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Vertical Externalities Within Multi-Level Welfare Programs: Does Central Government Welfare Spending Crowd Out Regional Spending? [1]

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Abstract

This paper contributes to the existing literature on vertical externalities in fiscally decentralized settings by analyzing the impact of a quite unique experience in the vertical composition of welfare spending in a country. We study the reactions of subnational governments' spending in the transitioning from a context of complete decentralization of welfare benefits to another where a parallel central government program targeting the same population is implemented. Using data from Spanish regional and central welfare programs and the canonical model specification of multilevel government externalities, we find that regional governments reacted negatively to the introduction of the new central welfare benefits by significantly reducing their own welfare expenditures. However, this crowding-out effect is weaker in relatively richer regions and those headed by left-wing regional administrations.

Keywords: welfare, fiscal federalism, vertical externalities, subnational government behavior

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1. INTRODUCTION

In many countries, welfare cash benefits are designed with a certain degree of territorial decentralization and the cooperation of different levels of government is needed. Fiscal responsibility is shared between these various layers through different mechanisms. Among the most important ones, grant systems from the central government to regional governments stand out. The way these transfers are designed—whether through block grants or conditional grants with matching rates—can lead to different types of incentives on regional spending.

The different potential grant formulas can affect the relative price for subnational new recipients and an extensive literature has tried to estimate these price elasticities (Orr, 1976; Gramlich; 1982; Moffitt, 1990; Shroder, 1995; Chernick, 1998; Ribar and Wilheim; 1999). While results vary widely depending on the estimation strategy, these studies suggest that regional welfare spending is generally highly responsive to grants from the central government. Although most of this literature has focused on the United States, research conducted in other countries also seems to corroborate that grants from the central government mitigate the marginal costs of subnational welfare spending (Toolsema and Allers, 2014). Similar results have been found for regional in-kind spending programs (Bundorf and Kessler, 2022; Leung, 2022).

Extending this literature, Baicker (2005a) showed that there are two margins along which regional governments can adjust their welfare spending, and thus two relevant marginal prices: they can adjust both the benefits that each recipient receives (intensive generosity), and the number of recipients through eligibility requirements (extensive generosity). The aggregate effect of those two dimensions would lead to the overall

generosity or spending effort of the welfare programs. An overarching empirical result in the previous literature is that conditional matching grants, as compared to block grants, exert a more significant impact on regional welfare spending (see Baicker, 2005a, and Ziliak, 2016, for a review). Although the final effect will depend on the price elasticity of demand for benefits, a potential consequence is that the transition from conditional matching rates to block grants could lead to a degradation in welfare benefits (Ayala et al. 2022). Lowering the matching rate impacts regional welfare spending through both a substitution effect and an income effect. The substitution effect suggests that, even in the scenario where a block grant of equivalent magnitude replaces a matching grant, the expected effect would be a reduction in regional spending.

Hence, it is possible to predict the outcomes on regional welfare spending in response to different types of transfers from the central government. Knowledge about regional spending behavior is much more limited, however, when there are no transfers or other explicit cooperation agreements among the various levels of government. For instance, what happens to regional spending when a central government welfare program comes to coexist simultaneously with other programs managed by regional governments, with different regulations, but essentially targeting the same population? What would be the expected effects on regional spending of creating a national welfare program in a previous context of complete decentralization of these programs?

The latter scenario is precisely the case with cash welfare benefits in Spain. Until 2020, the Spanish last safety net was made up of a variety of regional minimum income programs. These benefits, which were created in the early 1990s, were designed and financed by the Spanish regional governments, with no central coordination or co-

funding of any kind. As a result of different regional sensitivities to income distribution issues and also of large differences in the availability of public resources, regional benefits followed a divergent path for several decades.

With the outbreak of the COVID pandemic, the Spanish central government announced the creation of a new national welfare program that would assist households suffering from severe poverty. Thus, for the first time, a minimum income program with nationwide coverage was launched. The new program, termed the "Minimum Living Income" (IMV) provides benefits like those representing the last stage of the safety net in other European countries. It is a benefit aimed at preventing the risk of poverty and social exclusion of people who live alone or are integrated in a cohabitation unit and lack economic resources to cover their basic needs. Using different scales according to household typologies, it provides greater protection to single-parent households and children, and its coverage is indefinite as long as the reasons for its award continue to exist. The available evidence so far shows that the adequacy level of the IMV is higher than the average level of the preexisting regional programs (Ayala et al. 2022).

This paper contributes to the existing literature on fiscal federalism by analyzing the impact of a singular experience in which both the central government and regional authorities develop simultaneously similar instruments for protecting poor households without explicit coordination. The Spanish initiative to create a national minimum income benefit to alleviate severe poverty after the outbreak of the pandemic is a unique experience of a welfare policy that was exclusively in the hands of regional governments and which ended up working in parallel with a centralized system targeted to the same group of population.

Anecdotal evidence shows that most Spanish regional governments have reacted by changing their respective welfare packages after the new national program was launched. As stated in the law by which it was implemented, the IMV is a "floor" benefit, potentially compatible with the benefits that the regions may grant as minimum income. With the creation of a national program, regional governments had essentially three options: to supplement the IMV by providing coverage to households not covered by the national program (e.g., irregular immigrants, persons below the age limit, households that do not meet one of the requirements, etc.), to complement the IMV by adding to the national benefit an additional amount paid by the regional government, or to make their own benefits incompatible with the central one. In practice, some regions—Andalusia and the Balearic Islands—have engaged in this last subsidiary behavior, while other regions have chosen to complement the benefit paid by the central government. In general, the reactions of the various regional governments appear to have been heavily influenced by the difference between the amount of their benefit and that of the central government. Most regions that had basic benefits below the IMV at the time of its implementation have intensively reduced their spending. Meanwhile, the regions whose benefits were larger than the IMV have reduced it to a lower extent. This multilevel policy framework and range of reactions fits into the classical case of vertical externalities within multilevel finance systems: the behavior of one level of government changes the behavior of other upper or lower-level governments (Besley and Rosen, 1998; Anderson et al., 2004; Böhringer et al., 2016).

