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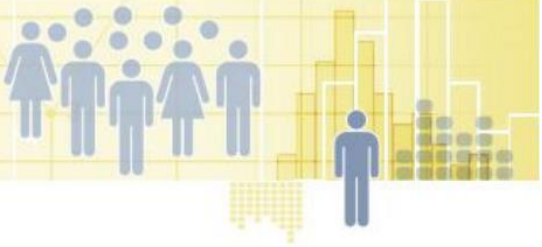

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Luis Ayala

Ana Herrero

Jorge Martínez-Vázquez

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Luis Ayala[*]
(*Universidad Rey Juan Carlos*)
Ana Herrero[**]
(*Universidad Nacional de Educación a Distancia*)
Jorge Martínez-Vázquez[***]
(*Georgia State University*)

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* Facultad de Ciencias Jurídicas y Sociales, Universidad Rey Juan Carlos, Paseo de los Artilleros s/n, 28032 Madrid, Spain. Email: luis.ayala@urjc.es

**Facultad de Derecho, UNED, C/ Obispo Trejo, 28040 Madrid, Spain. Email: aherrero@cee.uned.es

*** Economics Department, Andrew Young School of Policy Studies, Georgia State University, 14 Marietta Street, Atlanta, Georgia 30303-3083, US. Email: jorgemartinez@gsu.edu

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Abstract

This paper analyzes the determinants of welfare benefit levels within a highly fiscally decentralized context. More specifically, we analyze the role of yardstick competition as a driver of the institutional design of subnational government policies in the absence of federal co-ordination and financing. Empirically we focus on the welfare benefit programs of Spanish regional governments during the period 1996-2015. Our results strongly support the significant role played by yardstick competition: regional public agents observe what their peers are doing and act accordingly. Moreover, we find evidence of vertical externalities: even in a completely decentralized framework regions consider the benefits set by the central government as a benchmark when determining their own welfare benefit levels.

Keywords: welfare, fiscal federalism, yardstick competition, inequality

JEL: H73, I38

1. INTRODUCTION[1]

The benefits of fiscal devolution have been extensively highlighted in the economic literature. A decentralized provision of public services is supposed to foster citizens´ wellbeing, since it allows territories to adjust their own policies to the particular needs and preferences of their residents. For a long time, the same literature has suggested that decentralization also boosts public policies innovation, if only because of the larger number of agents involved in the process.[2] One implication of fiscal federalism working as a public policy laboratory is that incumbents are expected not only to innovate but also make their decisions taking into account what their neighbors are currently doing. This could be due to several reasons. First, because when imitation takes place, finding best practices becomes cheaper. Second, because incumbent officials could imitate each other in order to signal their respective constituencies their abilities when managing public resources in a process that has become known as "yardstick competition" (Besley and Case 1995).

One of the areas where yardstick competition could have special relevance is that of the determination of welfare benefit levels. The potential interactions among subnational governments when setting their welfare benefit levels raise numerous interesting questions and have been a major focus of policy research. An extensive literature on welfare inequalities across jurisdictions has revolved around regions' strategic behavior and the possible responses of subnational governments to changes in welfare policies in neighboring jurisdictions (Schroder, 1995; Berry et al., 2003; Baicker, 2005a; Fiva and Rattsø, 2006; and Dahlberg and Edmark, 2008). Another large literature has focused on the price and income effects of federal grants in terms of differences of benefits across jurisdictions (Ribar and Wilhelm, 1999; Baicker, 2005b; Chernick, 1998, 2000; Marton and Wildasin, 2007; and Toolsema and Allers, 2014).

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[2] For example, Kotsogiannis and Schwager (2006) show in a theoretical model that federations generate larger incentives to innovate than unitary systems.

Most of these studies have examined the possible effect of yardstick competition in welfare programs in contexts where there are federal funds to match jurisdictions' expenditures in federal schemes based on block grants. Far less research has examined the extent to which yardstick competition may have a role in welfare systems where there is neither federal funding nor federal coordination.

A different literature has studied the vertical interaction among different levels of government (federal and regional), which can affect the political process determining the decisions made in each region (Keen, 1998; Esteller-Moré and Solé-Ollé, 2001). In the case of welfare benefits, there is not a complete picture in the literature of these possible interactions. One question is whether in completely decentralized welfare schemes, regions might still consider the benefits set by the central government as a benchmark when determining their own welfare benefit levels.

The purpose of this paper is to analyze the determinants of welfare benefit levels within a completely decentralized context. More specifically, we will be analyzing the role of yardstick competition as a driver of the institutional design of those subnational government policies in a context where there is neither federal policy co-ordination nor financing (completely decentralized systems). The basic question we want to analyze is whether the effects between neighbouring jurisdictions that occur when there is a common funding system also are present when there is complete decentralization. This is an issue for which heretofore the evidence has been scarce. In addition, we research the extent to which regions in completely decentralized systems use the benefit levels set by the central government in their territories as a benchmark when determining their own regional welfare benefit levels.

Empirically, we focus on the welfare benefit programs of Spanish regional governments (Autonomous Communities, ACs hereafter) during the period 1996-2015. The Spanish case provides a novel opportunity to research the role of yardstick competition in shaping welfare benefit policies in highly fiscally decentralized systems. In Spain, these programs were entirely created and regulated by the ACs themselves without any participation of the central government in their design, regulation or financing.

Because of the clean slate, and therefore lack of historical inertia, the role of self-innovation and imitation across ACs should be expected to be much stronger. Interestingly, and in contrast, most of the remaining regional social expenditure policies in Spain actually derive from largely devolved responsibilities and for which the central government still plays coordinating and financing roles. When analyzing these other social service policies, we find that the pre-devolution level of provision generated a strong inertia in the actual evolution of the ACs' budgets once they were in charge. However, unlike all those other devolved powers, welfare benefit spending is not financed with any specific transfer coming from the central government, but with regional governments´ general resources. In summary, the analysis of the determination of welfare benefits at the Spanish regional level provides a novel unique opportunity to test the yardstick competition hypothesis within the context of what could be considered an "extreme model of decentralization".

To test that hypothesis, we first implement a two-stage-least-squares model that addresses the potential endogeneity problem of some of our covariates. Secondly, in order to tackle the inertia that usually affects budgetary variables, we run several dynamic (system-GMM and Panel Corrected Standard Errors) models. Our empirical results lend strong support to the yardstick competition hypothesis: regional public agents observe what their peers are doing and act accordingly. The main contribution of the paper, therefore, is that the hypothesis of yardstick competition in welfare benefits is fulfilled not only in frameworks where there is federal coordination but also in contexts of complete decentralization of these policies. We also find that regions use the social security benefits set by the central government in their own territory as a benchmark when determining their own welfare benefit levels. This shows the presence of vertical externalities in a context of complete decentralization.

The rest of the paper is structured as follows. In section 2 we provide a brief explanation of the institutions surrounding Spanish regional welfare benefits. Section 3 revisits the previous relevant literature on yardstick competition and advances a simple theoretical framework to guide our empirical analysis. In section 4, we present our empirical approach. In section 5 we discuss the results. Section 6 concludes.

2. SPANISH REGIONAL WELFARE BENEFITS PROGRAMS: THE INSTITUTIONAL FRAMEWORK

The Spanish system of welfare benefits is somewhat singular in a comparative framework. Despite the remarkable advances of the Spanish welfare state since the mid-1970s, access to social assistance for the needy population remains a weak area. The current system is the sum of widely different benefit systems, which were conceived at different points of time according to very different logics. The result is a flawed mosaic of benefits, showing high levels of horizontal inequity and quite heterogeneous levels of protection for individuals or households with otherwise similar needs.

Welfare protection in Spain includes economic benefits that are managed by different institutions and are designed to protect different contingencies. Regarding unemployment benefits, those provided by the central government include non-contributory unemployment benefits and those destined to give protection in situations of permanent or temporary inability to work. The former protect people who have exhausted their unemployment benefit or have not contributed enough to be entitled to this level of protection. In the same way, the system also acknowledges other non-contributory benefits destined to protect individuals who are unable to work, such as the non-contributory maternity allowance, and the non-contributory Social Security retirement and disability pensions. The last resort of the safety net consists of the Minimum Income programs of each one of the regional governments (Autonomous Communities). Potential claimants can apply for these benefits only if they have used up entitlement to the other benefit programs.

