4-1-2019

Welfare Benefits in Highly Decentralized Fiscal Systems: Evidence on Interterritorial Mimicking

Luis Ayala
Universidad Rey Juan Carlos, luis.ayala@urjc.es

Ana Herrero
UNED, aherrero@cee.uned.es

Recommended Citation

INTERNATIONAL CENTER FOR PUBLIC POLICY

Welfare Benefits in Highly Decentralized Fiscal Systems: Evidence on Interterritorial Mimicking

Luis Ayala
Ana Herrero
Jorge Martinez-Vazquez

Georgia State University

ANDREW YOUNG SCHOOL
OF POLICY STUDIES

Welfare Benefits in Highly Decentralized Fiscal Systems: Evidence on Interterritorial Mimicking

Luis Ayala
Ana Herrero
Jorge Martinez-Vazquez

International Center for Public Policy
Andrew Young School of Policy Studies

The Andrew Young School of Policy Studies was established at Georgia State University with the objective of promoting excellence in the design, implementation, and evaluation of public policy. In addition to two academic departments (economics and public administration), the Andrew Young School houses seven leading research centers and policy programs, including the International Center for Public Policy.

The mission of the International Center for Public Policy (ICePP) at the Andrew Young School of Policy Studies is to provide academic and professional training, applied research, and technical assistance in support of sound public policy and sustainable economic growth in developing and transitional economies.

ICePP is recognized worldwide for its efforts in support of economic and public policy reforms through technical assistance and training around the world. This reputation has been built serving a diverse client base, including the World Bank, the U.S. Agency for International Development (USAID), the United Nations Development Programme (UNDP), finance ministries, government organizations, legislative bodies, and private sector institutions.

The success of ICePP reflects the breadth and depth of its in-house technical expertise. The Andrew Young School's faculty are leading experts in economics and public policy and have authored books, published in major academic and technical journals, and have extensive experience in designing and implementing technical assistance and training programs. Andrew Young School faculty have been active in policy reform in over 40 countries around the world. Our technical assistance strategy is not merely to provide technical prescriptions for policy reform, but to engage in a collaborative effort with host governments and donor agencies to identify and analyze the issues at hand, arrive at policy solutions, and implement reforms.

ICePP specializes in four broad policy areas:

- Fiscal policy (including tax reforms, public expenditure reviews, tax administration reform)
- Fiscal decentralization (including decentralization reforms, design of intergovernmental transfer systems, urban government finance)
- Budgeting and fiscal management (including local government budgeting, performance-based budgeting, capital budgeting, multi-year budgeting)
- Economic analysis and revenue forecasting (including micro-simulation, time series forecasting)

For more information about our technical assistance activities and training programs, please visit our website at http://icepp.gsu.edu or contact us by email at paulbenson@gsu.edu.

Welfare Benefits in Highly Decentralized Fiscal Systems: Evidence on Interterritorial Mimicking

Luis Ayala[1]   Ana Herrero[2]   Jorge Martinez-Vazquez[3]

April 2019

Abstract

This paper analyzes the determinants of welfare benefit levels within a highly fiscally decentralized context. More specifically, we analyze the role of mimicking 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 mimicking: regional public agents observe what their peers are doing and act accordingly, and this takes place even in a context of low mobility of households. 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 classification: H73, I38

[1] Ayala: Facultad de Ciencias Jurídicas y Sociales, Universidad Rey Juan Carlos, Paseo de los Artilleros s/n, 28032 Madrid, Spain | luis.ayala@urjc.es

[2] Herrero: Facultad de Derecho, UNED, C/ Obispo Trejo, 28040 Madrid, Spain | aherrero@cee.uned.es

[3] Martinez-Vazquez: International Center for Public Policy, Department of Economics, Andrew Young School of Policy Studies, Georgia State University, 14 Marietta Street NW, Atlanta, GA 30303, USA | jorgemartinez@gsu.edu

1. Introduction

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. This same literature has traditionally suggested that decentralization also boosts public policies innovation, if only because of the larger number of agents involved in the process.[1] One implication of fiscal federalism working as a public policy laboratory is that incumbents are expected not only to innovate but also to make their decisions taking into account what their neighbors are currently doing. Put simply, within a decentralized model, imitation becomes a cheaper way of finding best practices: governments observe what their peers are doing and decide to implement the most successful policies within their own territories.