The paper attempts to disentangle the changes in regional behavior after the introduction of the national Minimum Income program was launched. Using the canonical model applied in the previous literature on multilevel government externalities, we find that

regional governments reacted negatively to the introduction of the national benefit by reducing their overall level of welfare generosity. This effect was mainly triggered by a reduction in the extensive margin with the generosity of the programs for access to potential claimants becoming more stringent. However, this reduction has been weaker in relatively richer regions, which can afford more ambitious programs, and those regions led by left-wing governments. Regarding the welfare programs´ generosity or intensive margin, most regions have tried to avoid being less visible in front of their constituencies by raising their benefit levels.

All in all, our results suggest that, after a period of quite a static regional behavior, an exogeneous shock such as the launch of the national welfare program has triggered different reactions among regional governments, with generally crowding-out effects on the extensive generosity of regional programs. These results are robust to different specifications and estimation models.

Our results are also relevant to the literature on the optimal design of anti-poverty programs. While most of that literature has focused on the advantages and disadvantages of decentralizing benefits—such as welfare migrations or problems of interregional inequality—, the question of what happens to the adequacy and coverage of regional benefits when a similar national program is launched may offer new insights into the design of these programs. Our analysis can also bring lessons for other countries reforming their welfare systems. While the Spanish central government's intention was not to replace regional programs but rather to reinforce them, our results show that the central government's expectations were far from being fulfilled. In retrospect, without a minimum coordination level with regional governments or a more formal design

involving for example a matching conditional grant to regional governments, the crowding out outcomes would seem to have been inevitable.

The rest of the paper is structured as follows. Section two synthesizes the most important elements of the Spanish welfare institutional framework. Section three reviews the relevant literature on the devolution of redistribution policies and on the presence of horizontal and vertical externalities in multilevel systems of finance. In section four we develop the main hypotheses. Section five discusses the data and the estimation approach. In section six we present the empirical results. Section six concludes.

2. THE SPANISH WELFARE INSTITUTIONAL FRAMEWORK

The last stage of the social protection system in Spain is a set of benefits that represent a final income resort of support for people with insufficient or no income at all: non-contributory pensions, social assistance unemployment benefits, regional minimum income programs, and the new IMV. The corresponding benefit levels depend on the economic situation of the recipient unit and the established maximum limit. Access to the regional programs is conditioned in many cases to participation in a personalized process of labor market insertion to avoid disincentives to seek employment. The aim is to offer a basic level of protection for the duration of the situation of economic need.

Given the lack of initiative of the central government, and the assignment of welfare competences to the regional governments in the Spanish Constitution, the first minimum income program at the regional level was created in the Basque Country in 1989, inspired in the French model of 'minimum insertion income' (RMI). In the following years, similar programs were generalized in the rest of the Spanish regions. In the second half of the 1990s, when all the regions already had a minimum income program, several studies

showed that, given the considerable heterogeneity of the regional programs, it was unrealistic to speak of a Spanish common minimum income policy (Aguilar et al., 1995; Ayala, 2000).

The differences in coverage among potential claimants and in the general levels of protection were very large and gave rise to important problems of interregional equity (Ayala and Bárcena-Martin, 2018). Before the 2008 crisis, RMI programs only reached 17 per cent of people below the poverty line, and of those, one third of the recipients belonged to the Basque program, with the Basque region representing only 4.6 percent of the total population of Spain. With the persistence of the Great Recession, the heterogeneity of the regional programs increased, as did the conditions for access or its duration, coinciding with intense general budget cutbacks in some regions. These issues of interterritorial inequality made greater coordination and participation in financing by the central government even more necessary than in the previous period.

Table 1. Differences in regional minimum income programs

	Expenditure per inhabitant (euros)		Recipients/ 1000 inhabitants		Benefit level (euros)	
	1996	2023	1996	2022	1996	2023
Andalusia	3.38	8.65	1.47	2.04	241.61	468.00
Aragon	2.43	3.27	0.94	5.77	198.33	621.00
Asturias	7.41	53.51	1.39	12.83	249.48	461.72
Balearic Islands	1.19	14.58	0.77	3.08	245.61	491.63
Canary Islands	4.49	27.37	1.93	7.58	180.30	565.37
Cantabria	0.83	31.59	0.93	7.20	213.36	480.00
Castile-La Mancha	2.55	1.15	1.24	0.38	234.11	648.00
Castile and León	3.24	4.74	1.32	2.04	180.30	480.00
Catalonia	4.19	56.34	1.37	7.12	234.39	717.10
Extremadura	1.18	17.57	0.63	4.92	189.32	600.00
Galicia	3.28	11.59	1.82	3.72	213.84	469.20
Madrid	4.14	1.23	1.56	0.99	238.21	469.93
Murcia	1.22	4.47	0.48	1.73	216.36	480.00
Navarre	4.72	123.47	2.89	26.02	245.21	716.31
Basque Country	19.69	147.06	7.65	29.30	243.41	800.11
La Rioja	1.20	14.10	0.96	4.64	235.60	480.00
Valencian Community	1.73	56.49	0.93	10.40	249.48	723.19
TOTAL	4.18	30.52	1.69	6.01	224.06	568.92

Source: Own making based on *El Sistema Público de Servicios Sociales* (Ministerio de Derechos Sociales y Agenda 2030).

