The impact of fiscal decentralization on social inequality: a study for the Spanish regions

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Resumen: Despite the advances developed based on fiscal decentralization, nowadays there are still major regional differences among them, which have been observed in this work through three main parameters: population, GDP per capita and occupation. These territorial disparities, among other factors, may be due to the different sectorial specialization of regional economies, geographical and natural characteristics, the differences in the human and social capital and even the role of the public sector and other political, economic or social. Under this latter premise and taking as a case study the Spanish regions, this work makes an analysis of poverty and social inequality in this region as well as the redistributive effects of income tax applied in that territory to check to what extent the role of the public sector is crucial to produce changes in the distribution of wealth.

Palabras Clave: Income redistribution, Income taxes, Participation of the State, Economic and Social Equity, Poverty and Regional Inequality

Clasificación JEL: H24, H31

1. Introduction
Traditionally, regional disparities have been widely analyzed through convergence analysis, focused in a macroeconomic reality (Rey and Janikas, 2005). Moreover, there is a growing recognition of the importance of space to many socioeconomic processes (Goodchild et al., 2000). These territorial inequalities are consequence, among other factors, to different sectorial specialization of regional economies, geographical and natural characteristics, differences in the human and even social capital (Blanchard and Katz, 1992; Krugman, 1999; Galbraith and Berner, 2001; Quigley, 2001; Bukenya and Gebremedhin, 2002; Giannetti, 2002). However, these studies do not usually consider the role of the public sector affecting these inequalities from a fiscal policy perspective (Chen and Groenewold, 2010). The central government and the regional ones has a powerful tool to change the social outlook since they can have a direct effect on the elemental variable in determining the social disparities: the distribution of personal income. Thus, along these lines, Rodríguez-Benavides and López-Herrera (2014) state that it is necessary to promote economic policies with redistributive or welfare purposes, which tend to promote economic growth differentiated by regions within the same territory. This authors also argue that it is more likely that the stability of the positive impact of increased public spending depends on its way of financing.

Conventional approaches to fiscal decentralization suggest that decentralization reduces power redistribution in a country (Prud'homme, 1995). However, recent theories argue that fiscal decentralization can function as a commitment mechanism, since a strong incentive by the regions for the continuity of transfers from the central government to the other tiers of government is generated. In other words, the poorest regions vying for an efficient public policy, so they can escape poverty through their own efforts (McKinnon, 1995; Qian and Weingast, 1997). Thus, Akai and Osio (2009) show for US that achieving autonomy for fiscal decentralization in the poorest regions of a country (low-income) contributes to the decline in ex post inequality between regions. More recently, Kyriacou et al. (2015) also observe with a sample of 23 OECD countries that the process of fiscal decentralization, accompanied by measures to improve the quality of government, would be an effective strategy to reduce regional disparities.

In any case, the results are not unambiguous, because while previous authors demonstrates the positive effect of fiscal decentralization on reducing inequalities, Song (2013) checks for the case of China that the Increase in revenue share of local governments from mid-1980s to 1994 indeed increased regional inequality, while the revenue re-centralization in 1994 only had a modest effect on reducing regional
inequality. Thus, Lessman (2011) concludes that the effect depends on the level of economic development. While rich countries benefit from decentralization with regard to a more equal regional income distribution, decentralization may lead to higher regional inequalities in developing and emerging economies. The results are pointing in the same direction for measures of fiscal and political decentralization implying that both autonomy in decision making and fiscal authority are decisive in this context. Therefore, each case must be assessed specifically since how fiscal decentralization is promoted is important for how it impacts on regional inequality. Despite this resurgence of interest in regional economic growth and inequality, the fiscal policy dimensions of the data underlying empirical results have received much less attention (Martínez-Vázquez, 2011). From this point of view, there are few empirical studies that examine the direct relationship between fiscal decentralization and regional inequality for the Spanish case from the microeconomic analysis of the degree of inequality in income distribution. This paper is a first step to empirically examine this hypothesis.

