Development. *National tax Journal* 2: 237-243.

Oates, W.E. (1993). Fiscal Decentralisation and Economic Development. *National tax Journal* 2: 237-243.

Oates, W.E. (1999). An Essay on Fiscal federalism. *Journal of Economic Literature* 37: 1120-1149.

Pierson, P. (1995). Fragmented Welfare States: Federal Institutions and the Development of Social Policy. *Governance* 8: 449-78.

Prudhomme, R. (1995). On the Dangers of Decentralisation. *World Bank Economic Review* 9.

Rodriguez-Pose, A. (1999). *The Dynamics of Growth in Regional Europe: Social and Political Factors*. Oxford: Oxford University Press.

Schmidt, M.G (1996). When parties matter: A review of the possibilities and limits of partisan influence on public policy. *European Journal of Political Research* 30: 155-183.

Sen, A. (1973). *On Economic Inequality.* Oxford: Oxford University Press.

Shah, A. (1998). Fiscal federalism and Macroeconomic Governance: for Better or for Worse? *World Bank Working Paper* 2005, Washington

Tanzi, V. (1996). Fiscal federalism and Decentralisation: a review of Some Efficiency and Macroeconomic Aspects, *Annual World bank Conference on Development Economics*, M. Bruno and B. Pleskovic (eds.) 295-316. Washington: World Bank.

Tiebout C.H. (1956). A pure theory of local Expenditures. *Journal of Political Economy* 64: 416-424.

Tomaney, J and Ward, N. (2000). England and the 'new regionalism'. *Regional Studies* 34-5: 471-478.

Tsui, K (1996). Economic Reform and Inter-provincial Inequalities in China. *Journal of Development Economics* 50: 353-368.

Woller, G. and Phillips, K. (1998). Fiscal Decentralisation and LDC Economic Growth: an Empirical Investigation. *Journal of Development Studies* 34(4): 139-148.

Xie, D., Zou H., and Davoodi, H. (1999). Fiscal Decentralisation and Economic Growth in the United States. *Journal of Urban Economics* 45: 228–39

Zhang, T and Zou H. (1997). *Fiscal Decentralisation, the Composition of Public Spending, and Regional Growth in India*. Development Research Group Working Paper, World Bank, Washington.

Zhang, T. and Zou, H. (1998). Fiscal Decentralisation, Public Spending, and Economic Growth in China. *Journal of Public Economics* 67-2: 221–40.

Zhao, X. and Tong, S. (2000). Unequal Economic Development in China: Spatial Disparities and Regional Policy Reconsideration, 1985-1995. *Regional Studies* 34(6): 549-561.

Table 1. Different measures of regional inequalities in GDP per worker

	Sigma		Gini		Theil		A(1)		A(3)		A(21)	
	Value	rank	Value	rank	Value	rank	Value	rank	Value	rank	Value	rank
Austria	0.0806	14	0.0739	13	0.0033	14	0.0033	15	0.0095	14	0.0455	14
Belgium	0.1310	7	0.1144	7	0.0085	7	0.0085	8	0.0253	7	0.1137	9
Germany	0.0612	15	0.0401	15	0.0020	15	0.0055	11	0.0055	15	0.0288	15
Greece	0.1061	10	0.0689	14	0.0060	9	0.0058	10	0.0165	10	0.1107	10
Finland	0.0992	12	0.0881	9	0.0046	12	0.0048	13	0.0150	12	0.0987	11
France	0.1886	2	0.1631	2	0.0199	1	0.0187	2	0.0487	2	0.1310	7
Italy	0.1011	11	0.0856	10	0.0049	11	0.0050	12	0.0154	11	0.0941	13
Netherlands	0.1087	9	0.0855	11	0.0060	9	0.0059	9	0.0176	9	0.1473	4
Portugal	0.1955	1	0.1812	1	0.0194	2	0.0191	1	0.0542	1	0.1787	1
Spain	0.1322	6	0.1161	5	0.0084	8	0.0086	7	0.0262	6	0.1488	3
Sweden	0.1428	4	0.1198	4	0.0126	4	0.0103	4	0.0295	5	0.1152	8
UK	0.1508	3	0.1153	6	0.0131	3	0.0122	3	0.0314	3	0.0962	12
Canada	0.0962	13	0.0813	12	0.0044	13	0.0045	14	0.0141	13	0.1322	6
USA	0.1310	7	0.1046	8	0.0089	6	0.0087	6	0.0252	8	0.1340	5
Japan	0.1425	5	0.1246	3	0.0097	5	0.0099	5	0.0304	4	0.1633	2