One of the areas where mimicking 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).

---

[1] 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 inter-territorial interaction 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 been dedicated to examine the extent to which mimicking may have a role in welfare systems where there is neither federal funding nor federal coordination.

In addition, a different body of literature has studied the vertical interaction among different levels of government (federal and regional), which can affect the decisions made in each region. For example, vertical externalities have been extensively discussed in the context of multilevel taxation: larger tax rates set by one level of government might erode the tax bases available to higher or lower levels of government (Keen, 1998; Esteller-Moré and Solé-Ollé, 2001). However, in the case of welfare benefits, little is known so far about these possible interactions. One question is whether in the context of completely decentralized welfare schemes, regions might still consider the benefits set by the central government on other welfare issues, such as Social Security benefits, as a benchmark when determining their own welfare benefit levels.

The objective 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 intergovernmental interaction (mimicking) as a driver of the institutional design of those subnational government welfare policies in a context where there is neither federal policy co-ordination nor financing, that is, within a completely decentralized system. The basic question we want to analyse 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 are also interested in researching the extent to which regions in completely decentralized welfare systems use the benefit levels set by the central government (Social

Security pensions) 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 intergovernmental interaction 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 own resources. In summary, the analysis of the determination of welfare benefits at the Spanish regional level provides a novel unique opportunity to test the mimicking hypothesis within the context of what could be considered an "extreme model of decentralization".

To test the mimicking hypothesis, we first implement a two-stage-least-squares model that addresses the potential endogeneity problem of some of our covariates. Secondly, and in order to tackle the inertia that usually affects budgetary variables, we run a dynamic (Panel Corrected Standard Errors) model. Our empirical results lend strong support to the mimicking 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 mimicking in welfare benefits is fulfilled not only in frameworks where there is federal coordination but also in contexts of complete decentralization of these policies. And this occurs not only in frameworks in which governments fear to attract poor households when implementing more generous anti-poverty policies, but also in the context of low mobility of households, as is the case of Spain. Therefore, our results point to the fact that inter-territorial interactions take place not only due to the mobility of households, but also due to other reasons, as for example, strategic behavior toward potential voting outcomes, or perhaps even straightforward learning processes. 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 even 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 intergovernmental mimicking 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 diverse 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.

The last resort of the safety net consists of the Minimum Income programs of each of the regional governments (ACs). Potential claimants can apply for these benefits only if they have used up entitlement to the other benefit programs. All households below a given income threshold set by each region may be eligible for these programs. Eligibility conditions are restricted to an upper age limit (65 years of age, at which age claimants can benefit from the national non-contributory pension scheme) and a lower age limit (25 years of age, except for claimants with dependent children). Along with these requirements, and in order to prevent the formation of fictitious family units solely aimed at receiving the benefit, households must have been formed for a defined period before claiming that benefit. Another legal requirement is that of being officially registered in the corresponding region as a resident, although both national citizens and non-citizens are eligible. Most programs tax 100% of other social benefits as well as earned incomes. However, some regions have introduced exceptions to encourage labor market participation, such as the compatibility of earnings and benefits during some months, or the decision not to consider specific means-tested benefits for elderly household members in determining household benefits. In most regions, benefits are granted for one year, automatically renewable.

These regional welfare schemes have played 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 an extreme or radical fiscal federalism model of social assistance. As previously mentioned, regional governments in Spain created and regulated

6

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 (eligibility), the benefit levels, the temporal limits, and all other aspects of the programs. This setup resulted in striking differences in regulations and outcomes. When analyzing the institutional design, we observe highly diverse levels of protection, even larger than the ones observed in truly federal countries.[2]

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 poverty thresholds.[3] 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 percent in 2015. However, this average value hides a great diversity of practices. 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, especially with a marked difference between benefit levels.

Figure 1 illustrates how much the level of benefits differs across Spanish regional programs. These differences widen considerably as the size of the household receiving the

---

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

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.