At a more micro level, what is the impact of social and economic inequality on individuals in a particular region, in terms of labor or capital income? As we know, governments can affect the distribution of income through the personal income tax. Considering the Spanish case, the adoption of the Constitution together with the creation of the state of the Autonomies and the subsequent transfer of regulatory powers to the different Autonomous Communities (hereafter, CCAA) has shown the existence of significant differences between these regional territories, even though the principle of solidarity reflected in the Constitution pursues these must be minimal. In Spain, traditionally there is an unequal distribution of economic resources, causing social inequalities. Currently, and despite the enormous effort made by public institutions in regional convergence, large regional imbalances persist between different autonomous communities (De la Fuente, 2002). In relation to the Spanish income tax, this is a shared tax between the central government and the regional ones. The regulatory powers transferred to the CCAA in this tax allow them, among other competences, to consider their own regional tax schedule in order to collect their respective shares in the total tax revenues as well as the implantation of certain regional tax credits. By 2011, all the Spanish regions has implanted their particular tax schedules.

This paper analyzes poverty and social inequality in Spain, provided through three basic parameters: population, per capita GDP and the level of employment. As a case study, we have chosen the region of Galicia (Spain), as it may be interesting to evaluate the
contrast of a relatively poor region within the context of a developed nation. Thus, it is possible to assess the role of the state in reducing social inequality through fiscal policy (and in particular, the process of fiscal decentralization), measured by the values of tax burden of taxpayers in the personal income tax, whose regulation is differentiated by regions in several aspects. The methodology is based on the study of indicators of poverty and inequality most commonly used in public finance literature in order to assess how the public sector can alter and reduce social inequalities at regional level in a country. Compared to other traditional studies, where inequalities are measured by indicators of macroeconomic convergence, this study provides an analysis of social inequality from a microeconomic perspective. To do so, we use micro-data from the Sample of Taxpayers obtained from the Spanish Institute for Fiscal Studies in 2011. The microeconomic analysis of the results allows us to assess the role of the fiscal decentralization in Spain in a more detailed way, not based as usual on aggregate macro-data neither on a representative agent but through the analysis of the distribution of income for the whole society within a particular region.

After this introduction, the structure of the paper is as follows. In section 2, we describe the Spanish personal income tax and the regulatory powers transferred to the different Autonomous Communities, as a result of the gradual process of fiscal decentralization. In section 3, we present the methodology used in order to evaluate the causal effect of the fiscal centralization by means of differentiated regional tax rates through differences in differences and then we evaluate the impact over the social inequality through poverty and inequality indicators. In section 4, we discuss the main results of the paper as well as future implications for the Spanish fiscal policy. Finally, a section of conclusion summarizes the main contributions of the paper.

2. Fiscal decentralization: the Spanish case

The foundations of modern finance in Spain are set in 1978 with the approval of the first personal income tax law, which would become a cornerstone of modern tax systems. This law tries to get the application of the principles of economic, justice, redistribution of wealth and equity in order to get that taxpayers with the same capacity, pay the same amount of taxes (Onrubia Fernandez et al, 2006).

This section describes the scope of the regulatory powers of the CCAA in the Spanish personal income tax as a great protagonist of tax collection in Spain as well as elements
whose regulation is assigned to them. Within the Spanish tax system, the personal income tax is a direct, personal and progressive one, taxing the immediate manifestation of the economic capacity of citizens, called taxable income. As it is indicated by the Spanish Tax Agency, the taxable income of each person is indicative of the degree of well-being and, therefore, to determine what must be the contribution of each taxpayers to sustain government expenditure.