As Table 1 shows, the differences in the resources invested by the different regional programs have been very wide. The region that allocates the largest budget to minimum incomes (the Basque Country) spends more than 120 times per capita than the regions that allocate the least resources (Castile-La Mancha and Madrid). The differences in the coverage of the programs are also very large, with three regions clearly above the average (Basque Country, Navarre and Asturias) and others well below (Madrid and Castile-La Mancha). Huge differences also arise in the benefit levels provided by each program,

giving rise to very different protection against the poverty risk. Madrid and Galicia stand out as the communities with the lowest basic amount, well below the average, in clear contrast to the amounts paid in Catalonia, Navarre, the Basque Country and the Valencian Community.

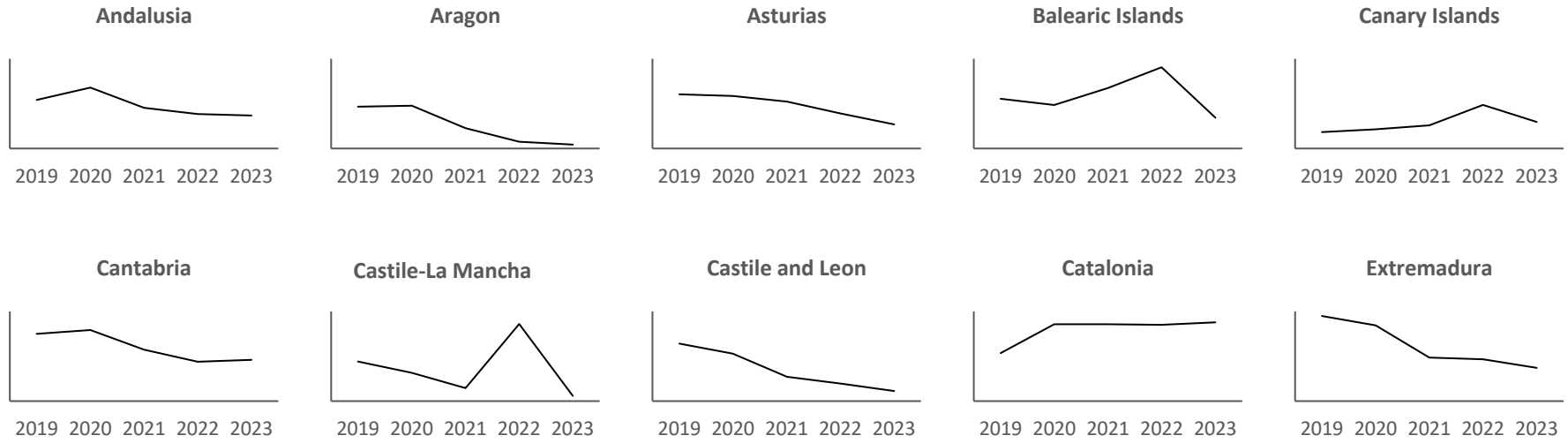
Thus, until the IMV was launched, the safety net in Spain was a territorially fragmented system, with vastly different levels of protection for similar situations of need and very unequal coverage of the poor population. Additionally, there were other deficiencies, such as the lack of articulation of benefits other than regional minimum incomes, such as non-contributory pensions or various unemployment subsidies, significant gaps in the coverage of some risk groups, and high levels of administrative complexity that impinge limited access to benefits for economically vulnerable households.

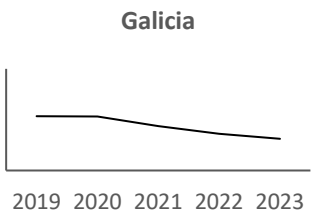
The need to extend the income guarantee system to cover the rapid increase in poverty due to the pandemic, together with the more general goal of addressing some of existing deficiencies, led the central government to create the IMV in 2020. The IMV is a monthly cash benefit intended to cover the gap between the household's total income and the guaranteed income. The new program opens a completely different scenario, since a large part of the needs that were covered by regional programs are now also covered by the central government. As stated in the presentation of the IMV Law, the result of the regional programs had been significant heterogeneity in access to social benefits for people in need, many of whom remained inadequately covered by the welfare state, requiring a model of shared governance.

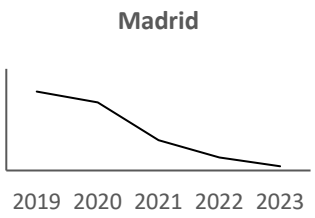
The central government's expectation was that most regions would take advantage of their powers to complement the IMV by leveraging the resources previously spent on their

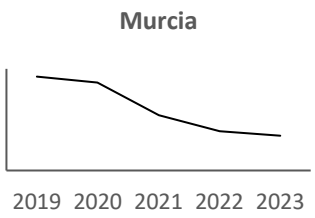
programs. The new national program was created as a way to complement and to expand benefits. However, as we already have pointed out, it did not establish mechanisms for coordination with regional governments. Given the heterogeneity in the objectives of these governments—varying sensitivity to redistribution, cost-saving, use of programs as a symbol of regional identity, and so on— the central government's expectation that regional governments would expand the coverage of their programs was in retrospect unrealistic. In fact, there seems to have been little awareness that the central government's new program could trigger a process of crowding out of some of the regional programs.