These regional welfare schemes have had an increasing importance in regional budgets since their creation in the late eighties, with their beneficiaries growing in numbers even during the expansive phase of the economic cycle prior to the 2008 crisis. The number of beneficiaries currently amounts approximately 500.000 people (1.7% of the total population), with an increasing trend–although showing strong diversity across ACs.

Together with their quantitative importance, these programs have a policy design appeal for one important reason. Their fully decentralized design allows a close analysis of the advantages and disadvantages of extreme or radical fiscal federalism models of social

assistance. As previously mentioned, regional governments in Spain created and regulated their welfare benefits completely *ex novo*, without reference to any pre-existing structure at the central level. Therefore, without central master lines, each territory was completely free to decide the potential beneficiaries, the benefit levels, the temporal limits, and all other aspects of the programs. As a result, when analyzing the institutional design, we observe highly diverse levels of protection, even larger than the ones observed in truly federal countries.[3]

From the start, regional social assistance programs have been handicapped by serious problems due to the total lack of coordination and financing from the central government. These shortcomings, even perhaps more than the naturally expected regional differences in preferences and priorities, would appear to be the main drivers behind the flawed mosaic of highly varied schemes, with striking differences in regulations and results, and, above all, large differences across regions in benefit levels.

But, what are the true drivers of that diversity? There is still little empirical evidence on the potential roles played by regional needs (poverty levels), preferences (sensitivity to distributional issues/ideology), and regional financial capabilities.[4] However, casual evidence would seem to suggest that the especially favorable financing system that accrues the so-called "foral" (charter) regions is the main reason for the large differences between their welfare benefits and those provided in the rest of the country—the "common regime" regions.[5]

The variety of results and the limited economic sufficiency of the Spanish regional welfare schemes become more obvious when one considers the adequacy ratios used by other European Union countries -expressed as the ratio between benefit levels and the

[3] Even though heavily decentralized, formally, Spain is a unitary country.

[4] While the first two cases would be a positive outcome of decentralization, the last one would be an undesirable effect of a badly designed regional financing system (Prud´homme, 1994; Buchanan, 1965).

[5] The regional governments of the Basque Country and Navarre enjoy a privileged financing system by which they are allowed to collect on their own basically all taxes within their respective territories. As a compensation for the services provided by the central government, both regions implement a bottom-up transfer, the calculation of which historically has resulted in a very generous advantageous financial system for these two regions. In contrast, the so-called "common-system regions" only accrue revenues from some own taxes, revenue sharing in some central taxes, and top-down transfers from the central government.

poverty thresholds.[6] Whereas in countries like Denmark the benefits practically cover the total risk of poverty and the indicators of Anglo-Saxon countries are not far off the 75 percent mark, the majority of Central European countries offer adequacy levels between 50 and 70 percent of the poverty line. Nevertheless, all of them are higher than the average of the Spanish ACs, which was below 44% in 2015. However, this average value hides a great diversity of results. While some regions provide medium-low benefit levels (Aragón, Asturias, the Balearic Islands, and Castile and León) and others are even in the top part (the Basque Country and Navarre), most regions show low or very low adequacy indicators vis-à-vis within the European practice. Those differences underline the pronounced heterogeneity within Regional Minimum Income schemes, with a marked difference between benefit levels.

Figure 1 illustrates how much the level of benefits drastically differs across Spanish regional programs. These differences widen considerably as the size of the household receiving the benefits increases. While regions such as the Basque Country or Navarre pay benefits close to 1,000 Euros to larger households, in a quarter of the regions the level of benefits is below 500 Euros. Even though ACs with greater spending capacity tend to offer higher than average benefits, that is not always the case. For example, one of the richest regions, Madrid, offers comparatively low levels of benefits.

3. LITERATURE REVIEW AND THEORETICAL FRAMEWORK

3.1. Literature review

Diversity is the expected result of fiscal federalism models. Each territory has the power to decide –at least to a certain extent– how much public services to provide, how much taxes to collect, and the distributional pattern of both services and taxes. Within a correct institutional design, this generates welfare gains, since the regional fiscal supply will better satisfy citizens´ preferences and needs versus the assumed central uniform model of provision (Oates, 1972). However, as we have already previously remarked, it is not always possible to affirm that the current diversity of regional expenditure is a direct

[6] We measure adequacy ratios comparing benefit levels (MISSOC Comparative Tables Database, 2015) and poverty lines (EU-SILC, European Union Statistics on Income and Living Conditions, 2016). We use the EU-SILC files of 2016 because income data in this survey refers to the preceding year.

result of differences in territorial preferences and needs, but rather it may be the result of the asymmetric distribution of economic activity and territorial fiscal capacity (Buchanan, 1950). The main reason for the existence of equalization systems is to provide the means to (partially) close the financing gaps ability, not only for equity reasons but also to avoid inefficient forms of migration.

The literature on the determinants of sub-central spending is large. From the perspective of public services demand, evidence on the impact of demographic, ethnic and religious characteristics of territories can be found in Castles (1989), Cutler et al. (1993), Di Mateo and Di Mateo (1998), Costa-Font and Rico (2007), Sanz and Velázquez (2007), Cantarero and Lago (2012), and Magazzino and Melle (2012). For example, higher shares of population over 65 or under 16 tend to increase health care or education expenditure needs. More evidence on the impact of demographics, testing the intergenerational competition hypothesis, can be found in Falch and Rattsø (1997), Fernández and Rogerson (1997), Poterba (1997) and Busemeyer (2007). Groups with a higher representation or share in the total population tend to restrict the growth of those services from which they benefit less. Also from the perspective of public services demand, Wagner´s Law has been extensively tested. The evidence in this case is mixed, but it appears that those analyses implemented at the regional level rule out the possibility of public services behaving as luxury goods (Di Mateo and Di Mateo, 1998; Falch and Rattsø, 1999; López-Casasnovas and Sáez, 2006; Busemeyer, 2006; Costa-Font, 2010; Herrero and Tránchez, 2016). Finally, the location and settlement of population can affect the territorial distribution of facilities and human resources. Population density and congestion can affect the ways and costs with which public services can be provided. Most of the evidence on this topic points to the existence of economies of scale in the provision of public services up to some degree (Poterba, 1997; Nguyen, Häkkinen and Pekurinen, 2009; Martínez-Vázquez *et al*., 2017).

The supply of public services is also conditioned by an array of factors. First, the ideology of regional governments can affect the territorial distribution of spending. Left-wing administrations tend to spend more, according to Castles (1989), Falch and Rattsø (1999), Snyder and Yackolev (2000), Costa-Font and Pons-Novell (2007), and Herrero and Tránchez (2016). Second, institutional elements such as government fragmentation, political alignment or the level of decentralization can either increase or reduce the level

of spending (Falch and Rattsø, 1999; Painter and Bae, 2001; Pons-Novel, 2007; López-Casasnovas et al. 2005; Costa-Font, 2010).

As we have remarked above, another critical element that affects the supply of public services is the level of sub-central financial resources. Beblavý (2010), Cantarero and Lago (2012) and Herrero and Tránchez (2016) find strong evidence, not surprisingly, on the impact of regional financial resources in the distribution of sub-central public spending.

However, it is important to highlight that most of the literature cited above ignores the territorial interdependency of policy decisions. Nevertheless, there is a significant separate literature studying how governments tend to observe what their neighbors do, and act accordingly for different reasons. First, public policies of one region can affect citizens living in other territories due to service spillovers (Case and Rosen, 1993). Second, governments can implement fiscal competition in order to attract resources residing in other jurisdictions (Solé-Ollé, 2003; Allers and Elhorst, 2005; Besley and Case, 1995; Bordignon et al, 2003; Johnson, 2014). And third, territorial interdependency can be due to so-called yardstick competition: sub-central governments imitate each other to signal citizens the bias and intensity of their policies, assuming that they will decide their vote by relative comparisons with their neighbors´ public policies (Besley and Case, 1995; Boarnet and Glazer, 2002; Caldeira, 2010; Dahlber and Edmark, 2008; Fiva and Rattsø, 2006; Revelli and Tovno, 2007; Rincke, 2007 and 2009).