It is not clear what the true drivers of that diversity are. 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] Casual evidence would seem to suggest that the especially favorable financing system enjoyed by 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] However, it is important to remark that, 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 package 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

---

[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.

affirm that the current diversity of regional expenditure is a direct 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 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 respectively. 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 also 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 have strategic behavior for different reasons. For example, they can implement fiscal competition in order to induce factor mobility and attract resources residing in other jurisdictions (Solé-Ollé, 2003; Allers and Elhorst, 2005; Besley and Case, 1995; Bordignon et al, 2003; Johnson, 2014) or they might want to stimulate some factors (for instance, poor households) moving to other jurisdictions. Strategic behavior might also occur when incumbents feel that citizens will evaluate their performance in relative terms to what their neighbor governments are doing. (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). Inter-territorial influence can also occur due to the existence of epistemic networks, which facilitate information exchange and boost imitation.

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 due to the generosity of welfare benefits causes a race-to-the-bottom 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.[6] This is more in line with what we are expecting to find in the Spanish case, since Spanish poor households are extremely immobile, but in spite of that 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

---

[6] Brueckner (1998) surveyed the empirical evidence on welfare migration, concluding that while the evidence is mixed policymakers act as if welfare migration is a significant phenomenon.

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 (Social Security pensions) as a benchmark when determining their own welfare benefit levels.

3.2. A basic model for inter-territorial mimicking in social welfare policies

As stated above, mimicking is based upon "informational" externalities among neighbouring jurisdictions that are mainly channelled through epistemic networks. Within a decentralized context, territories imitate each other under this process of finding best practices through innovation.

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. Formally, consider a set of *N* jurisdictions, in each of which there are identical taxpayers (r_i) and identical non-taxpayer individuals who are recipients of the welfare program (c_i). 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):

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

where x_i 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 gross income and R_i is the ratio of beneficiaries as a proportion of taxpayers in the jurisdiction ($R_i = c_i / r_i$).

As shown by Revelli (2006), given this constraint, utility maximization gives rise to a function for welfare expenditure —using the standard log-linear specification[7]— given by:

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

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:

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

where θ_{in} are the weights corresponding to the neighboring jurisdictions and λ represents the government´s 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 imitation 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).

---

[7] For the sake of simplicity, we adopt here one of the simplest classes of demand functions.

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 the 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 regions, but also an additional term accounts for how the welfare benefits in each jurisdiction may be affected by changes in other social benefits (such as Social Security pensions) that are set by the central government. If this assumption of vertical interdependence holds, [4] becomes

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

where g is the benefit level defined by the central government for other social benefits. In our specification of [5], the central government sets social security pensions in period $t-2$. Neighbours of region i set their respective welfare benefits in period $t-1$, taking into account pensions determined by the social security. And, finally, region i decides its own welfare benefits in period t, conditional on what its neighbours did in the previous year.

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 may 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. While there may be an endogeneity problem in relation to welfare expenditure, it is not so clear that this would be the case when the focus is on the benefit level. Jurisdictions can implement different strategies to reduce poverty in their territories simultaneously extending different parameters of the programs. In the case of regional welfare programs in Spain, the empirical evidence shows that when the objective is minimizing poverty, both the benefit level and the relative number of beneficiaries increase (Ayala, 2015).

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 this question, 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 different benefit levels targeted to specific types of households 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 those who do not have any income– corresponding to single persons (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[8]; 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 ($RecipRatio_{it}$).

- Mimicking (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

---

[8] Pro-redistribution preferences were assessed based on the information provided by the "Opinión Pública y Política Fiscal" (Public Opinion and Fiscal Policy) poll implemented each year by the Spanish Center of Sociological Research (CIS). Based on the answer to the question "What are taxes used for?", we used the percentage of people answering "They are a tool to better distribute wealth within our society" as a proxy of the regional willingness to implement redistribution policies.

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 be using 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 ("N1" 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 ("N2" in our estimations). In this case, we are assuming that a multilateral surveillance process takes place, may be through the existence of epistemic networks. 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).[9] After establishing which regions influence each other, we will follow the most usual approach in the literature and construct a matrix of welfare benefits in t-1 with the same weight for each neighbor ($\sum NWB_{it-1}$).[10]

- Vertical externalities: here we use the average Social Security´s pensions payed (by the central government) in each territory (*Pension*_{it-2}) in t-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

---

[9] According to this criterion, regions were clustered into four groups: 1) Madrid and the Basque Country, with a GDP per capita over 30.000 Euros; 2) Aragón, Catalonia and Navarre, with a GDP per capita between 25.000 and 30.000 Euros; 3) Asturias, Balearic Islands, Cantabria, Castile-Leon, Valencia, Galicia and Rioja, with a per capita GDP between 20.000 and 25.000 Euros; and 4) Andalusia, Canarias, Castile-La Mancha, Extremadura and Murcia, whose GDP falls below 20.000 Euros.