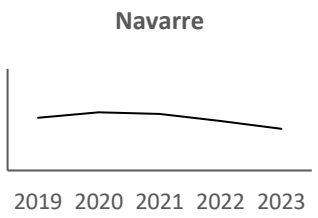
Figure 1. Regional minimum income programs, changes in expenditure 2019-2023

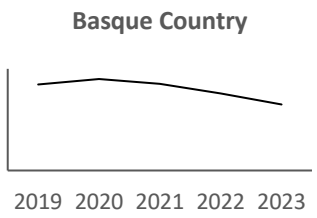


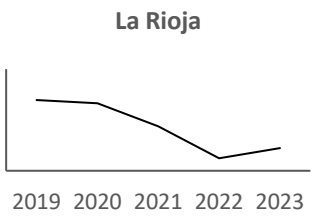

Galicia
2019 2020 2021 2022 2023

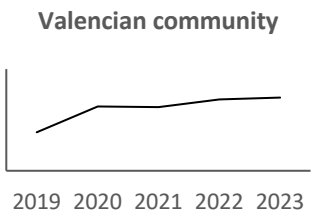

Madrid
2019 2020 2021 2022 2023


Murcia
2019 2020 2021 2022 2023


Navarre
2019 2020 2021 2022 2023


Basque Country
2019 2020 2021 2022 2023


La Rioja
2019 2020 2021 2022 2023


Valencian community
2019 2020 2021 2022 2023

The reactions of the regional governments have been heterogeneous as shown by the different patterns followed by expenditure levels (Figure 1). Although the most common pattern has been a reduction, some regions have followed the opposite trend, such as the Canary Islands, Catalonia, and the Valencian Community. In other regions, changes have been minor, as in Navarre and the Basque Country. Note that in some cases the cut led expenditures to minimal levels, implying the almost practical disappearance of some regional programs. Thus, contrary to the central government expectations, the implementation of the national program would have contributed in many cases more to containing rather than expanding overall welfare expenditure.

The decline in expenditure levels is primarily due to a decrease in the number of recipients of regional programs, although with some variations among regional programs. In 11 out of the 17 regions, there has been a remarkable decrease in the number of families receiving the regional welfare benefit, approaching zero in some communities, such as Madrid and Castile-La Mancha. This common pattern in the declining number of recipients contrasts with what happened with the benefit levels. These latter have increased in all regions since the national program was first implemented.

These descriptive data seem to indicate that the overall response of the regional governments to the new central IMV program was to increase benefit levels but to also introduce more restrictive eligibility criteria in their regional programs.

3. REDISTRIBUTION WITHIN MULTILEVEL SYSTEMS: WHO ASSISTS THE POOR?

The question of how lower levels of government react to changes in a similar program by the central government invites us to review what the incentives of the

former are or what their possible strategies could be. This section first offers a synthesis of the literature on the determinants of regional welfare benefits, and then reviews the literature on the externalities that can be triggered by the behavior of one level of government on the behavior of other levels or units of government.

The literature on the determinants of regional social spending is large. Social, economic, geographic, cultural and institutional characteristics have been identified as explanatory factors of the level of welfare benefits implemented at the regional level in different countries (Castles, 1989; Cutler et al, 1993; Falch and Rattsø, 1997; Fernández and Rogerson, 1997; Di Mateo and Di Mateo, 1998; Herrero and Tránchez, 2017). Most subnational spending is influenced simultaneously by demand and supply conditions, and by the national and subnational institutional framework.

Regarding the specific demand for welfare programs, larger shares of regional expenditure can be expected when poverty levels are higher (Ayala et al. 2021). Another characteristic that can drive the generosity of welfare benefits is the prevalence of inequality aversion in each territory. From the median voter´s perspective, the impact of the average regional income can also explain the willingness to implement welfare policies. According to Wagner´s Law, the generosity of these policies would be larger in jurisdictions with higher incomes.

Since we are analyzing welfare benefits, and not the provision of in-kind services, the most important conditioning factor from the supply perspective would be the level of fiscal resources. The larger the level of public income, the larger benefits can be expected (Ayala et al. 2021). Other factors such as the size of each

jurisdiction or population density, which tend to influence subnational in-kind spending, seem to be less relevant in the case of cash benefits.

The institutional framework can be also critical in the determination of welfare spending. Previous literature has analyzed the impact of incumbent´s ideology, government´s fragmentation, regional government´s alignment with the central administration, or federal regulations on the level of subnational spending. Left-wing incumbents and coalitions have been found to spend more, while there is no clear evidence of the influence of other mentioned institutional characteristics (Herrero and Tránchez, 2017; Ayala et al, 2021).

A third body of literature has analyzed the existence of externalities or potential influence of other public administrations´ behavior on the level of subnational taxing and spending (Boadway et al., 1998; Besley and Rosen, 1998; Esteller-Moré and Solé-Ollé, 2001; Besley and Coate, 2003; Brülhart and Jametti, 2004; Madiés et al., 2004; Grazzini and Petretto, 2015; Böhringer et al., 2016; Martínez-López, 2018). These externalities can be either horizontal or vertical: in the former case, decisions made by one territorial unit influence decisions made by other units at the same level of government; in the latter, policies implemented by the central government affect the behavior of other levels of administration, or the other way around (Wildasin, 1991; Keen, 1997; Keen and Kotsogiannis, 2002;).

Research on the externalities triggered by tax changes is also quite large (Keen, 1997; Keen and Kotsogiannis, 2002; Dahlby and Wilson, 2003;). Regarding welfare programs, the previous literature has analyzed subnational governments´ strategic behavior according to their neighbors´ level of welfare benefits

(Schroder, 1995; Berry et al., 2003; Baicker, 2005b; Fiva and Rattsø, 2006; Dahlberg and Edmark, 2008).

Closer to our interest in this paper, another line of research has analyzed the vertical externalities generated by changes in federal programs on subnational welfare systems (Ribar and Wilhelm, 1999; Chernick, 1998, 2000; Baicker, 2005a; Marton and Wildasin, 2007; Toolsema and Allers, 2014). A large share of this research has focused on the changes of behavior at the state level in the US after the federal government discontinued a system of matching grants that co-financed a fix share of the states´ welfare benefits, and substituted it with a block-grant system, providing a fix amount for each State. While with the former system both price and income-effects were present, with the latter there only was an income-effect. Ribar and Wilhelm (1999) showed evidence of a small but positive income-elasticity of subnational welfare benefits, while the price-elasticity seemed to be very small or even nil. Using the changes in the federal matching rate schedule during a longer time period, Baicker (2005a) estimated elasticities not biased by the endogenous relationship between income, spending, and federal contributions, to find that states´ behavior is quite sensitive to federal grants. In any case, the move from matching to block grants triggered a race to the bottom in the states´ welfare programs (Ayala et al. 2022).