Sources: Eurostat, Statistisches Lamdesamt Waden-Wurttemberg (Germany), Canadian Statistics, Japan Statistical Yearbook 2001 (Statistics Bureau, Management and Co-ordination Agency, Government of Japan), Bureau of Economic Analysis (USA).

Table 2: Correlation coefficients of the inequality indices

	Sigma	Gini	Theil	A(1)	A(3)	A(21)
Sigma	1	0.974	0.977	0.945	0.990	0.708
Gini	0.974	1	0.942	0.914	0.977	0.710
Theil	0.977	0.942	1	0.980	0.983	0.577
A(1)	0.945	0.914	0.980	1	0.973	0.535
A(3)	0.990	0.977	0.983	0.973	1	0.676
A(21)	0.708	0.710	0.577	0.535	0.676	1
Average	0.918	0.904	0.892	0.869	0.920	0.641

Table 3. Decentralisation measures

	Federal[1]	CS[2]	Lijphart[3]	IP[4]	IC[5]	FiscDif[6]	FiscDec[7]	FiscCen[8]	FinAut[9]
Austria	1	2	-0.37	3	2	4.2	21.6	51.8	68.0
Belgium	0	1	0.19	3	3	3.3	4.8	62.2	30.5
Germany	1	4	-1.79	4	5	6.7	30.8	33.4	82.0
Greece	0	2	0.64	0	1	4.5	4.3	65.7	29.0
Finland	0	1	0.46	3	0	3.8	24.1	59.5	68.5
France	0	2	0.36	3	1	4.7	8.5	48.9	36.5
Italy	0	1	0.01	4	3	4.4	2.6	60.8	45.5
Netherlands	0	1	0.33	2	1	3.4	10	56.4	54.5
Portugal	0	0	0.61	2	1	4.3	4.4	70.1	16.5
Spain	0	1	-0.23	3	2	6.2	8.6	50.2	46.0
Sweden	0	0	-0.06	1	0	3.6	32	49.2	71.5
UK	0	2	1.4	1	1	3.4	8.8	73.9	40.5
Canada	1	4	-1.22	5	3	5.8	44.7	43.3	76.2
USA	1	7	-1.62	6	5	7.9	28.8	41	55.9
Japan	0	2	-1.11	3	2	7.3	25	46.6	79.3

Sources and notes:

[1] Federalism is coded: 0=no, 1=yes, from Castles (1999).

[2] Constitutional Structure, CS, from Schmidt (1996). This variable is an additive index where: federalism 0=no, 1=weak, 2=strong; 0=parliamentary, 1=president or collegial executive; 0=proportional representation, 1=modified proportional representation, 2=single-member districts; 0=no second chamber or second chamber with very weak powers, 1=weak bicameralism, 2=strong bicameralism; 0=no referendum or very infrequent, 1=frequent.

[3] Lijphart index: scale of federalism as developed by Lijphart (1984) and taken from Schmidt (1996). The data are standardised arithmetic means of z-transformed indicators of the federalism-unitarism dimension proposed by Lijphart (1984). Negative values indicate strong decentralisation. Negative values indicate federalism.

[4] Institutional Pluralism, IP: additive index of constitutional safeguards for sub national governance and modes of representations, based on Colomer (1995), and taken from Schmidt (1996). Composed of 4 indicators (coded 0, 1 or 2): number of effective parties, bicameralism, elected president and decentralisation. High values indicate higher barriers against national dominance.