Focusing on the main interest of this paper on decentralized welfare benefits, the previous literature has mainly analyzed territorial interdependency to test whether migration of poor households causes a race-to-the-bottom due to the generosity of welfare benefits and whether migration of rich households and firms causes a race-to-the-bottom of tax rates and benefit levels. In the former body of literature, the bottom-line idea is that households migrating to those jurisdictions with higher benefits would discourage governments from improving their welfare coverage. The empirical evidence on this particular issue is mixed. While Dahlberg and Edmark (2008), Gramlich (1982), Tweedie (1994) and Smith (1991) find evidence of a race-to-the-bottom, a number of other studies by Berry et al (2003), Fiva and Rattsø (2006) and Shroder (1995) find no evidence that such a competition game regarding welfare benefits actually exists. However, it is important to

remark that migration of poor households is not a necessary condition for governments to influence each other. It would be enough for a government to fear attracting the poor in order for that to influence their behavior and for competition to take place. This is more in line with what we are expecting to find in the Spanish case, since Spanish poor households are extremely immobile, but there seems to be a multilateral surveillance through which all territories influence each other regarding social policies in general and welfare benefits in particular.

Besides the horizontal interdependence of regional policies, the literature on fiscal federalism has also analyzed the existence of vertical externalities: decisions made at one level of government condition those made by upper or lower levels of administration. This vertical interdependence has been analyzed in depth in the context of tax policy design and fiscal space of the different administration levels (Keen, 1998; Esteller-More and Solé-Ollé, 2001; Dahlby and Wilson 2003; Anderson et al., 2004; Martínez-López, 2005). The general view is that the overexploitation of tax bases by one level of government tends to erode other governments´ tax bases and therefore results in lower tax yields. However, when it comes to expenditure programs in general, and welfare benefits in particular, this kind of vertical externalities have been much less studied in the previous literature. From the perspective of the current paper, there is a need to analyze to what extent subnational governments use central administration´s benefits as a benchmark when determining their own welfare benefit levels.

3.2. A basic model for yardstick competition in social welfare policies

As stated above, yardstick competition is based upon "informational" externalities among neighbouring jurisdictions. These neighbouring jurisdictions tend to mimic each other's policy because imperfectly informed voters use information on public policies in the other jurisdictions as a yardstick in the assessment of their own government's policies (Besley and Case, 1995).

The discipline effect resulting from this comparison gives rise to a sort of competition with some jurisdictions mimicking the decisions of neighbouring jurisdictions. This hypothesis is the core of the basic model of yardstick competition and which we apply to the case of social welfare policy design in a decentralized setting. In the prototypical

model of this type of competition the key variable is the reaction function of every government to changes in the benefit levels in other jurisdictions. The incentive for each government to reevaluate and change its own policy has its origin, as has been stressed above, in the very reaction of the voters when they can evaluate their government's outcomes in comparison to those obtained by the governments of the neighboring jurisdictions.

Formally, consider a set of N jurisdictions, in each of which there are identical taxpayers (r) and identical non-taxpayer individuals who are recipients of the welfare program (c). In a given jurisdiction i, total population is $p_i=r_i+c_i$. We assume that taxpayers have preferences for redistribution and care about the income levels of the poor individuals (non-taxpayers) in that jurisdiction. Hence, the utility of taxpayers depends on their own disposable income (y_i) and on the jurisdiction's welfare expenditure per recipient (e_i):

$$U(r_i) = U(y_i,e_i;X) \qquad [1]$$

where X is a vector of socioeconomic characteristics in jurisdiction i that may also affect utility.

The budget constraint corresponding to a taxpayer in jurisdiction i can be expressed as:

$$y_i = Y_i - R_i e_i \qquad [2]$$

where Y_i is total income and R_i is the recipiency ratio in the jurisdiction ($R_i = c_i / r_i$).

As shown by Revelli (2006), given this constraint, utility maximization gives rise to a welfare function in which social welfare expenditure —using the standard log-linear specification— is given by:

$$\ln(e_i) = \sum_{j=1}^{J} \alpha_j \ln(X_{ij}) + \gamma_F \ln(Y_i) + \delta_R \ln(R_i) + \varepsilon_i \qquad [3]$$

If we assume that welfare policies in other jurisdictions may have an effect on voters and consequently on incumbent politicians, equation (3) needs to be extended to include the

welfare expenditure levels in the neighbouring jurisdictions. The impact of welfare policies in those jurisdictions on the expenditure level in jurisdiction *i* can be modelled as a weighted average of neighbouring jurisdictions' expenditures:

$$\ln(e_i) = \sum_{j=2}^{J} \alpha_j \ln(X_{ij}) + \gamma_F \ln(Y_i) + \delta_R \ln(R_i) + \lambda_e [\sum_{n=1}^{N} \theta_{in} \ln(e_n)] + \varepsilon_i \qquad [4]$$

where θ_{in} are the weights corresponding to the neighboring jurisdictions and λ represents the government response function to welfare designs in those jurisdictions. The reaction function included in the last expression is linear, and it may slope up or down. The slope will be zero in the case where yardstick competition is absent. As stressed by different authors, there is an econometric problem in estimating equation (4) since the expenditure levels on the right-hand-side are endogenous variables given that the expenditure benefit levels in all jurisdictions are jointly determined via strategic interactions (see, for example, Dahlberg and Edmark, 2008).

We can now utilize this same framework for the analysis of benefit levels –in lieu of expenditures. Let b_{it} be the benefit level for the welfare program in jurisdiction *i* at time *t*. Benefits in that jurisdiction are a function of total income of taxpayers, socioeconomic characteristics and the recipiency ratio in the jurisdiction, and welfare benefits in neighbouring jurisdictions.

One difference with the previous literature is that we also account for the potential presence of vertical externalities. Our full specification of the reaction function shows not only how a given jurisdiction reacts to changes in the benefit levels in neighboring jurisdictions, but also an additional term accounting for how the welfare benefits in each jurisdiction may be affected by changes in other social benefits that are set by the central government. If this assumption of vertical interdependence holds, [4] becomes

$$\ln(b_i) = \sum_{j=2}^{J} \alpha_j \ln(X_{ij}) + \gamma_F \ln(Y_i) + \delta_R \ln(R_i) + \lambda_b [\sum_{n=1}^{N} \theta_{in} \ln(b_n)] + \lambda_g \ln(g) + \varepsilon_i \quad [5]$$

where g is the benefit level defined by the central government for other social benefits.

Past research has concluded that welfare migration might alter this equilibrium. As stressed by Brueckner (1998), the socially optimal benefit levels correspond to a framework in which there is no mobility of beneficiaries between jurisdictions, or that alternatively there is a sufficiently balanced system of matching grants that nullify welfare migration. As we saw in section two above, the Spanish case of decentralized provision of welfare benefits is likely to meet the first of these conditions, given that welfare migration is highly restricted by severe requirements regarding residence, low benefit levels, the important role of extended family networks, and the very high percentage of residential property ownership.

We also need to consider that there might be other forms of endogeneity. As shown by Moffitt (1999), voters might react negatively to increases in welfare spending by seeking retrenchments in the system. Lower levels of benefits or stricter requirements to reduce the number of recipients could become endogenous variables used by policy-makers (Ayala and Triguero, 2017). That is, governments can change the level of benefits or the recipiency ratio to control welfare expenditure. A key institutional characteristic in the strategic behavior between the different levels of government is the actual distribution of the costs implied by the addition of new recipients. However, in the case of completely decentralized programs –like the Spanish one–, all the costs resulting from increasing the number of recipients will correspond to local governments.

4. EMPIRICAL METHODOLOGY

As already mentioned, our main aim is to understand what drives the relative generosity of Spanish regional welfare benefits, paying special attention to the potential existence of vertical and horizontal externalities. After controlling for supply-demand factors, how much do neighbor and central governments´ decisions affect the welfare policies of regional governments?

To answer those questions, we use a panel dataset for regional welfare benefits from 1996 to 2015. The first thing to address is the selection of our dependent variable(s). Considering that welfare programs provide several benefit levels targeted to different groups and with distinct qualification requirements, it is important to use those of a more comprehensive nature or most representative of the regional programs universe. For that

reason, we will be using the maximum amount received by the first recipient (the so-called basic benefit) as our dependent variable.