[10] We also used a "placebo" neighborhood in order to test the validity of our three neighborhood criteria. By randomly attributing fictious neighbors to both archipelagos we found that the statistical results did not point to a mimicking process, while the three real ones did point to the same kind of strategical behavior (although with different intensities).

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. As commented above, 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.[11]

In order to address the endogeneity problem, 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 as an instrument in the auxiliary instrumental equation [7]:

$$WB_{it} = \beta_0 + \beta_1 GDPpc_{it} + \beta_2 X_{it} + \beta_3 \sum_{j \neq i} N\widehat{WB_{jt-1}} + \beta_4 Pensions_{it} + \beta_5 RecipRatio_{it} +$$

$$\mu_i + \delta_t + \varepsilon_{it} \qquad [6]$$

$$\sum_{J \neq \iota} \widehat{NWB_{Jt-1}} = \alpha_0 + \propto_1 GDP_{jt} + \propto_2 X_{jt} + \propto_3 Pensions_{jt} + \propto_4 RecipRatio_{jt} + u_{jt}$$

$$[7]$$

where $\sum_{j \neq i} N\widehat{WB_{jt-1}}$ represents the matrix including the neighbors´ welfare benefits in t-1, μ_i are the fixed effects, δ_t are the temporal effects, and ε_{it} and u_{jt} represent the respective error terms. 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.

After analyzing the determinants of regional welfare benefits from a static perspective, we check the robustness of the results by running a dynamic model that will separately address the influence of neighbors´ policies and any existing inertia. To do so, we

---

[11] 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.

use a dynamic approach (Panel Corrected Standard Errors model) that includes the lag of the

dependent variable as a regressor, therefore controlling for the inertia effect of welfare

benefits implemented in the previous year:

$$WB_{it} = \beta_0 + \beta_1 WB_{it-1} + \beta_2 GDPpc_{it} + \beta_3 X_{it} + \beta_4 \sum_{j \neq i} \widehat{NWB_{jt-1}} + \beta_5 Pensions_{it} +$$

$$\beta_6 RecipRatio_{it} + \mu_i + \delta_t + \varepsilon_{it} \ [8]$$

where μ_i represents the unobservable heterogeneity, δ_t are the temporal effects, and ε_{it} is the

error term. The Panel Corrected Standard Error model separately addresses the inertia of our

dependent variable by estimating a composite error term (ε_{it} in [8]) that includes both an

autoregressive vector and the usual random walk, that is:

$$\varepsilon_{it} = \alpha_1 WB_{it-1} + \mu_{it} \qquad [9]$$

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

Table 1 shows 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 as an

instrument. We test for endogeneity with the Hausman test and, after that, we check that

Social Security pensions fulfill the two basic requirements to be used as instruments: first,

they need to be orthogonal to our dependent variable, and second they need to be relevant

(with explanatory power). Regarding the former, we know that welfare benefits are not

contingent on Social Security pensions payed in neighboring jurisdictions. As for the

relevance, we observe in Table A.3 in the Appendix that Social Security pensions in

neighboring territories have explanatory power over welfare benefits in those regions, with statistical significance and the expected positive sign.

After testing for endogeneity, all estimations point to the presence 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. Meanwhile, the recipiency ratio shows a positive relationship with benefits reinforcing the previously mentioned idea of a simultaneous use of the coverage and the generosity of the program to achieve the corresponding poverty reduction goals.

The results for the first stage (auxiliary) equation also point to the existence of vertical externalities: average Social Security pensions payed by the central government 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).

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" in welfare policies 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). The greater fiscal autonomy those two regions enjoy, together with their low

contribution to inter-territorial solidarity funding, allows them relatively higher resources and which they choose to use in part to implement much more generous welfare benefits.[12]

Note that our poverty variable does not have a very stable behavior within the model, probably due to the high correlation with GDP. However, when significant (under N3), "Poverty" displays a positive sign. A similar problem seems to apply to the ideology variable. 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 N1. Table 2 shows the results of an econometric specification identical to the previous ones but including this interaction term. In this case, all results are very similar to the ones obtained under the first specification of the model and poverty still displays a positive sign under N3, but not under N1 and N2.