4. THEORETICAL FRAMEWORK

The creation of the national welfare program in Spain could be expected to have effects on several elements of the regional governments´ behavior. As we have seen above, multiple determinants of regional social spending have been found in the previous literature, including social, economic, geographic, cultural, and institutional characteristics, as well as the actual incidence of poverty levels and

the amount of available fiscal resources. Depending on the balance of those different forces, several alternative reactions could follow.

These potential reactions of regional governments to the implementation of a similar benefit by the national government can be formalized through a simple model. Let us consider a set of N jurisdictions, in each of which there are individual taxpayers (T_i) and non-taxpaying individuals who are recipients of the welfare program benefit (R_i). In any given jurisdiction i, total population is $N_i=T_i+R_i$.. We can assume that the goal of the government of that jurisdiction is to maximize a utility function with the following arguments:

$$U_i = U(c_i, e_i; x_i) \quad [1]$$

where c_i is individual consumption, e_i is the jurisdiction's welfare expenditure per recipient and x_i is a vector of socioeconomic characteristics in jurisdiction i that may also affect utility, including a variety of social, economic, and institutional characteristics. The budget constraint in jurisdiction i can be expressed as:

$$y_i = c_i + P_i B_i \quad [2]$$

where y_i is income per capita, P_i is the ratio of welfare recipients as a proportion of taxpayers in the jurisdiction ($P_i = R_i / T_i$) and B_i is the benefit level per recipient.

As shown by Revelli (2006), given this constraint, utility maximization in jurisdiction i gives rise to a function for welfare expenditure—using a standard specification[2]—that can be expressed as:

$$e_i = \alpha x_i + \beta y_i + \gamma P_i + \varepsilon_i \quad [3]$$

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

This function can be expanded by considering other dimensions that may affect welfare expenditure. For instance, we can assume that welfare policies in other territories may influence voters, and consequently incumbent politicians. In that case, equation (3) needs to be extended to include the welfare expenditure levels in the neighbouring jurisdictions. The impact of neighbours' welfare policies on the expenditure level in jurisdiction i can be modelled as a weighted average of neighbouring jurisdictions' expenditures:

$$e_i = \alpha x_i + \beta y_i + \gamma P_i + \delta \sum_{i=1}^{j} \theta_{in} e_n + \varepsilon_i \qquad [4]$$

where θ_{in} are the weights corresponding to the neighboring jurisdictions and δ represents the government´s response function to welfare designs in those territories. 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.

Still this same framework can be used to incorporate the change in the price of new recipients resulting from the participation of the central government in the financing of the benefits. And here we can differentiate among the two margins along which regional governments can adjust: the benefits that each recipient receives, and the number of recipients, changing the budget constraint in jurisdiction i to:

$$y_i = c_i + (R_i/Ti)\, sB_i \qquad [5]$$

where again y_i is per capita income, c_i is individual consumption, T_i is the size of non-poor population (taxpayers), and s is the fraction of benefits B paid by the regional government, $s=S(B,Y)$. We assume first that welfare benefits are decentralized, and that central and subnational governments share these costs, but, also as in the Spanish case, we allow for an extreme scenario in which welfare

is completely decentralized and all the costs resulting from an increased number of recipients will correspond to regional governments.

If the regional goal is to choose a benefit level and the number of recipients that maximize $U_i = U(y_i, B_i, R_i; x_i)$, the first-order condition is (Baicker, 2005a):[3]

$$\frac{\frac{\partial f}{\partial R}}{\frac{\partial f}{\partial B}} = \frac{sB}{R\left(a + \frac{\partial s}{\partial B}B\right)}$$

This result indicates that the marginal rate of substitution between broadening eligibility criteria and enhancing benefit levels equals the marginal cost of including an additional recipient relative to the marginal cost of augmenting benefit levels by one unit. Governments have the flexibility to alter benefit levels, adjust recipient rates, or implement both strategies to regulate welfare expenditure. The extent to which regional governments make use of one of these strategies depends on different factors, including macroeconomic conditions or periods of limited budgetary resources.

In the case of regional governments in Spain, the great singularity within this framework is that until the implementation of the central IMV, the fraction of benefits B paid by the regional government was s=1. With the new centralized government benefit, there is an implicit change in s, which could even become zero if the amount of the new benefit is greater than that of the regional government and recipients can move—or even are forced to move—from the regional to the national program. That depends on whether there is a need to choose between one of the two benefits because they are mutually exclusive, or if

[3] As in Baicker (2005a), we make no assumptions about the form of the utility function. Other authors have considered Stone-Geary utility functions in the analysis of welfare programs (Hoynes, 1996).

both can be compatible. The purpose of the central government was to establish a benefit that would serve as a baseline and therefore be compatible, while regional governments could complement that baseline if they wanted, by providing higher levels of protection. In practice, some regional governments opted for complementarity while others chose exclusivity.

In terms of equation [4], an additional term can account 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:

$$e_i = \alpha x_i + \beta y_i + \gamma P_i + \delta \sum_{i=1}^{j} \theta_{in} e_n + \rho IMV + \varepsilon_i \qquad [6]$$

where *IMV* is the benefit level defined by the central government for its new program.

Within this framework, the introduction of a national (complementary) benefit for poor households can have both an income and a substitution effect. Regarding the latter, regions can try to maintain total income relief (central + regional) at the same level that existed before the introduction of the national program. In this case, regions can be expected to reduce their level of expenditure and the number of welfare recipients. The simplified theoretical framework allows us to derive the following hypotheses:

H1: The central government´s welfare program crowds out overall regional welfare generosity.