In line with the theoretical model expressed in equation [5], the reaction function of government *i* will depend on the following set of explanatory variables:

- Taxpayers´ income in the region, proxied as regional GDP per capita ($GDPpc_{it}$).
- A vector of regional socioeconomic and institutional characteristics (X_{it}) including: severe poverty (percentage of total households with no income), which captures regional social needs; pro-redistribution preferences, which reflect the regional residents' willingness to fight poverty; government´s ideology, which captures regional authorities´ bias towards alleviating poverty; and a dummy variable called *Foral*, which controls for the larger affordability of welfare benefits in the two charter regions (the Basque Country and Navarre).
- The recipiency ratio, expressed as the weight of welfare beneficiaries in the regional population ($RecipRatio_{it}$).
- Yardstick competition (horizontal externalities) variables: in order to test whether neighbors´ behavior influence the level of generosity of regional welfare benefits, the first thing to tackle is to decide which territories are relevant neighbors and which are not. Different approaches have been followed in the literature on this specific issue. Some authors have used the inverse distance between two territories (Anselin, 1988). With this perspective, Pinkse and Slade (1998) use a fixed number of those nearest neighbors. Other researchers have used income levels or ethnic composition (Case et al., 1993) and the structure of the social network (Doreian, 1980) as indicators of proximity. Here we will use three other approaches. First, we will follow the most commonly used approach, which considers as relevant neighbors only those regions that share a common geographical border ("Neighborhood 1" in our estimations). Second, we will consider that interdependencies actually take place among all regions, so all of them need to be included as neighbors ("Neighborhood 2" in our estimations). And last, regions will be clustered depending on their per capita GDP, so that territories with a similar level of income are considered neighbors, irrespectively of their geographical location ("Neighborhood 3" in our estimations). After establishing which regions influence each other, we will follow the most usual

approach in the literature and construct a matrix of welfare benefits with the same weight for each neighbor ($\sum NWB_{it-1}$).

- Vertical externalities: here we use the average Social Security´s pensions payed (by the central government) in each territory ($Pension_{it-2}$); as already mentioned, this variable tries to capture how decisions made by the central authorities influence the level of benefits implemented by ACs.

As mentioned above, the econometric approach requires taking into account that some of the regressors proposed may be endogenous. In particular, the simultaneous determination of neighbors´ benefits requires tackling the potential endogeneity problem. However, unlike previous studies analyzing the US system, we are not expecting migration movements due to changes in welfare benefit programs. Poor households in Spain are extremely immobile -benefit levels are low, and there are strict access requirements regarding residence in the region during the previous years-, thus no endogeneity problems should be expected regarding the number of beneficiaries.[7] As a result, and in order to address the endogeneity problem just mentioned above, we adopt a two-stage ordinary least squares estimation model, using neighbors´ level of benefits in t-1 as our explanatory endogenous variable in the main equation [6], and the average Social Security pension in each territory in t-2 plus the recipiency ratio as instruments in the auxiliary instrumental equation [7]:[8]

$$WB_{it} = \beta_0 + \beta_1 GDPpc_{it} + \beta_2 X_{it} + \beta_3 \sum \widehat{NWB}_{it-1} + \varepsilon_{it} \quad [6]$$

$$\widehat{NWB}_{it-1} = \alpha_0 + \alpha_1 Pension_{it-2} + \alpha_2 RecipRatio_t \quad [7]$$

where $\sum \widehat{WB}_{it-1}$ represents the matrix including the neighbors´ welfare benefits in t-1 and ε_{it} represents the error term.

After analyzing the determinants of regional welfare benefits from a static perspective, we check the robustness of the results by running dynamic models that will separately

[7] The Hausman test was used to check the existence of endogeneity. In this case, the null hypothesis is that both OLS with fixed effects and 2SLS estimators are consistent but the second one is also efficient. Endogeneity tests were conducted and are available upon request.

[8] Therefore, the logic of our model is that the central government decides Social Security pensions in t-2, influencing regions´ welfare benefits in t-1. After that, region *i* decides the maximum amount of basic benefits in year t.

address the influence of neighbors´ policies and any existing inertia. To do so, we first use a System-GMM model that is better suited for cases with panel data sets and the presence of strong fixed effects. The one-step system generalized method of moments' estimator (Arellano and Bover, 1995, and Blundell and Bond, 1998) allows for the existence of omitted variables, endogeneity and measurement error problems.

In the absence of suitable external instruments, we could apply the first-differenced generalized method of moments estimator proposed by Arellano and Bond (1991). However, using the model only in first-differences may lead to important finite sample bias problems when variables are highly persistent, which is expected to be the case for variables such as the benefit levels in the regional welfare schemes. Previous studies have shown that this was the case when analyzing the driving forces of poverty trends using a regional data panel (Ayala, Cantó and Rodríguez, 2017). Moreover, the removal of unobserved time-invariant effects may lead to a spuriously better fit for the data and to a change in the inference drawn from the estimation (Bond et al. 2001; Malinen, 2013). Under these conditions, lagged levels of the variables are only weak instruments for subsequent first-differences. To overcome this problem, the system-GMM procedure (Arellano and Bover, 1995; Blundell and Bond, 1998) adds a set of equations in levels to the first-difference model, where the instruments of the levels are suitable lags of their own first differences.

Besides the explanatory variables included in equation [5], the dynamic approach also includes the lag of the dependent variable as a regressor, therefore controlling for the inertia effect of welfare benefits implemented in the previous year:

$$WB_{it} = \beta_0 + \beta_1 WB_{it-1} + \beta_2 GDPpc_{it} + \beta_3 X_{it} + \beta_4 \sum \widehat{NWB}_{it-1} + \mu_i + u_{it} \quad [8]$$

where μ_i represents the unobservable heterogeneity and u_{it} is the error term.

To interpret the results of the dynamic estimations, several tests have been run. First of all, and in order to check the suitability of the dynamic approach, we implement the Arellano-Bond test for autocorrelation. The null hypothesis here is that there is no autocorrelation of first and second order. We are expecting a first order process of autocorrelation, but not a second order one. Secondly, we run the Sargan test for over-

identifying restrictions, in which the null hypothesis is that instruments as a group are exogenous.

Given the relevance of inertia in the benefit levels, we conduct an additional robustness check by estimating a Panel Corrected Standard Errors model. This allows us to separately address the inertia of our dependent variable by estimating a composite error term that includes both an autoregressive vector and the usual random walk. In this case, the equation to estimate is given by:

$$WB_{it} = \beta_0 + \beta_1 GDPpc_{it} + \beta_2 X_{it} + \beta_3 \sum \widehat{NWB}_{it-1} + \varepsilon_{it} \qquad [9]$$

where $\varepsilon_{it} = \alpha_1 WB_{it-1} + \mu_{it}$

As highlighted by Lago et al. (2018), Panel Corrected Standard Errors are robust to both cross correlation and cross-section heteroskedasticity. When there are long time lapses -larger than 20-, the usual bias of autoregressive models with fixed effects becomes small and therefore this method is suitable for our sample.

5. RESULTS

5.1. Static approach

Tables 1 and 2 show the results obtained when a static strategy (2SLS) is applied. In the first case, we show the results for equations 6 and 7 -using Social Security pensions and the recipiency ratio as instruments. After testing for endogeneity, all estimations point to the existence of both horizontal and vertical externalities in the design of regional welfare benefits. Neighbors´ benefits act as an important driver of own benefits, with a positive and always significant coefficient. And this holds for the three different neighborhood criteria explained above. However, it is also true that the influence seems to be larger among neighbors sharing physical boundaries, since coefficients obtained under this scenario (Neighborhood 1) are systematically larger.

The results for the first stage (auxiliary) equation also point to the existence of vertical externalities: Central government-driven Social Security average pension benefits payed in each territory seem to be an important driver of neighbors´ basic benefits, and therefore this variable appears to work correctly as an instrument (see tables A.3 and A.4 in the Appendix for the results of the auxiliary equation). Meanwhile, the recipiency ratio has a more sensitive behavior, showing a positive sign when using Neighborhood 1, and a negative one when using Neighborhood 2 and 3.