With the approval of the regional financing system, the regional governments have regulatory powers in relation to the taxes transferred, as in the case of Spanish income tax, as a result of a long process of negotiation between the State, the CCAA and Cities with statutes of autonomy (Ceuta and Melilla) and the Council of Fiscal and Financial Policy. This new situation reflects significant progress in the degree of fiscal decentralization, promoting responsibility and autonomy of CCAA, increasing the weight of tax revenues on total financing thereof, expanding regulatory powers and legal ability to modify the level or distribution of tax revenues as well as collaborating on the participation of tax management tasks. Specifically, from January 1, 2009, the partial transfer in the percentage of personal income tax collection rises from 33% to 50%.

In addition to raising rates on regional income tax collection mentioned above, the increase in the legislative powers of the CCAA on that tax, albeit with some limitations, it is contemplated (Martínez Giménez et al., 2014). These skills are basically three, the first two existing and third-ups: (a) the possibility of changing the tax rates through the adoption of a progressive regional scale, applicable to the general tax base (general taxable income) (b) apply tax credits in the regional total tax liability and (c) the possibility of fixing the amount of the personal and family allowances applicable for the calculation of the regional tax.

According to the first measure, the regulatory powers transferred to the CCAA in this tax allow CCAA, among other competences, to consider their own regional tax schedule in order to collect their respective shares in the total tax revenues as well as the implantation of certain regional tax credits.

By 2008, only three regions has implemented their particular tax schedules: Madrid, La Rioja and Comunitat Valenciana (Castilla León has implanted their regulatory power but this region decided to maintain its tax schedule). Then, by 2009, apart from these regions, Murcia joins the regions with the establishment of its own regional tax schedule. For this reason, in the next section we analyze the causal effect of this fiscal
decentralization measure by comparing the difference between this region (Murcia) and another one similar in terms of population, proximity and economic structure (Málaga). (pending of including the regional tax schedule in each case).

3. Methodology

We analyze the causal effect of the implementation of particular progressive schedules in Spain through differences in differences (hereafter, diff in diff). To do so, we use the tax micro-data gathered from the taxpayers statements of the personal income tax provided by the sample of respondents from the Institute for Fiscal Studies (IEF-AEAT) for 2008 and 2009. The regional perspective is considered taking into account as a case study these Spanish regions, Murcia and Málaga (the selected regions), and observing to what extent the role of the public sector can produce changes in the distribution of wealth.

We define treatment indicator, Di, as a binary variable for any individual i who is part of the autonomous communities that have implemented their own progressive tax schedule:

\[ D_1 = \text{if individual } i \text{ belongs to one of the CCAA with particular schedule} \]
\[ D_0 = \text{if individual } i \text{ does not belong to one of the CCAA with particular schedule} \]

Moreover, the variable of analysis is tax liabilities (TL) paid by the taxpayer i

\[ TL_0i = \text{if individual } i \text{ belongs to the CCAA with particular schedule (in our case, Murcia)} \]
\[ TL_1i = \text{if individual } i \text{ do not belong to the CCAA with particular schedule (in our case, Málaga)} \]

The calculation of the value of diff in diff estimator is obtained from the following expression (Ashenfelter and Card, 1985; Abadie, 2005)

\[ TL = \mu + \lambda D + \omega T + \alpha(D*T) + \beta Y + \varepsilon \quad (1) \]

where:

\( TL \) = regional tax liabilities
T= explanatory binary variable which indicates the time when the individual is observed (T = 0, before the implementation of a particular regional tax schedule and T = 1, after)  
Y=control variable defined as the income (tax base before the implementation of the regional tax schedule)  
$\lambda$, $\omega$ and $\beta$ = parameters associated with the explanatory variables D, T and Y, respectively  
$\mu$= parameter showing the fixed effects in the model  
$\varepsilon$ = random error, zero mean: $E [\varepsilon|D,T]=0$  
$\alpha$ = parameter that determines the set of variable D * T (interaction of both variables) effect. It corresponds to the difference in difference estimator.  