[5] Institutional Constraints, IC: additive index of federal structures, taken from Schmidt (1996). It is an additive index that measures constraints that are due to policy harmonisation in the EU, degrees of centralisation of state structures, difficulty of amending constitutions, bicameralism, central bank autonomy and referendum. Larger values indicate decentralisation

[6] Fiscal Difficulty, FiscDif, is the reduction in central government revenue share that would be required to secure 1% of GDP increase in demand, as calculated by Castles (1999)

[7] Fiscal Decentralisation, FiscDec, is the share of regional and local taxes in total revenue. Averages from 1973, 1983 and 1992, taken from Castles (1999) and calculated form OECD Revenue Statistics

[8] Fiscal Centralisation, FiscCen, is central government revenue as a share of total revenue, averages from 1973, 1983 and 1992, taken from Castles (1999) and calculated from OECD Revenue Statistics.

[9] Financial Autonomy, FinAut, measures the proportion of local and regional government final consumption in relation to general government final consumption. Average for years 1980 and 1990. Source: OECD, *National Accounts*.

Table 4. Coefficient of correlation between the decentralisation index and regional inequality

	Political Decentralisation					Fiscal Decentralisation			
	Federal	CS	Lijphart	IP	IC	FiscDif	FiscDec	FiscCen	Fin Aut
Sigma	**-0.544**	-0.297	*0.438*	-0.265	-0.408	-0.121	-0.393	0.379	**_-0.700_**
Gini	*-0.505*	-0.356	0.384	-0.170	-0.400	-0.120	-0.350	0.340	**_-0.651_**
Theil	*-0.475*	-0.284	*0.434*	-0.294	-0.408	-0.157	-0.353	0.332	**-0.619**
A(1)	-0.415	-0.228	0.351	-0.230	-0.295	-0.066	-0.352	0.267	**-0.617**
A(3)	*-0.495*	-0.297	0.396	-0.237	-0.375	-0.095	-0.378	0.342	**_-0.684_**
A(21)	*-0.476*	-0.194	0.170	-0.068	-0.299	0.113	-0.198	0.214	**-0.571**

Bold and underlined: significant at 1%
Bold: significant at 5%
Italics: significant at 10%

Table 5. Public sector size and party orientation variables

	Public Sector Size			Party orientation		
	PSS[1]	GFE/GDP[2]	OPE/GDP[3]	Left %[4]	Left index[5]	L/R scale[6]
Austria	45.9	18.54	26.36	97.18	256.61	3
Belgium	50.5	15.36	36.65	81.77	208.27	2
Germany	43.5	18.75	24.50	77.84	198	2
Greece	37.9	13.81	27.00	100	243.28	3
Finland	33.0	20.35	12.74	73.51	194.52	3
France	46.8	18.32	28.70	35.1	111.33	2
Italy	42.9	16.29	29.04	90.52	201.06	2
Netherlands	51.6	15.31	36.67	72.07	179.12	2
Portugal	36.3	15.71	21.64	27.16	128.77	2
Spain	37.2	15.08	22.76	63.58	190.74	3
Sweden	59.8	27.63	31.76	87.21	257.29	4
UK	39.8	21.09	19.22	28.13	84.39	2
Canada	43.0	21.69	21.87	65.18	130.36	3
USA	32.5	16.80	16.77	37.78	75.56	1
Japan	28.8	9.50	16.92	0.93	2.19	2

Sources and notes:

[1] Public Sector Size: average of overall government revenue and expenditure for 1980, 1990 and 1996, % of GDP. *Source*: OECD, *National Accounts*, several years.

[2] Government Final Expenditure as % of GDP. *Source*: OECD, *National Accounts*, several years

[3] Other Public Expenditure as % of GDP. *Source*: OECD, *National Accounts*, several years.

[4] Left %: Percentage of years in power of Left and Left-Centre parties. *Source*: Schmidt (1996).

[5] Left index: additive index of orientation of party in government: 3(% left) + 2(% left-centre) + % centre. *Source*: Schmidt (1996)

[6] L/R scale: left-right scale of government. A higher number indicates governments more oriented towards the left. *Source*: Schmidt (1996)

Table 6. Correlation between public sector size, parties in government, decentralisation variables and regional inequality indices.