The results also suggest that, under the current institutional design of welfare benefits, with no federal funding or coordination whatsoever, regional resources seem to explain the generosity of benefits to a good extent. This evidence indicates that, as far as regional welfare benefits are concerned, the Spanish model of "radical federalism" does not promote inter-territorial cohesion, since it allows the richer to be more generous than the poorer regions. This is in line with the literature that has extensively examined the under-provision of welfare under a decentralized design in the U.S. (Brown and Oates, 1987; Brueckner, 2000; Wheaton, 2000; Ayala et al. 2017). These results are further enhanced by the significant, positive and large coefficients of the variable "Foral", which controls for the special financial regime of the two charter regions in Spain (Navarre and the Basque Country). In their case, the greater fiscal autonomy they enjoy and their low contribution to the inter-territorial solidarity funding allows them to implement much more generous welfare benefits.

Note that our poverty variable does not have a very stable behavior within the model, probably due to the high correlation with GDP. A similar problem seems to apply to the ideology variable. However, in this latter case, we find that it turns out to be positive when significant. In order to address the potential multicollinearity of both poverty and ideology, we introduced an interaction term that shows a significant and positive sign when using Neighborhood 1.

When running the over-identification test (the Sargan test) on the previous specifications, we find that only the first column of table 1 displays correct results. The rest of the specifications suggest that we can reject the null hypothesis that instruments as a group are exogenous. Therefore, we replicate the estimations of table 1 using Social Security pensions as the only instrument. Results are displayed in table 2 and turn out to be very

similar to the ones obtained with two instruments: regions influence each other when determining the maximum amount of welfare benefits, and Social Security pensions partly explain the level of benefits decided by the regions as a whole.

5.2. Dynamic approach

Although we find strong evidence of both horizontal and vertical externalities in the generosity of basic benefits, it is important to highlight that the results obtained under a static approach could be somewhat biased due to the strong inertia of budgetary variables, in particular the level of welfare benefits.

In order to check the robustness of the results displayed above, we first run a dynamic System-Generalized Method of Moments (System-GMM) model that allows to disentangle the influence of neighbors´ policies and the role of inertia. In this specification, the lagged dependent variable is introduced as an additional regressor.

Table 3 displays the results of the dynamic approach, under several different scenarios. We run the regressions including Social Security pensions and the recipiency ratio as additional instruments. In table 4 we exclude GDP from the regressors in order to test the sensitivity of the results. When testing for autocorrelation, the Arellano-Bond test displays the expected results ($p<0,05$ in AR1 and $p>0,05$ in AR2) in all the estimations. Overidentification tests work well under the versions of Neighborhood 1 and 3 ($p>0,05$), but not under neighborhood 2.

All in all, the results still point to the presence of horizontal externalities, although coefficients become smaller than in the static models, likely due to the large influence of the lagged dependent variable. Regional resources (per capita GDP and Foral) seem to be extremely relevant in the determination of welfare benefits. Ideology, in contrast to what happened under the static models, seems to have a consistent and positive influence on the benefit levels as well: left-wing governments tend to be more generous than right-wing governments in welfare programs. Once again, poverty has a very sensitive behavior, displaying positive and negative coefficients (not always significant) depending on the inclusion or exclusion of GDP in the equation and on the neighborhood variable scenario.

Table 5 shows the results for the additional robustness check using the Panel Corrected Standard Errors model. This estimates basically produce additional empirical evidence of both horizontal and vertical externalities. The coefficients of neighbors´ welfare benefits in the main equation are larger than under the System-GMM model, and more in line with the ones obtained with 2SLS. This provides further evidence on the presence of a positive influence of neighboring jurisdictions.

As for the presence of vertical externalities, the results for the auxiliary equation (see Table A.5 in the Appendix) imply that the centrally determined Social Security pension levels do work as a benchmark for the determination of regional welfare benefits. Finally, regarding the autoregressive vector of the error term, the values of Rho in table 5 around 0,7 suggest the expected presence of inertia in our dependent variable.

Summarizing, very similar results are found in both the static and dynamic approaches. While benefit levels in each region largely depend on regional resources, our empirical results also lend strong support to the yardstick competition hypothesis: regional public agents observe what their peers are doing and act accordingly.

6. CONCLUSIONS

The literature on welfare decentralization has traditionally stressed the potential positive effects of fiscal devolution both in terms of efficiency and coverage of the programs. Regional governments are in a better position to understand both social preferences and needs of poor households and generally they can implement these programs more effectively. However, the expectation that a decentralized provision of welfare is supposed to foster citizens´ wellbeing is challenged by problems of coordination and financing, which at the end may produce a mosaic of highly varied programs —with a striking disparity of protection levels. In addition, competition among jurisdictions does not always yield the result of positive innovation. Ignoring these constraints can result in a generally regressive nationwide distribution of benefits, with the richest jurisdictions paying much higher benefits than the less wealthy ones.

These limitations, common to any decentralized welfare system, can be fostered in models of "radical fiscal federalism", where federal coordination and/or funding do not exist. This is the case of the Spanish latest safety net design, where these programs were entirely created and regulated by the regional governments.

In this paper we use panel data for Spanish regions with the aim of answering one essential question: Does yardstick competition among ACs partly explain the level of regional welfare benefits in Spain? While the answer to this question is not a priori obvious, our empirical results corroborate the presence of significant horizontal externalities. We find strong evidence of yardstick competition and horizontal externalities: ACs observe what their neighboring governments are doing and then decide their own basic benefit levels. Therefore, our results confirm the conventional wisdom on the territorial interdependency of policy decisions with respect to welfare benefit levels, even within a highly fiscally decentralized framework —where there is no participation of the central government in the design, regulation or financing of the system.

In addition, we find that regions use the central government-determined average pension in their respective territories as a benchmark for determining their own welfare benefit levels. This indicates the presence also of important vertical externalities in the design of decentralized welfare policies. This is more notable, because that vertical externality takes place in the context of a "radical fiscal federalism" model. Even in this case, the decisions made at one level of government condition those made by other levels of administration.

These results obtained with static approaches are also confirmed when the proposed relationships are analyzed using dynamic models. Given the probable inertia of benefits levels, the results obtained under static approaches could be somewhat biased. Our results with different dynamic models show that while benefit levels in each region largely depend on regional resources, the yardstick competition hypothesis is confirmed again: regional public agents observe what their peers are doing and act accordingly. The results of the dynamic models also confirm the presence of vertical externalities.

In short, in this paper we contribute to the current literature by providing strong supporting evidence for the role played by horizontal and vertical externalities in the

determination of decentralized welfare benefits in contexts where there is complete decentralization of these policies.

References

Allers, M. and J. Elhorst (2005): "Tax Mimicking and Yardstick Competition among Local Governments in the Netherlands", *International Tax and Public Finance*, 12(4), 493-513.

Anderson, L., T. Aronsson, and M. Wikstrom (2004): "Testing for vertical fiscal externalities", *International Tax and Public Finance* 11(3), 243-263.

Arellano, M. and S. Bond (1991): "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations", *Review of Economic Studies* 58, 277-297.

Arellano, M. and O. Bover (1995): "Another look at the instrumental-variable estimation of error-components models". *Journal of Econometrics* 68, 29-52.

Ayala, L., E. Bárcena-Martín and J. Martínez-Vázquez (2017): "The Unintended Distributional Costs of Devolution in The U.S. Welfare Reform," International Center for Public Policy Working Paper Series, GSU paper1719, Georgia State University.

Ayala, L., O. Cantó and J.G. Rodríguez (2107): "Poverty and the business cycle: The role of intra-household distribution of unemployment". *Journal of Economic Inequality* 15, 47-73.

Ayala, L. and A. Triguero (2017): "Economic Downturns, Endogenous Government Policy and Welfare Caseloads", *Hacienda Pública Española*, 220-(1/2017), 107-136.

Baicker, C. (2005a): "The spillover effects of state spending", *Journal of Public Economics* 89, 529-544.

Baicker, K. (2005b): "Extensive or intensive generosity? The price and income effects of federal grants". *Review of Economics and Statistics* 87, 371-384.

Berry, W., R. Fording, and R. Hanson (2003): "Reassessing the "Race to the Bottom" in State Welfare Policy", *The Journal of Politics*, 65(2), 327-349.

Besley, T. and A. Case (1995): "Incumbent Behavior: Vote Seeking, Tax Setting and Yardstick Competition", *American Economic Review*, 85(1), 25-45.

Blundell, R. and S. Bond (1998): Initial Conditions and Moment Restrictions in Dynamic Panel Data Models", *Journal of Econometrics* 87, 115-143.