After evaluating this causal effect generated by fiscal decentralization in Spain, we introduce a poverty and inequality analysis measured in the two years considered to compare the changes suffered by this fiscal measure. The effect of the fiscal centralization over the social inequality is observed through two types of indicators: the poverty indicators and the inequality indicators (pending of results).  

Poverty analysis  

Poverty is a phenomenon that decreases the level of welfare of the society and adversely affects economic development (Garcia Diaz, 2008). The European Council classifies as poor population those individuals, families or groups whose resources (material, cultural and social) are so limited that they are excluded from the minimum subsistence of the member state in which they live. In particular, it establishes the limit at 60% of median individual income of a given population (EUROSTAT, 2000).  

The definition of poverty has multiple classifications. However, at present there are two basic approaches: absolute poverty and relative poverty. Absolute poverty is related to the lives of individuals and the degree of satisfaction of a number of needs such as food or housing. Relative poverty, meanwhile, is based on the ability of people to access certain resources or living standards prevailing in the society, being conditioned by disposable income or expenditures. Both types of indicators have limitations necessitating the use of a more complete analysis.  

In recent decades, European poverty studies are generally based on the concept of relative poverty since it is considered that poverty in an absolute sense is virtually eradicated in developed countries. Within this approach, there are in turn two ways of
measuring poverty: as monetary poverty and as material deprivation. In the first case, poverty is understood as the lack of monetary resources and its result is the lack of access to goods, services and certain living conditions. In this case, the measurement would be made directly through income or wealth, and indirectly assessing the access to goods and services. In the second case, poverty and the lack of certain goods and services is defined, measuring as a proxy of available resources (monetary ones) facilitating access to such goods. For our case study, we will use the approach to monetary relative poverty.

In practice, there is a need to set a limit beyond which states that a person has not met their basic needs. In the case of relative monetary poverty, the variable that is handled is the income level of the individuals. Thus, it is considered poor to anyone with an equivalent income below the poverty line. This threshold, in turn, sets what is called a poverty line which divides people into two groups: the poor and the non-poor. In our case, we perform two analysis, considering two different thresholds:

(A) the poverty line, $z$, fixed income corresponding to 60% of the median income of the sample, following the definition of the European Commission

(B) the poverty line, $z_s$ under the most commonly used measure for the study of severe poverty, i.e., fixing this threshold at 25% of average income.

Below, we present some of the poverty indicators commonly used in this type of analysis. Most of the measures can only be used when the poverty line is set according to income since many of them incorporate information about the differences between the threshold and the income of the poor population. A comprehensive study of poverty requires taking into account three fundamental aspects of the phenomenon: incidence, intensity and inequality among the poor individuals. In our case, we define the indicators that consider the incidence and intensity of poverty, leaving the inequality analysis to the next section.

a) Headcount ratio ($H$)

The measure or indicator of poverty most widely used in the academic literature is the headcount ratio. It is a measure of the incidence of poverty measuring the proportion of the population that is considered poor. His expression is as follows:

$$H = \frac{q}{N}$$

(1)

where $q$ represents the number of poor in the population and $N$ the total population.
In measuring the intensity of poverty, there are several indicators. The most widely used are:

b) Poverty gap (BP)

The poverty gap indicates the average deficit of the total population within the line of poverty, taking into account the entire population. In order to get that a poor individual with a level of income \( x_i \) be out of poverty, we should give him the extra income that is missing, \( z - x_i \), to at least reach the threshold. In other words, if we want to end poverty, we would have to collect total income required for all poor individuals achieved the threshold, \( z \). Therefore, the gap is built by the accumulation of the poverty gaps of the poor individuals.

\[
BP = \sum_{i=1}^{q} (z - x_i)
\]  

(2)

where \( z \) is the poverty line and \( x_i \) is the income of the poor population occupying the position \( i \) once ordered upstream all individuals according to their income level.

c) Income gap ratio (I)

This measure downplays the poverty gap dividing it by the minimum income would get the poor to escape poverty, i.e., \( q \times z \). This indicator assesses the degree of poverty on nominal poverty line and corresponds to the mean deviation to it for people who are under it.