Time effects have been addressed under two different strategies. First, year effects were included, but the results of the different specifications were not satisfactory.[13] When introducing a dummy variable that breaks the series into two periods (before and after 2010),[14] the specification displays the expected results, although as can be seen in Table 1, the two periods do not seem to be statistically different.

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 the

---

[12] Note that results for pro-redistribution preferences were not included in the tables. Although many specifications including this variable were tested, no statistical significance seemed to exist in any of them for this particular variable. We therefore decided to drop the variable from our estimations.

[13] Time effects were non-significant and collapsed the whole specifications. Those results were not included in the paper to save space, but are available from the authors under request.

[14] 2010 was the first year in which regional governments started suffering the loss of resources due to the economic crisis and was also the moment in which they were forced to implement budget cutbacks in order to fulfill the requirements of the excessive deficit protocol applied to Spain by the EU. Therefore, we could expect a change in regional strategies regarding welfare benefits after 2010.

static approach could be somewhat biased due to the strong inertia of the budgetary variables, in particular the level of welfare benefits.

In order to check the robustness of the results displayed above, we run a dynamic model that allows to disentangle the influence of neighbors´ policies and the role of inertia. As we have remarked above, in this specification, the lagged dependent variable is introduced as an additional regressor. Table 3 displays the results of the dynamic approach under a Panel Corrected Standard Errors model of estimation, with the same regressors used in Table 1.[15] The values of the Rho statistic (around 0.8) point to the existence of an autoregressive process, therefore validating the dynamic strategy.

Once again, we find evidence of the horizontal interdependence of welfare benefits at the Spanish regional level: neighbors´ benefits positively affect the amount of each region´s own welfare benefits. Furthermore, first stage estimations (see Table A.4 in the Appendix) point to the existence of vertical externalities, since Social Security pensions partly explain the level of benefits in neighboring jurisdictions.

In line with what we found under the static strategy, per capita GDP has a positive effect in the level of benefits, and so does the special institutional status of the foral territories. The recipiency ratio, once again, shows a positive influence on welfare benefits. While ideology is still not significant in any of the specifications shown in Table 3, poverty becomes significant and with a positive sign under the dynamic approach.

Table 4 shows the results obtained when an interaction term of poverty and ideology is also included as a regressor. The results basically reproduce the conclusions found under the previous static and dynamic specifications: regional governments observe what their neighbors are doing and then decide their own levels of welfare benefits. The level of

---

[15] We have run several System-GMM specifications in order to address the inertia of the dependent variable. However, we discarded them due to the instability of the results we obtained.

regional resources (GDP per capita and Foral variables) also has a positive influence on the relative generosity of benefits. Like in the previous dynamic specification, also in this case we obtain significant and positive coefficients regarding the poverty 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 mimicking 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 and continue to do so.

In this paper we use panel data for Spanish regions with the aim of answering one essential question: Does mimicking 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 interterritorial interactions. We find strong evidence of a mimicking behavior 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 also indicates the presence 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. (2015): "El gasto público en programas de lucha contra la pobreza: tendencias, determinantes y necesidades de reforma". *Papeles de Economía Española* 147, 145-66.

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. 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.

Appendix

Figure 1. Regional benefit levels (maximum benefit for each type of household)
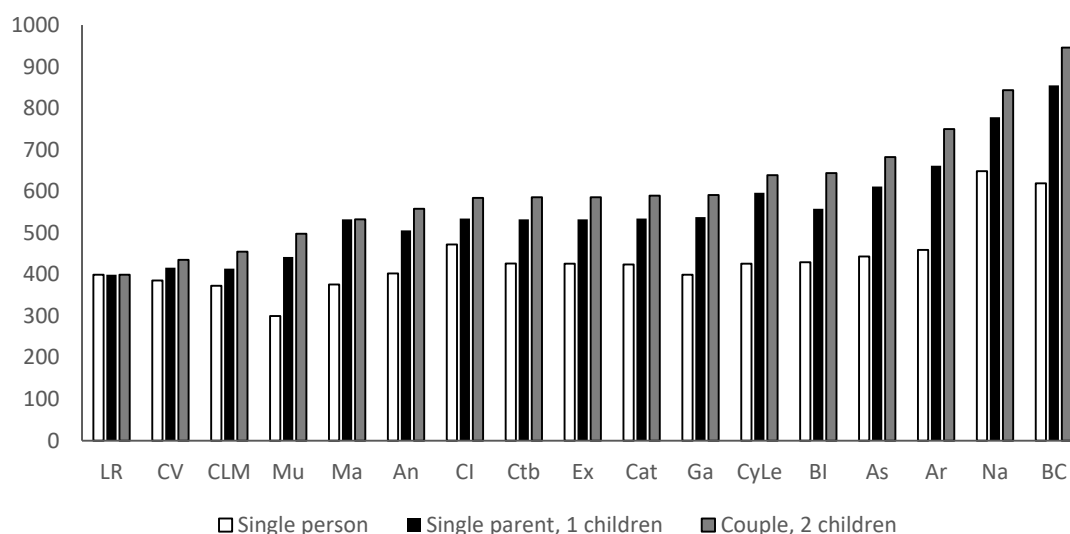
Table 1: Static approach. 2SLS [16]