Boarnet, M. and A. Glazer (2002): "Federal Grants and Yardstick Competition", *Journal of Urban Economics*, 52, 53-64.

Bond, S., A. Hoeffler and J. Temple (2001): "GMM Estimation of Empirical Growth Models," *Economics Papers* 2001-W2 1, Economics Group, Nuffield College, University of Oxford.

Bordignon, M., F. Cerniglia, and F. Revelli (2003): "In Search of Yardstick Competition: A Spatial Analysis of Italian Municipality Property Tax Setting", *Journal of Urban Economics*, 54, 199-217.

Bordignon, M., F. Cerniglia, and F. Revelli (2004): "Yardstick Competition in Intergovernmental Relationships: Theory and Empirical Predictions", *Economic Letters*, 83, 325-333.

Brown, C.C., and W. Oates (1987): "Assistance to the poor in a federal system". *Journal of Public Economics* 32, 307-330.

Brueckner, J. (1998): "Welfare Reform and Interstate Welfare Competition: Theory and Evidence", The Urban Institute, *Occasional Papers*, n. 21.

Brueckner, J. (2000): "Welfare reform and the race to the bottom: Theory and evidence". *Southern Economic Journal* 66, 505-525.

Brueckner, J. (2003): "Strategic Interaction Among Governments: An Overview of Empirical Studies", *International Regional Science Review*, 26(2), 175-188.

Buchanan, J. (1950): "Federalism and Fiscal Equity", *The American Economic Review*, 40(4), 583-599.

Buchanan, J. (1965): "An Economic Theory of Clubs", *Economica*, 32(125), 1-14.

Busemeyer, M. (2007): "Determinants of Public Education Spending in 21 OECD democracies, 1980-2001", *Journal of European Public Policy*, 14(4), 582-610.

Caldeira, E. (2010): "Yardstick Competition in a Federation: Theory and Evidence from China", CERDI, *Etudes et Documents*, n.18.

Cantarero, D. y S. Lago (2012): "Decomposing the Determinants of Health Care Expenditure: The Case of Spain", *The European Journal of Health Economics*, 13(1), 19-27.

Case, A. and H. Rosen (1993): "Budget Spillovers and Fiscal Policy Interdependence", *Journal of Public Economics*, 52, 285-307.

Castles, F. (1989): "Explaining Public Education: Expenditure in OECD Nations", *European Journal of Political Research*, 17, 431-448.

Chernick, H. 1998. "Fiscal Effects of Block Grants for the Needy: An Interpretation of the Evidence", *International Tax and Public Finance*, 5, 205–233.

Chernick, H. 2000. "Federal Grants and Social Welfare Spending: Do State Responses Matter?", *National Tax Journal* 53, 143-152.

Costa-Font, J. (2010): "Does Devolution Lead to Regional Inequalities in Welfare Activity?", *Environment and Planning C: Government and Policy*, 28, 435-449.

Costa-Font, J. y J. Pons-Novell (2007): "Public Health Expenditure and Spatial Interactions in a Decentralized National Health System", *Health Economics*, 16(3), 291-306.

Costa-Font, J. y A. Rico (2007): "Devolution and the Interregional Inequalities in Health and Healthcare in Spain", *Regional Studies*, 40(8), 875-887.

Cutler, D.; D. Elmendorf; y R. Zeckhauser (1993): "Demographic Characteristics and the Public Bundle", *Working Papers*, NBER, n. 4283.

Dahlberg, M. and K. Edmark (2008): "Is There a "Race-to-the-bottom" in the Setting of Welfare Benefit Levels? Evidence from a Policy Intervention", *Journal of Public Economics*, 92, 1193-1209.

Dahlby, B. and L. S. Wilson (2003): "Vertical fiscal externalities in a federation", *Journal of Public Economics* 87, 917-930.

Di Matteo, L. y R. Di Matteo (1998): "Evidence on the Determinants of Canadian Provincial Government Health Expenditures: 1965-1991", *Journal of Health Economics*, 17, 211-228.

Esteller-Moré, A and A. Solé-Ollé (2001): "Vertical income tax externalities and fiscal interdependence: evidence from the US", *Regional Science and Urban Economics*, 31, 247-272.

Falch, T. y J. Rattsø (1997): "Political Economic Determinants of School Spending in Federal States: Theory and Time-Series Evidence", *European Journal of Political Economy*, 13, 299-314.

Falch, T. y J. Rattsø (1999): "Local Public Choice of School Spending: Disaggregating the Demand Function for Educational Services", *Economics of Education Review*, 18, 361-373.

Fernández, R. y R. Rogerson (1997): "The Determinants of Public Education Expenditures: Evidence from the States, 1950-1990", *Working Papers*, NBER, n.5995.

Fiva, J. and J. Rattsø (2006): "Welfare Competition in Norway: Norms and Expenditures", *European Journal of Political Economy*, 22, 202-222.

Gramlich, E., H. Aaron, and M. Lovell (1982): "An Econometric Examination of the New Federalism", *Brookings Papers on Economic Activity*, 2, 327-370.

Herrero, A. y J.M. Tránchez (2016): "Demographic, Political, Institutional and Financial Determinants of Regional Social Expenditure. The Case of Spain", *Regional Studies*, doi=10.1080/00343404.2016.1146822

Johnson, L. (2014): "Yardstick Competition: An Empirical Investigation Using State Taxes and Media Markets", Doctoral Thesis, MIT.

Keen, M. (1998): "Vertical tax externalities in the theory of fiscal federalism", *IMF Staff Papers* 45, 454-485.

Kotsogiannis, C. and R. Schwager (2006): "On the Incentives to Experiment in Federations", *Journal of Urban Economics*, 60, 484-497.

Lago, S.; J. Martínez-Vázquez; and A. Sacchi (2018): "Fiscal Stability During the Great Recession: Putting Decentralization Design to the Test", GEN, *Working Papers*, N.2018-6.

López-Casasnovas, G; J. Costa-Font; and I. Planas (2005): "Diversity and Regional Inequalities in the Spanish System of Health Care Services", *Health Economics*, 14, 221-235.

López-Casasnovas, G. y M. Sáez (2006): "A Multilevel Analysis on the Determinants of Regional Health Care Expenditure: A Note", *European Journal of Health Economics*, 8(1), 59-65.

Magazzino, C. y M. Mele (2012): "The Determinants of Health Expenditure in Italian Regions, *International Journal of Economics and Finance*, 4(3), 61-72.

Malinen, T. (2013): "Inequality, savings and consumption: a reassessment of the relationship in cointegrated panels," *Applied Economics Quarterly*, 59, 235-251.

Martínez-López, D. (2005): "Fiscal Federalism and public inputs provision". European Central Bank, *Working Paper Series* N. 484.

Martinez-Vazquez, J., S. Lago-Peñas, and A. Sacchi. (2017): "The Impact of Fiscal Decentralization: A Survey", *Journal of Economic Surveys* 31, 1095-1129.

Marton, J., and D.E. Wildasin (2007): "State government cash and in-kind benefits: Intergovernmental fiscal transfers and cross-program substitution", *Journal of Urban Economics* 61, 1–20.

Nguyen, L.; U. Häkkinen; M. Pekurinen; G. Rosenqvist; y H. Mikkola (2009): "Determinants of Health Care Expenditure in a Decentralized Health Care System", *Discussion Papers*, National Institute for Health and Welfare (Finland), n. 21.

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

Painter, G. y K. Bae (2001): "The Changing Determinants of State Expenditure in the United States: 1965-1992", *Public Finance and Management*, 1(4), 370-392.

Poterba, J. (1997): "Demographic Structure and the Political Economy of Public Education", *Journal of Policy Analysis and Management*, 16(1), 48-66.

Prud´homme, R. (1994): "On the Dangers of Decentralization", *Policy Research Working Papers*, The World Bank, n.1252

Revelli, F. (2006): "Performance Rating and Yardstick Competition in Social Service Provision", *Journal of Public Economics*, 90, 459-475.

Revelli, F. and P. Tovno (2007): "Revealed Yardstick Competition: Local Government Efficiency Patterns in Norway", *Journal of Urban Economics*, 62, 121-134.

Ribar, D. and M. Wilhelm (1999): "The Demand for Welfare Generosity", *The Review of Economics and Statistics*, 81(1), 96-108.