A second implication is that, after the introduction of a national benefit, regional governments seek to remain visible to their citizens, and in order to prevent the

national benefit to completely absorb their programs, they increase their benefit levels:

H2: The national welfare program increases intensive-margin regional welfare generosity.

H3: Since recipients can be diverted to the central program, the central government´s benefit crowds out extensive-margin regional welfare generosity.

Due to the significant variations in the initial generosity of welfare programs across different regions, the implementation of a nationwide initiative aimed at guaranteeing a minimum income is expected to yield diverse outcomes, contingent upon those initially existing levels of benefits. As most regions may try to bridge the disparity between their minimum income and the IMV, we anticipate varied responses based on the magnitude of this disparity:

$$e_i = \alpha x_i + \beta y_i + \gamma P_i + \delta \sum_{i=1}^{j} \theta_{in} e_n + \rho IMV + \tau(IMV - B_i) + \varepsilon_i \qquad [7]$$

Last, to account for such a heterogeneous behavior, we advance the following hypothesis:

H4: The larger the difference between the IMV and the initial regional benefit (at the moment of deploying the national program), the greater the sensitivity of regions´ level of welfare expenditure and number of welfare recipients.

5. EMPIRICAL ANALYSIS

5.1. Main variables and data

Our analysis focuses on three different dependent variables which are used to test hypotheses 1 through 4 above. First, we analyze the impact of the creation of the national IMV program on the level of welfare expenditure per capita (overall

generosity). Second, we study the impact of the national program on the size of basic benefits, which are those obtained by a qualified household with only one individual (intensive-margin generosity). Finally, we estimate the effect of the program on the share of recipients on the total regional population (extensive-margin generosity).

For the potential explanatory variables to include in the estimations, we have selected the following, based on our model and the findings in the previous literature:

- Our variable of interest, IMV, is a dummy with a value of 1 in the years in which the national welfare program has been in place (2020-2023), and 0 otherwise.[4]
- On the "demand side", we use *Poverty* as a proxy of the overall demand for regional welfare programs. This is measured as the share of households suffering from severe poverty (no income households) calculated using the microdata from the Labor Force Survey. An increase in the share of poor households is expected to increase expenditure; however, the impacts on the number of recipients and the level of benefits are ambiguous, depending on the regional governments´ budget restriction.
- On the "supply side," our goal is to capture the main supply conditions of poverty relief programs, and for that purpose we rely on a general proxy for the regional governments´ budget constraint: regional GDP per capita. We address the singular regional financing system of the charter regions in Spain (with additional revenue sources) by including the dummy variable *Foral*. Potential further financial restrictions are captured by the variable *Debt stock*, that measures the ratio of regional debt to regional GDP.
- We also control for the effects of some institutional characteristics: first, the presence of a redistributive ideological bias among regional governments is captured by a dummy variable (*Ideology*) that takes the value of 1 for left-wing governments, and 0 otherwise; second, we try to capture nationalist regional governments attempts to differentiate themselves from the central government with an additional dummy (*Nationalist*). Some regional governments could decide to compete with the central government by increasing their program expenses much more to make the voters visualize regional policy leadership. We also include an interaction term of regional GDP with governments´ ideology.

[4] Similar results are obtained when using the level of the basic benefit offered by the national program instead.

- In the equation for welfare basic benefits (intensive-margin generosity), we control for the potential influence of other territories´ policies in the determination of regional benefits by including the variable *Neighbors´ Benefits*. This variable is approached in a simple way, assuming that all regions in Spain are neighbors whose policies may be mimicked. [5] Therefore, the corresponding value for region *i* is obtained as the average of all regional benefits, excluding region *i*.
- Last, we control for the presence of temporal effects with two different variables: first, we introduce a dummy variable for the pandemic (with a value of 1 in 2020, and 0 otherwise, since that was the year in which the largest macroeconomic shock took place), and second, we include a dummy variable for the *Great Recession* years to address the potential structural change of the series when severe austerity measures were implemented at all levels of government in Spain.

The descriptive statistics for the variables to be used in the estimations below and a description of each of them and their respective sources are shown in Table A.1 in the Appendix.

5.2. Estimation approach

To identify the potential vertical externalities imposed by the Spanish national welfare program on the Spanish regional level of welfare expenditure (overall generosity), we adopt two complementary econometric strategies. First, a static analysis is implemented using a fixed-effects panel data approach, spanning from 1996 to 2023, with the following specification:

$$Exp_{ij} = \propto_0 + \alpha_1 IMV_j + \propto_2 Demand_{ij} + \propto_3 Supply_{ij} + \propto_4 Ideology_{ij}$$

$$+ \propto_5 Nationalist_{ij} + \alpha_6 Time_j + \varepsilon_{ij}$$

where Exp_{ij} denotes the level of welfare expenditure per capita in region *i* in year *j*; *IMV* represents the national welfare benefit in year *j*; $Demand_{ij}$ captures the effects of welfare benefits demand conditions—poverty levels—; $Supply_{ij}$ captures the effects of each region´s supply conditions—level of regional resources proxied

[5] Ayala et al. (2021) show that this is a valid approach for addressing neighbors´ influence in the determination of regional welfare benefits.

by GDP per capita, the special financial regime of the two charter regions and regional debt to GDP—; $Ideology_{ij}$ reflects the potential redistributive bias of left-wing governments; $Nationalist_{ij}$ identifies potential heterogeneous behavior of regional nationalist parties; and $Time_j$ captures time effects.