\[
I = \frac{BP}{q \times z} = 1 - \frac{u_q}{z}
\]  

(3)

where \( BP \) is the poverty gap and \( u_q \) is the average income of the poor individuals.

d) Poverty gap ratio (or relative poverty gap, HI)

If instead of dividing the poverty gap between the amount \( q \times z \), we divided it by \( n \times z \), considering the whole population considered, this measure can be express the product of the poverty rate by the relative income gap. This indicator incorporates information from both incidence and intensity of poverty.
where \( H \) is the poverty rate and \( I \) is the relative income gap.

In order to introduce the subsequent analysis of inequality, we will introduce a measure that reflects the degree of inequality of the poor individuals.

e) Foster-Greer-Thorbecke index (FGT)

This index measures gaps in private consumption, with reference to the individual line of poverty and weighted by \( \alpha \), which quantifies the degree of inequality of the population in poverty situation. Since \( \alpha \) is an undetermined value, it can take different values.

\[
FGT = \frac{1}{N} \sum_{i=1}^{N} \left( \frac{z - renta}{z} \right)^{\alpha}
\]  

Finally, the TIP curves together reflect the three fundamental aspects of poverty previously mentioned: the incidence of poverty, where the percentile in which the curve becomes horizontal matches the existing proportion of poor in the population; the intensity of poverty, since their maximum height reached is the total sum of the gaps of poverty per capita; and inequality, reflected by the degree of curvature or concavity. The slope at each point represent the poverty gap, associated with the corresponding percentile. As to its usefulness, these curves allow to identify specific empirical situations where it is possible to consistently ensure a distribution, or sample population, has more poverty than another.

Inequality Analysis

Inequality is a broader concept than poverty as it is defined in a conception of the entire distribution that does not focus solely on the distribution of wealth or income. Even so, both analysis are closely related. The Human Development Report 2011 shows that environmental degradation and inequalities pose a serious threat to the progress of human development (UNDP, 2011).

Inequality can be defined as the distance between the members of a society by unequal distribution of opportunities and resources within a homogeneous society. The existence of regional disparities in Spain is a question widely studied by economic science for decades. In this sense, the role of government is essential to achieve the goal of an improvement in the redistribution of income after tax, that is, a more progressive and
equitable tax to reduce social inequities revenues and drive the economic indicators to
improve the welfare of society as a whole (Theil, 1989).

The most common way to quantify the levels of income inequality indicator is the ratio
of concentration called Gini index (GI), which takes values between 0 (when there is
complete equality in income distribution, i.e., all individuals present identical value
equal to the mean) and 1 (complete inequality, in the case that just one individual
accumulates all strictly positive value of the distribution). Geometrically, this measure
is related to the Lorenz curve, showing the cumulative percentage of income possessed
by individuals or households, arranged in ascending according to their income level
(Lizarraga Mollinedo, 2013).

\[
IG = \left[1 - \sum_{i=1}^{n} (P_i + P_{i-1}) (Y_i - Y_{i-1})\right]
\]

(6)

where \(P_i\) is the population stratum \(i\); \(P_{i-1}\) represents the rest of the population; \(Y_i\) is the
income stratum of population \(i\) and \(Y_{i-1}\) is the aggregate income.

Thus, the closer to the bisector of the curve, the better will be distributed the income
where the bisector is the most equal distribution possible, in which all citizens of a
population would have exactly the same income. Likewise, the larger the area between
the bisector and the curve, the greater the inequality.

The redistributive effect is measured by the Reynolds-Smolensky index (1997). This
index compares the change in inequality, as measured by the Gini index, which is
produced by applying the tax and is defined as follows:

\[
\Pi^{RS} = 2\int_{0}^{1} (X_{x-t}(p) - X_{x}(p)) dp = IG_{x} - IG_{x-t}
\]

(7)

Values above zero represent a redistributive tax behavior, the higher, the higher the
accumulated redistributive positive value, while values below zero represent a tax anti-
redistributive behavior. The zero value is identified with the neutral behavior
redistribution, a result of the strict proportionality assessment.