	PSS	GFE/GDP	OPE/GDP	Left %	Left index	L/R scale
Sigma	-0.065	-0.074	-0.032	**_-0.661_**	_-0.470_	-0.204
Gini	-0.071	-0.079	-0.051	**_-0.645_**	_-0.440_	-0.166
Theil	0.029	0.045	0.003	**-0.615**	-0.405	-0.173
A(1)	-0.038	-0.028	-0.035	**_-0.661_**	_-0.449_	-0.272
A(3)	-0.077	-0.083	-0.045	**_-0.666_**	_-0.460_	-0.220
A(21)	-0.250	-0.353	-0.076	**-0.581**	**-0.513**	-0.151
Federal	-0.055	0.199	-0.218	0.146	0.009	-0.127
CS	-0.343	-0.040	-0.380	-0.179	-0.382	_-0.481_
Lijphart	0.169	0.086	0.214	0.052	0.197	0.185
IP	-0.262	-0.065	-0.287	-0.143	-0.318	-0.450
IC	-0.186	-0.223	-0.071	0.001	-0.181	**-0.560**
FiscDif	**-0.574**	-0.355	**-0.511**	-0.406	**-0.517**	-0.360
FiscDes	0.008	_0.459_	-0.360	-0.022	-0.121	0.259
FiscCen (1)	-0.044	-0.098	0.093	-0.002	0.097	0.023
FinAut	0.264	**0.590**	-0.112	0.386	0.288	0.355
PSS	1.000	**0.564**	**_0.842_**	**0.531**	**0.589**	0.382
GFE/GDP	**0.564**	1.000	0.056	0.311	0.372	**0.518**
OPE/GDP	**_0.842_**	0.056	1.000	**0.511**	**0.529**	0.116

Bold and underlined: significant at 1%
Bold: significant at 5%
Italics: significant at 10%

Table 7. Regression analysis of regional inequality with decentralisation variables and party in government (Left %).

Dependent variable	Adjusted R^2	Decentralisation variable		Left %
A(1)	0.465	Federal	-0.0034 (0.125)	-0.0001 (0.009)
Sigma	0.582		-0.037 (0.022)	-0.0007 (0.005)
Gini	0.52		-0.331 (0.44)	-0.0007 (0.009)
A(21)	0.409		-0.0352 (0.078)	-0.0007 (0.027)
A(1)	0.488	CS, Constitutional Structure	-0.001 (0.091)	-0.001 (0.003)
Sigma	0.551		-0.0088 (0.036)	-0.0009 (0.002)
Gini	0.586		-0.0097 (0.016)	-0.0009 (0.001)
A(21)	0.334		-0.0068 (0.191)	-0.0009 (0.014)
A(1)	0.517	Lijphart	0.0021 (0.06)	-0.0001 (0.003)
Sigma	0.604		0.0193 (0.016)	-0.0009 (0.002)
Gini	0.522		0.0166 (0.043)	-0.0008 (0.004)
A(21)	0.274		0.0089 (0.397)	-0.0008 (0.024)
A(1)	0,469	IP, Institutional Pluralism	-0,001 (0.117)	-0.0001 (0.004)
Sigma	0.569		-0.0088 (0.079)	-0.0009 (0.003)
Gini	0.40		-0.0062 (0.225)	-0.0008 (0.007)
A(21)	0,254		-0.004 (0.52)	-0.0008 (0.023)
A(1)	0,445	IC, Institutional Constraints	-0.0009 (0.164)	-0.0001 (0.006)
Sigma	0,537		-0.0097 (0.045)	-0.0008 (0.003)
Gini	0,504		-0.0092 (0.055)	-0.0008 (0.005)
A(21)	0,331		-0.0077 (0.197)	-0.0008 (0.021)
A(1)	0.499	FiscDif, Fiscal Difficulties	-0.0013 (0.077)	-0.0001 (0.002)
Sigma	0.555		-0.0115 (0.034)	-0.0011 (0.001)
Gini	0.59		-0.011 (0.043)	-0.001 (0.001)
A(-20)	0.25		-0.004 (-0.581)	-0.0009 (0.027)
A(1)	0.5	FiscDec, Fiscal Decentralisation	-0.001 (0.076)	-0.0001 (0.004)
Sigma	0.537		-0.0012 (0.044)	-0.0008 (0.003)
Gini	0.473		-0.001 (0.085)	-0.0008 (0.006)
A(21)	0.279		-0.0007 (0.371)	-0.0008 (0.024)

In parenthesis: significant level.