Since our dependent variables are expected to have strong inertia, the coefficient of the variables obtained for the fixed effects model could be biased. Thus, a complementary dynamic model is also estimated to separately capture this inertia. For this purpose, we use a panel corrected standard errors model, with the following specification:

$$Exp_{ij} = \propto_0 + \propto_1 Exp_{ij-1} + \alpha_2 IMV_j + \propto_3 Demand_{ij} + \propto_4 Supply_{ij} + \propto_5 Ideology_{ij} + \propto_6 Nationalist_{ij} + \alpha_7 Time_j + \varepsilon_{ij}$$

where Exp_{ij-1} represents regional benefits in region *i* in year *j-1*.

The specifications used to estimate the other two dependent variables (intensive margin and extensive margin generosity) are basically the same, although the one used to analyze the determinants of regional basic benefits includes $Neighbors´benefits_{ij}$ as an additional exogenous variable to capture potential horizontal mimicking processes.

6. EMPIRICAL RESULTS

6.1. Expenditure

Table 2 displays the results obtained for the fixed effects panel data model (static approach) and for the panel corrected standard errors model (dynamic approach) regarding the explanatory factors of regional welfare programs´ overall generosity. Once time effects are included in the specification, what we find here is that the deployment of the IMV triggered a negative reaction of regional

governments in terms of welfare expenditure. We therefore find empirical support for the crowding out effect expected in hypothesis 1: regional governments retrench their welfare spending after the central government also gets involved in addressing poor citizens´ basic needs. And this is also true when we use a dynamic model which separately captures the autoregressive pattern of the data through the Rho coefficient.

Table 2. Expenditure per capita

	Fixed effects panel data				Panel Corrected Standard Errors		
	1	2	3	4	5	6	7
IMV	0.085	-0.673	-1.990*	-1.510	-2.326	-2.116*	-1.845*
Poverty	7.528***	2.708**	4.002***	3.439***	1.673**	0.513	0.935
GDPpc	1.212***	0.983***	1.381***	0.800**	0.795	0.793**	2.129***
Foral	6.488***	7.930***	7.764***	7.587***	65.851***	81.044***	49.278***
Ideology	-0.078	-0.064	0.074	-0.740**	2.719	4.446***	5.501***
Ideology*GDPpc				0.501***			
Nationalist Gov.	-0.626**	-0.711**	-0.715**	-0.499	2.249	3.393	2.832
Pandemic			7.971**				7.258***
Great Recession			-7.619***				-2.255
Debt stock		0.738***	0.536***	0.684***		1.150	0.951***
Rho					0.899	0.899	0.744
R-sq:					0.1238	0.2113	0.5500
Within	0.6902	0.7260	0.7426	0.7384			
Between	0.7322	0.7239	0.7270	0.7592			
Overall	0.6988	0.6974	0.7056	0.7248			
F	26.96***	35.65***	37.51***	29.62***			
Wald Chi²					27.23***	77.84***	527.45***
N	476	391	391	391	476	391	391

***, **, *Statistical significance at the 0.01, 0.05 and 0.10 levels, respectively. All estimates include country fixed effects.

Regarding the rest of the explanatory variables, we find that poverty levels, used as a proxy of citizens´ welfare needs, have a positive impact on the level of expenditure, as expected. On the supply side, the results suggest that relatively richer territories and those with more revenues available are able to afford more generous programs, since the coefficients for both GDP per capita and *Foral* are

statistically significant and have a positive sign. The ratio of debt to regional GDP displays significant and positive coefficients, showing that the more indebted territories are the ones spending the most. Thus, regional indebtedness does not appear to work as a financial constraint in the implementation of regional welfare programs. This may be explained by the small share of regional spending these policies absorb.

As for the *Ideology* variable, the static approach points to an interaction with GDP, suggesting that only richer territories with left-wing governments implement more generous welfare programs. However, the dynamic model captures a general positive effect of ideology on the level of expenditure. The variable capturing the presence of a nationalist party in the regional government displays either the opposite sign to the one we anticipated (static approach) or non-significant coefficients (dynamic approach).[6]

6.2. Benefit levels

The general reduction in regional welfare expenditures after the implementation of the central government´s IMV could be triggered by different strategies: subnational governments could modify either their benefit levels, the requirements to qualify for the benefit—making them more stringent—, or both. Regarding the former, our hypothesis 2 states that the introduction of the national welfare program forced regional governments to increase their intensive generosity levels, to prevent the national program from completely absorbing their benefits and therefore losing visibility in front of their constituencies. Table

[6] There are two distinct groups of regions with nationalist governments,: the foral regions (Navarre and the Basque Country), which for many years promoted these programs as a hallmark of their government's action, and Catalonia and the Canary Islands, which have maintained low levels of spending and benefits for a long time.

3 shows strong evidence of this kind of behavior, since our dummy variable IMV displays positive and significant coefficients in most of the specifications. More importantly, this effect persists after we capture the inertial behavior of benefit levels within the dynamic model.

Regional poverty displays a positive significant sign in the simplest specifications, but this effect disappears after we account for temporal effects. This could be due to the idea that when it comes to benefit levels, poverty does not account for regional expenditure needs as much as the cost of living. However, after replicating our analysis by including regional purchasing power parity, this variable did not have any explanatory power either.

Regarding our supply variables, both GDP per capita and *Foral* have strong explanatory power and the expected positive sign. Once again, we find empirical evidence that relatively richer territories and those with more revenues available can afford to have more generous welfare programs.

The analysis of the impact of institutional variables in regional minimum income programs with the fixed effects panel data model points to a positive effect of both left-wing and nationalist subnational governments. However, this effect only persists for the variable *Ideology* after we account for inertia in the dynamic model.