	(1) N_1	Std.Errors	(2) N_2	Std. Errors	(3) N_3	Std.Errors
Endogenous Variable: Neighbors´ Benefit	0.509***	0.138	0.543***	0.154	0.305**	0.140
GDP pc	6.149***	1.895	5.637**	2.244	8.500***	2.276
Poverty	-1.571	3.112	2.649	3.315	6.531**	3.229
Foral	8.586***	1.246	10.601***	1.361	10.117***	1.481
Ideology	-6.634	5.315	0.325	5.008	2.355	5.710
Recipiency Ratio	1999.658**	816.80	2048.861**	776.0	2107.864**	865.388
Fixed Effects	Yes		Yes		Yes	
Time Effects	Dummy Crisis		Dummy Crisis		Dummy Crisis	
Endogeneity Test	0.81 (0.997)		0.14 (1.000)		1.04 [0.994]	
N	270		306		306	
Number of years	21		21		21	

Dependent variable: basic benefit received by an individual irrespective of the size of his/her own household.
Endogenous variable: neighbor´s basic benefit.
Instrument: average pension payed by the Social Security in each region.
N1: neighborhood 1 labels territories that share geographical borders as neighbors; N2: neighborhood 2 labels all territories as neighbors; N3: neighborhood 3 labels regions with a similar level of per capita income as neighbors.

---

[16] First stage estimations are displayed in the Appendix

Table 2: Static approach: 2SLS.

	(4) N_1	Std.Errors	(5) N_2	Std.Errors	(6) N_3	Std.Errors
Endogenous Variable: Neighbors´ Benefit	0.531***	0.140	0.542***	0.154	0.305**	0.140
GDP pc	6.049***	1.901	5.649**	2.237	8.498***	2.278
Poverty	-5.13	3.616	2.551	3.621	6.586*	3.570
Foral	8.973***	1.259	10.615***	1.380	10.109***	1.501
Ideology	-26.257**	10.997	-0.347	9.895	2.712	10.836
Poverty*Ideology	8.533**	4.142	0.273	3.495	-0.145	3.806
Recipiency Ratio	1747.17**	833.751	2040.53**	782.797	2112.01**	871.983
Fixed Effects	Yes		Yes		Yes	
Time Effects	Dummy Crisis		Dummy Crisis		Dummy Crisis	
Endogeneity Test	0.84 [0.997]		0.14 [1.000]		1.04 [0.000]	
N	270		306		306	
Number of Years	21		21		21	

Dependent variable: basic benefit received by an individual irrespective of the size of his/her own household.
Endogenous variable: neighbor´s basic benefit.
Instrument: average pension payed by the Social Security in each region.
N1: neighborhood 1 labels territories that share geographical borders as neighbors; N2: neighborhood 2 labels all territories as neighbors; N3: neighborhood 3 labels regions with a similar level of per capita income as neighbors.