Table 7 (cont). Regression analysis of regional inequality with decentralisation variables and party in government (Left %).

Dependent variable	Adjusted R^2	Decentralisation variable		Left %
A(1)	0.426	FiscCen, Fiscal Centralisation	0.0001 (0.213)	-0.0001 (0.007)
Sigma	0.51		0.0012 (0.66)	-0.0008 (0.004)
Gini	0.452		0.0011 (0.113)	-0.0008 (0.007)
A(21)	0.28		0.0008 (0.366)	-0.0008 (0.025)
A(1)	0.523	FinAut, Financial Autonomy	-0.0001 (0.055)	-0.0001 (0.029)
Sigma	0.614		-0.001 (0.013)	-0.0006 (0.025)
Gini	0.54		-0.0009 (0.033)	-0.0006 (0.037)
A(21)	0.392		-0.0008 (0.096)	-0.0006 (0.086)
A(1)	0.502	PSS, Public Sector Size	0.0003 (0.074)	-0.0001 (0.002)
Sigma	0.476		0.0018 (0.107)	-0.0011 (0.002)
Gini	0.438		0.0017 (0.136)	-0.001 (0.004)
A(21)	0.233		0.0004 (0.774)	-0.0008 (0.043)

In parenthesis: significant level.

Table 8. Regression analysis of Sigma with decentralisation, public sector size and party in government (Left %) variables.

Decentralisation variable		Public sector size variable		Left %	Adjusted R^2
Federal	-0.0335 (0.029)	PSS	0.0014 (0.123)	-0.001 (0.002)	0.637
	-0.0399 (0.015)	GFE/GDP	0.002 (0.228)	-0.0008 (0.003)	0.603
Lijphart	0.0175 (0.021)	PSS	0.0014 (0.123)	-0.0011 (0.001)	0.656
	0.019 (0.021)	GFE/GDP	0.001 (0.562)	-0.0009 (0.002)	0.582
CS, Constitutional Struc.	-0.0073 (0.079)	PSS	0.0012 (0.231)	-0.0011 (0.001)	0.573
	-0.0088 (0.039)	GFE/GDP	0.0014 (0.442)	-0.001 (0.002)	0.537
IP, Institutional Pluralism	-0.0073 (0.13)	PSS	0.0014 (0.175)	-0.0011 (0.002)	0.54
	-0.0087 (0.089)	GFE/GDP	0.0012 (0.517)	-0.0009 (0.002)	0.473
IC,Institutional Constrai.	-0.0083 (0.075)	PSS	0.0014 (0.172)	-0.001 (0.002)	0.576
	-0.0094 (0.067)	GFE/GDP	0.0004 (0.823)	-0.0008 (0.006)	0.497
Fiscal Difficulties	-0.0092 (0.118)	PSS	0.0009 (0.4)	-0.0011 (0.001)	0.546
	-0.0113 (0.052)	GFE/GDP	0.0003 (0.89)	-0.0011 (0.002)	0.516
Fiscal Decentralisation	-0.0012 (0.024)	PSS	0.0018 (0.051)	-0.0011 (0.001)	0.648
	-0.0018 (0.004)	GFE/GDP	0.0042 (0.025)	-0.001 (0.000)	0.689
Fiscal Centralisation	0.0013 (0.034)	Total PSS	0.0019 (0.051)	-0.0011 (0.001)	0.628
	0.0013 (0.000)	GFE/GDP	0.0017 (0.365)	-0.0009 (0.004)	0.506
Financial Autonomy	-0.0011 (0.003)	PSS	0.002 (0.016)	-0.0008 (0.002)	0.757
	-0.0016 (0.000)	GFE/GDP	0.0052 (0.001)	-0.0006 (0.001)	0.859