Rincke, J. (2007): "Policy Diffusion in Space and Time: The Case of Charter Schools in California School Districts", *Regional Science and Urban Economics*, 37, 526-541.

Rincke, J. (2009): "Yardstick Competition and Public Sector Innovation", *International Tax and Public Finance*, 16, 337-361.

Saavedra, L. (1999): "A Model of Welfare Competition with Evidence from AFDC", ZEW, *Discussion Papers*, n.99-27.

Sanz, I. y F. Velázquez (2007): "The Role of Ageing in the Growth of Government and Social Welfare Spending in the OECD", *European Journal of Political Economy*, 23, 917-031.

Schroder, M. (1995): "Games States Don´t Play: Welfare Benefits and the Theory of Fiscal Federalism", *The Review of Economics and Statistics*, 77(1), 183-191.

Smith, P. (1991): "An Empirical Investigation of Interstate AFDC Benefit Competition", *Public Choice*, 68, 217-233.

Snyder, J. and I. Yackovlev (2000): "Political and Economic Determinants of Changes in Government Spending on Social Protection Programs", Background paper for the "Securing Our Future Study", Massachusetts Institute of Technology, Cambridge

Solé-Ollé, A. (2003): "Electoral Accountability and Tax Mimicking: The Effects of Electoral Margins, Coalition Government, and Ideology", *European Journal of Political Economy*, 19, 685-713.

Strumpf, K. (2002): "Does Government Decentralization Increase Policy Innovation?", *Journal of Public Economic Theory*, 4, 207-241.

Toolsema, L.A. and M.A. Allers (2014): "Welfare financing: Grant allocation and efficiency", *De Economist* 162, 147-166.

Tweedie, J. (1994): "Resources Rather Than Needs: A State-Centered Model of Welfare Policymaking", *American Journal of Political Science*, 38(3), 651-672.

Wheaton, W.C. (2000): "Decentralized Welfare: Will There Be Underprovision?", *Journal of Urban Economics*, 48, 536-555

Figure 1. Regional benefit levels

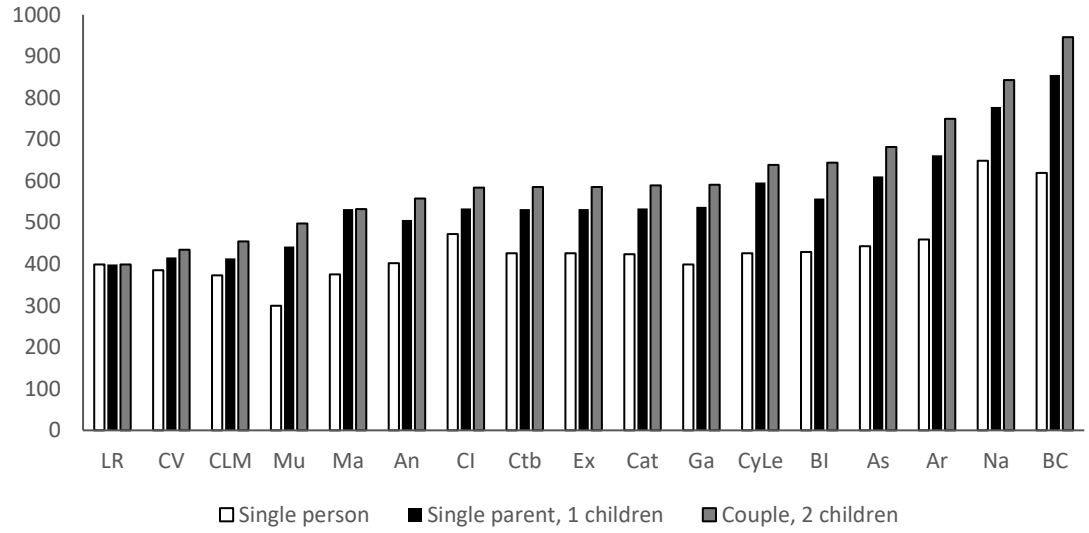

Table 1: Static approach. 2SLS with two instruments (Social Security Pensions and Recipiency Ratio) [9]

	N_1	N_2	N_3	N_1	N_2	N_3
Endogenous Variable: Neighbors´ Benefit	0.6899***	0.6032***	0.4876***	0.6942***	0.6033***	0.4885***
GDP pc	3.8389**	4.8572***	5.9351***	4.0126**	4.8947***	5.9630***
Poverty	-0.2154	3.9909	9.3533**	-4.9876	3.2957	8.5684**
Foral	10.4678***	13.2031***	13.5545***	10.6457***	13.2337***	13.5911***
Ideology	-5.4153	2.3353	5.6656	-30.4555**	-1.8293	1.1234
Ideology*Poverty				10.7948**	1.6844	1.8454
Pensions	Ok (+)	Ok (+)	Ok (+)	Ok (+)	Ok (+)	Ok (+)
Recipiency Ratio	Ok (+)	Ok (-)	Ok (-)	Ok (+)	Ok (-)	Ok (-)
Sargan Test	5.145 [0.0233]	7.833 [0.0051]	9.144 [0.0025]	3.787 [0.0516]	7.616 [0.0058]	8.934 [0.0028]

[9] First stage estimations are displayed in the Appendix

Table 2: Static approach: 2SLS with only one instrument (Social Security Pensions)

	N_1	N_2	N_3	N_1	N_2	N_3
Endogenous Variable: Neighbors´ Benefit	0.6715***	0.6239***	0.5427***	0.6658***	0.6259***	0.5441***
GDP pc	4.3556**	4.5601**	4.9919**	4.2082***	4.4874***	4.9224***
Poverty	-4.2187	2.5707	6.7920*	0.5350	3.1977	7.5341**
Foral	10.7016***	13.2907***	13.8163***	10.5303***	13.2657***	13.7876***
Ideology	-30.2382**	-1.5371	2.4027	-5.5584	2.7023	7.1799
Poverty*Ideology	10.6434*	1.7006	1.9162			
Instrument: Second Lag of Social Security Pensions	Ok (+)	Ok (+)	Ok (+)	Ok (+)	Ok (+)	Ok (+)

Table 3: Dynamic approach (I): System GMM

	Instruments: Social Security Pensions					
	N_1	N_2	N_3	N_1	N_2	N_3
Lagged Dep Var	0.8505***	0.8589***	0.8891***	0.8512***	0.8570***	0.8851***
Lagged Neighbors´ benefit	0.0467*	0.0175	-0.0373	0.0483*	0.0108	-0.0384
GDP pc	0.7186**	1.0073**	1.3601***	0.7090**	1.0413**	1.3912***
Foral	2.2186***	1.9895***	1.4241**	2.2020***	2.0266***	1.4845***
Ideology	9.2301***	7.0166**	5.9684**	6.7101	16.3001**	12.1753**
Poverty	-1.5646	1.1241	1.8066	-2.1135	2.8439	2.9296*
Poverty*Ideology				1.0750	-3.3365	-2.4678
Arellano-Bond test AR (1)	-5.71	-3.54	-3.14	-5.07	-4.12	-3.10
	[0.000]	[0.000]	[0.002]	[0.000]	[0.000]	[0.002]
Arellano-Bond test AR(2)	-0.53	-1.06	-0.44	-0.51		-0.51
	[0.595]	[0.291]	[0.656]	[0.612]		[0.611]
Sargan test	255.80	267.02	290.06	254.71	267.19	291.27
	[0.117]	[0.001]	[0.054]	[0.117]	[0.000]	[0.045]