Table 3: Dynamic approach: Panel Corrected Standard Errors

	(7) N_1	Std.Errors	(8) N_2	Std. Errors	(9) N_3	Std.Errors
Endogenous Variable: Neighbors´ Benefit	0.625***	0.130	0.724***	0.138	0.458***	0.121
GDP pc	2.940**	1.439	2.347	1.566	3.089*	1.899
Poverty	9.383***	2.779	5.866**	2.219	9.183***	2.377
Foral	68.225**	26.562	73.033**	31.615	65.494**	27.097
Ideology	-0.855	5.623	-0.906	4.563	6.486	4.70
Recipiency Ratio	3023.18**	1131.70	4473.65***	1051.77	5323.03***	1056.929
Fixed Effects	Yes		Yes		Yes	
Time Effects	Dummy Crisis		Dummy Crisis		Dummy Crisis	
Rho	0.810		0.861		0.796	
N	270		306		306	
Number of Years	21		21		21	

Dependent variable: basic benefit received by an individual irrespective of the size of his/her own household.
Endogenous variable: neighbor´s basic benefit.
Instrument: average pension payed by the Social Security in each region.
N1: neighborhood 1 labels territories that share geographical borders as neighbors; N2: neighborhood 2 labels all territories as neighbors; N3: neighborhood 3 labels regions with a similar level of per capita income as neighbors.

Table 4: Dynamic approach: Panel Corrected Standard Errors

	(10) N_1	Std.Errors	(11) N_2	Std. Errors	(12) N_3	Std.Errors
Endogenous Variable: Neighbors´ Benefit	0.632***	0.130	0.740***	0.127	0.456***	0.114
GDP pc	2.891**	1.416	2.218*	1.382	2.926*	1.770
Poverty	9.163**	3.124	6.489**	2.483	10.633***	2.739
Foral	68.690**	26.640	74.057**	29.134	66.453**	25.714
Ideology	1.275	11.509	8.921	8.881	20.265**	9.317
Recipiency Ratio	2981.07**	1140.88	4542.08***	1026.55	5434.93***	1031.69
Ideology*Poverty	-0.254	4.268	-3.086	3.177	-4.560	3.573
Fixed Effects	Yes		Yes		Yes	
Time Effects	Dummy Crisis		Dummy Crisis		Dummy Crisis	
Rho	0.809		0.839		0.776	
N	270		306		306	
Number of years	21		21		21	

Dependent variable: basic benefit received by an individual irrespective of the size of his/her own household.
Endogenous variable: neighbor´s basic benefit.
Instrument: average pension payed by the Social Security in each region.
N1: neighborhood 1 labels territories that share geographical borders as neighbors; N2: neighborhood 2 labels all territories as neighbors; N3: neighborhood 3 labels regions with a similar level of per capita income as neighbors.

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.

	(1) N1	(2) N2	(3) N3	(4) N1	(5) N2	(6) N3
GDPpc	3.925***	5.766***	5.016***	3.935***	5.675***	4.985***
Poverty	-13.005***	-2.937**	-8.201**	-10.130***	-2.034	-7.591**
Foral	0.995	-0.661	-1.754	0.690	-0.789	-1.839
Ideology	8.127**	1.598	-6.145	22.659**	7.879**	-2.240
Ideology*Poverty				-6.377**	-2.554**	-1.594
Recipiency Ratio	1431.71**	-1281.57***	-2673.24***	1596.78**	-1208.23***	-2625.54***
Social Security Pensions	0.392***	0.345***	0.432***	0.386***	0.346***	0.432***
F test	9.98	11.67	10.11	10.49	11.53	10.10
	[0.000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]

Endogenous variable: neighbors´ basic benefits
Instrument: average Social Security Pension in neighbors´ territories

Table A.4: First Stage Estimations. Panel Corrected Standard Errors Model

	(7) N1	(8) N2	(9) N3	(10) N1	(11) N2	(12) N3
GDPpc	3.925***	5.766***	5.016***	3.935***	5.675***	4.985***
Poverty	-13.005***	-2.937**	-8.201**	-10.130***	-2.034	-7.591**
Foral	0.995	-0.661	-1.754	0.690	-0.789*	-1.839*
Ideology	8.127**	1.598	-6.145	22.659**	7.879**	-2.240
Recipiency Ratio	1431.716**	-1281.57***	-2673.24***	1596.78**	-1208.23***	-2625.547***
Social Security Pensions	0.392***	0.345***	0.432***	0.386***	0.346***	0.432***
Ideology*Poverty				-6.377**	-2.554**	-1.594
F test	9.98	11.67	10.11	10.49	11.53	10.10
	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]

Endogenous variable: neighbors´ basic benefits
Instrument: average Social Security Pension in neighbors´ territories