As regards the measure of overall progressivity, we highlight Kakwani index (1997)
defined as:

\[
\Pi^{K} = 2\int_{0}^{1} (X_{x}(p) - T_{x}(p)) dp = C_{T} - IG_{x}
\]

(8)
It is a measure of separation of inequality in the distribution of the resulting tax liabilities when it is compared with taxable income inequality. Therefore, positive values show progressive tax, while negative values indicate a regressive tax. The value zero is identified with a proportional tax.

4. Results and Discussion

According to the results between taxpayers in Murcia (treatment group) and Málaga (control groups), we get the following results for the case of fiscal decentralization by means of regional tax schedule (Table 1).

On one hand, on average taxpayers in Murcia achieve 661.11 € more than the ones in Málaga in 2008 (pre-treatment period). Therefore, the two groups are not equal before the implementation of the fiscal measure considered. On the other hand, we see that on average individuals in both regions pay 419.91 € less taxes in 2009 compared to 2008, maybe because of the lower tax collection during the crisis.

We finally found that the interaction term between treatment and the time indicator is negative. Hence, taxpayers who live in Murcia have a lower tax burden (-164,94 €) than the ones in Málaga although the difference is smaller than the “time effect. But nevertheless the difference and difference approach indicate a negative value. Therefore, the diff in diff estimator shows significance differences choosing different regional tax schedules.

Table 1. Calculation of the estimator Diff in Diff

<table>
<thead>
<tr>
<th>Dependent Variable: TL</th>
<th>(1) Diff in Diff</th>
<th>(2) Diff in Diff (control variable)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Constant</strong></td>
<td>3216.794***</td>
<td>3159.684***</td>
</tr>
<tr>
<td></td>
<td>(42.14255)</td>
<td>(38.31869)</td>
</tr>
<tr>
<td><strong>D</strong></td>
<td>689.6192***</td>
<td>661.11***</td>
</tr>
<tr>
<td></td>
<td>(58.66662)</td>
<td>(53.34)</td>
</tr>
<tr>
<td><strong>T</strong></td>
<td>-457.7245***</td>
<td>-419.9196***</td>
</tr>
<tr>
<td></td>
<td>(59.32011)</td>
<td>(53.93574)</td>
</tr>
</tbody>
</table>
5. Conclusions

This paper analyzes the decentralization process of the Spanish personal income tax since its introduction until today, highlighting the major reforms undertaken and the several measures which led progressively to the partial transfer of this tax to the CCAA. Despite the advances developed based on fiscal decentralization, nowadays there are still major regional differences between them. In this sense, the role of fiscal policies on the redistributive function is a key element in order to reduce these imbalances. Taxes and, in particular, the Spanish personal income tax can be regulated in this regard in order to avoid regional inequalities among territories from a microeconomic perspective.

This paper evaluates the causal effect of the fiscal centralization in Spain by means of differentiated regional tax rates through differences in differences by comparing two similar regions (Murcia and Málaga): one with its own regional tax schedule and the other one with the common tax schedule used by the rest of the regions. To do so, we use the tax micro-data gathered from the taxpayers statements of the personal income tax provided by the sample of respondents from the Institute for Fiscal Studies (IEF-AEAT) for 2008 and 2009, year when Murcia established its own tax schedule. The diff in diff estimator shows the existence of significance differences choosing different regional tax schedules in Spain.
On the other hand, this paper also pursue an analysis of poverty and inequality from the distribution of existing income for one of the above Spanish regions. The regional perspective is considered taking into account as a case study the aforementioned Spanish regions and observing to what extent the role of the public sector can produce changes in the distribution of wealth (pending of results).

References