Table 4: Dynamic approach (II): System GMM

	Instrument: Social Security Pensions			Instruments: Social Security Pensions & Recipiency Ratio					
	N_1	N_2	N_3	N_1	N_2	N_3	N_1	N_2	N_3
Lagged Dep Var	0.8659***	0.8766***	0.9005***	0.8646***	0.8714***	0.9019***	0.8653***	0.8702***	.8989***
Lagged Neighbors´ benefit	0.0675***	0.0551*	0.0182	0.0680**	0.0583*	0.0177	0.0697**	0.0538	0.01781
Foral	2.3026***	2.2047***	2.0024***	2.3256***	2.3005***	1.9704***	2.3010***	2.3412***	2.0296***
Ideology	7.8347***	5.4389*	4.5288*	7.8243**	5.4653*	4.5803*	4.4284	13.3608*	9.5854
Poverty	-2.7153**	-0.9797	-0.2506	-2.6461*	-0.8528	-0.2970	-3.3716*	0.5609	0.5742
Poverty*Ideology							1.4595	-2.8537	-2.0002
Arellano-Bond test	-7.28		-3.19	-5.65	-3.03	-3.03	-5.00	-3.67	-2.97
AR (1)	(0.000)		(0.001)	[0.000]	[0.002]	[0.002]	[0.000]	[0.000]	[0.003]
Arellano-Bond test	-0.55		-0.48	-0.55		-0.49	-0.53		-0.55
AR(2)	(0.581)		(0.632)	[0.579]		[0.627]	[0.598]		[0.583]
Sargan test	256.41	267.96	294.78	256.98	269.76	294.73	255.44	270.47	296.06
	(0.112)	(0.000)	(0.036)	[0.116]	[0.000]	[0.040]	[0.120]	[0.000]	[0.033]

Table 5: Dynamic approach (III): Panel Corrected Standard Errors model

	Two Instruments						One instrument		
	N1	N2	N3	N1	N2	N3	N1	N2	N3
Endogenous variable: Neighbors´ Benefit	0.7145***	0.6823***	0.4649***	0.6818***	0.5537***	0.4227***	0.6733***	0.5784***	0.4845***
GDPpc	2.4540*	3.3743**	4.1636**	4.8963**	7.1086**	8.8394***	4.9439**	6.6716**	7.6929**
Poverty	10.8813***	7.6597**	11.5255***	8.5681**	8.1733**	11.5451***	8.7772**	7.9134**	10.8899***
Foral	105.1384***	122.5212***	123.2615***	119.927***	121.3751***	143.229***	74.8955**	86.6246**	152.627***
Ideology	0.4156	3.5938	9.6735**	-3.6099	0.9537	4.3857	-4.1720	1.2393	5.6717
Rho	0.8288	0.8327	0.8309	0.6826	0.6998	0.6679	0.7137	0.7048	0.6767
Fixed effects	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes

APPENDIX

Table A.1: Variables description

	Description	Source
BB	Basic benefit (maximum amount) received by an individual	
BH2A	Benefit (maximum amount) received by a household with 2 adults + 2 children	
BH1A	Benefit (maximum amount) received by a household with 1 adult + 2 children	
Poverty	Severe poverty rate	
Pro-redistribution preferences	Percentage of citizens that, asked about the purpose of taxes, answer that they are collected in order to better distribute wealth within the society. Constructed based on the results of a poll implemented by the Spanish Centre of Sociological Research: "Opinión Pública y Política Fiscal". (1996-2016).	Centro de Investigaciones Sociológicas www.cis.es
Resources	As a proxy of regional resources, per capita GDP was used	Instituto Nacional de Estadística www.ine.es
Foral	Dummy variable that amounts 1 when a special regional financial regime applies	
Ideology	Dummy variable that amounts 1 with a left-wing or center-left-wing incumbent	
Pension	Average Social Security pension in t-2 in region i	Social Security www.seg-social.es
NWBB	Neighbors´ welfare basic benefits in t-1	
NWBH2A	Neighbors´ welfare benefits for households with 2 adults + 2 children in t-1	
NWBH1A	Neighbors´ welfare benefits for households with 1 adult + 2 children in t-1	
RecipRatio	Recipiency ratio: share of total population that qualifies for welfare benefits	
LR	La Rioja	
CV	Valencia	
CLM	Castile-La Mancha	

Mu	Murcia
Ma	Madrid
An	Andalusia
CI	Canary Islands
Ctb	Cantabria
Ex	Extremadura
Cat	Catalonia
Ga	Galicia
CyLe	Castile-Leon
BI	Balearic Islands
As	Asturias
Ar	Aragon
Na	Navarra
BC	Basque Country

Table A.2: Variables' Descriptive Statistics

	N	Average	Standard Deviation	Min	Max
BB	340	345.7	94.9	180.3	665.9
BH2A	340	486.9	144.7	180.3	945.9
BH1A	340	449.5	136.1	180.3	941.1
Poverty	340	2.39	1.07	0.36	7.15
Pro-redistribution preferences	238	11.0	6.94	0	42.4
Resources	340	19.4	5.37	7.76	32.2
Foral	340	0.12	0.32	0	1
Ideology	340	0.37	0.48	0	1
Pension (Neighborhood 1)	323	618.6	162.8	363.4	985.8
Pension (Neighborhood 2)	323	621.2	156.5	395.3	878.3
Pension (Neighborhood 3)	323	622.6	168.5	366.8	1076.7
NWBB (Neighborhood 1)	340	304.6	134.4	0	537.3
NWBB (Neighborhood 2)	340	345.8	74.6	222.5	444.2
NWBB (Neighborhood 3)	340	345.5	89.2	205.0	665.9
NWBH2A (Neighborhood 1)	340	420.9	192.3	0	768.5
NWBH2A (Neighborhood 2)	340	486.9	102.6	306.1	622.9
NWBH2A (Neighborhood 3)	340	486.6	131.0	272.9	945.9
NWBH1A (Neighborhood 1)	340	388.8	178.5	0	716.2
NWBH1A (Neighborhood 2)	340	486.9	102.6	306.1	622.9
NWBH1A (Neighborhood 3)	340	449.4	125.9	252.4	945.9
RecipRatio	340	0.0035	0.0055	0.0002	0.0397

Table A.3: First Stage Estimations. Static model, two instruments

	N1	N2	N3	N1	N2	N3
GDPpc	3.3371***	3.9318***	3.7313***	3.2962***	3.8523***	3.6978***
Poverty	-13.4913***	-4.5041**	-9.1278**	-10.7107**	-3.5200**	-8.5365**
Foral	1.0169	-0.4308	-1.7385	0.7188	-0.5699	-1.8211
Ideology	7.8602**	1.2818	-6.2464	22.1093**	8.0247**	-2.4415
Ideology*Poverty					-2.7408**	-1.5537
Recipiency Ratio	1472.069**	-1100.542***	-2627.048***	1637.71**	-1023.643**	-2580.434***
Social Security Pensions	0.4218***	0.4319***	0.4919***	0.4180***	0.4323***	0.4917***
F test	9.94***	9.11***	9.91***	10.43***	8.96***	9.89***

Table A.4: First Stage Estimations. Static model, one instrument

	N1	N2	N3	N1	N2	N3
GDPpc	2.8440***	4.2706***	4.7135***	2.7654***	4.1454***	4.6126***
Poverty	-12.9492***	-4.6636**	-9.1321**	-10.6326**	-3.4564**	-7.9616**
Foral	2.6886***	-1.7623***	-4.7783***	2.5990***	-1.8182***	-4.8351***
Ideology	10.0219**	0.0000	-9.4986**	21.8265**	8.2887**	-1.8536
Ideology*Poverty				-5.1066*	-3.3250**	-3.0752
Social Security Pensions	0.4425***	0.4176***	0.4522***	0.4413***	0.4192***	0.4532***
F test	9.22***	9.08***	14.39***	9.52***	9.02***	14.38***

Table A.5: First Stage Estimations. Panel Corrected Standard Errors Model

	Two instruments						One instrument		
	N1	N2	N3	N1	N2	N3	N1	N2	N3
GDPpc	3.3371***	3.9318***	3.7313***	3.3371***	3.9318***	3.7313***	2.8440***	4.270***	4.7135***
Poverty	-13.4913***	-4.5041**	-9.1278**	-13.491***	-4.5041**	-9.1278**	-12.949***	-4.6636**	-9.1321**
Foral	1.0169	-0.4308	-1.7385	1.0169	-0.4308	-1.7385	2.6886***	-1.762***	-4.7783***
Ideology	7.8602**	1.2818	-6.2464	7.8602**	1.2818	-6.2464	10.012***	0.0000	-9.4986**
Recipiency Ratio	1472.06**	-1100.54***	-2627.04***	1472.06***	0.4319***	-2627.04***			
Social Security Pensions	0.4218***	0.4319***	0.4919***	0.4218***	-1100.54***	0.4919***	0.4425***	0.417***	0.4522***
F test	9.94***	9.11***	9.91***	9.94***	9.11***	9.91***	9.22***	9.08***	14.39***