Table 3. Basic benefit

	Fixed effects panel data				Panel Corrected Standard Errors			
	1	2	3	4	5	6	7	8
IMV	22.221***	12.647***	15.066***	12.682***	25.469***	12.368**	10.466**	3.098
Poverty	25.285***	6.057*	0.689	-0.502	9.657***	4.006	2.590	1.550
GDPpc	14.779***	11.875***	11.204***	9.505***	10.2445***	7.871***	11.339***	3.847***
Foral	6.830***	7.941***	8.157***	8.187***	83.578***	121.422***	7.934***	7.900***
Ideology	1.527**	2.017***	1.335**	1.291**	6.580	9.466	0.941*	0.915**
Nationalist Gov.	4.354***	3.360***	3.493***	3.485***	3.134	6.227	1.473	1.450
Pandemic			34.388***	29.560***			19.769**	4.844
Great Recession			30.116***	26.902***			16.396**	8.137**
Debt stock		3.369***	3.715***	3.385***		3.804***	3.590***	2.171***
Neighbors´ benefits				0.121				0.510***
Rho					0.8191	0.8130	0.677	0.712
R-sq:					0.2198	0.3267	0.6308	0.6363
Within	0.8381	0.8043	0.8301	0.8306				
Between	0.5682	0.6530	0.6552	0.6869				
Overall	0.7233	0.7231	0.7404	0.7647				
F	23.86***	14.73***	16.06***	11.06***				
Wald Chi^2					112.99***	105.04***	737.93***	1595.25***
N	476	391	391	391	476	391	391	391

***, **, *Statistical significance at the 0.01, 0.05 and 0.10 levels, respectively. All estimates include country fixed effects.

6.3. Number of recipients

If there has been an increase in regional benefits (intensive margin generosity) following the implementation of the Spanish national welfare program, any adverse effect on regional welfare expenditure (overall generosity) should therefore be attributed to a shift in the eligibility criteria for accessing regional programs (extensive margin generosity). We show evidence of this kind of effect in table 4. As stated in our hypothesis 2, an erosion in the number of regional recipients took place because a large share of them were diverted to the national program. This crowding out effect of the IMV on the share of regional recipients is robust to both the static and the dynamic specifications. Contrary to the government's expectations, the development of a national benefit did not drive an increase in the coverage of regional programs but rather a reduction in the number of recipients.

Regarding the control variables, once again, we find that larger levels of poverty, which reflect greater expenditure needs, have a positive and significant effect on the number of regional recipients. However, this effect fades out after we account for inertia in the panel corrected standard errors model.

Similarly to the previous specifications, GDP per capita and *Foral* display positive and significant coefficients, showing further evidence on the effect of greater affordability of welfare programs in relatively richer territories.

Regarding our institutional explanatory variables, *Ideology* has a positive effect on the number of regional recipients, suggesting that left-wing subnational governments deploy less stringent eligibility criteria in their welfare programs in comparison to those led by right-wing political parties. Moreover, the interaction

term of *Ideology* with GDP points to a more intensive effect in the case of richer territories with also leftist governments. Regional nationalist governments seem also to deploy less generous programs in terms of eligibility criteria, although this effect disappears after we control for inertia in the dynamic model.

Table 4. Recipients/1000 inhabitants

	Fixed effects panel data					Panel Corrected Standard Errors				
	1	2	3	4	5	6	7	8	9	10
IMV	0.082	-0.351*	-0.484**	-0.502**	-0.588***	-0.053	-0.288	-0.360	-0.509***	-0.560**
Poverty	1.550***	0.795***	0.911***	0.947***	1.018***	0.403***	0.226	0.187	0.140	0.171
GDPpc	0.258***	0.233***	0.204***	0.279***	0.245***	0.187**	0.146**	0.084	0.166**	0.151**
Foral	0.907***	0.996***	0.942***	0.978***	0.934***	12.4922***	14.665***	13.401***	0.987***	0.964***
Ideology	-0.003	0.015	-0.091*	0.032	-0.064	0.519	0.893**	-1.815	0.035	-0.283
Ideology*GDPpc			0.079***		0.069***			0.128*		0.045**
Nationalist Gov.	-0.148***	-0.159***	-0.125**	-0.159***	-0.130**	0.487	0.719	0.122	-0.059	-0.043
Pandemic				0.846	0.694				0.628	0.588
Great Recession				-0.894***	-0.716**				-0.202	-0.200
Debt stock		0.132***	0.123***	0.109***	0.106***		0.180***	0.186***	0.179***	0.179***
Rho						0.8463	0.839	0.838	0.712	0.677
R-sq:						0.1843	0.2509	0.2654	0.6380	0.6824
Within	0.6609	0.6603	0.6725	0.6689	0.6779					
Between	0.6919	0.6735	0.7142	0.6762	0.7117					
Overall	0.6781	0.663	0.6974	0.6711	0.6976					
F	29.62***	35.07***	29.39***	35.63***	29.80***					
Wald Chi^2						39.40***	72.84***	75.58***	424.83***	524.62***
N	459	391	391	391	391	495	391	391	391	391

***, **, *Statistical significance at the 0.01, 0.05 and 0.10 levels, respectively. All estimates include country fixed effects.

6.4. Heterogeneity in regional behavior

Given the substantial variability in the generosity of regional welfare programs, the introduction of a nationwide initiative ensuring a minimum income was likely to have diverse marginal effects, depending on pre-existing benefit levels. It is important to recall that regions were allowed to reconfigure their own programs in different ways: they could make their benefits incompatible with the central one, they could make them complementary (individuals´ central benefits are deducted from the regional ones) or they could make them compatible (both programs coexist independently and therefore regional benefits are calculated without accounting for the central ones). None of them used the latter strategy, while only two followed the first one. Since most regions are now covering the gap between their minimum income and the IMV, we can expect different marginal effects depending on the size of that gap. To capture this potential effect, we replicate the estimations for our extensive margin and intensive margin generosity dependent variables, including as an additional explanatory factor the gap between the regional and the national basic benefit (*IMV-MI Gap*).

The results for these new estimations, displayed in Table 5, offer strong support on the presence of heterogeneous behavior (hypothesis 4). The negative and significant coefficient of the *IMV-MI Gap* variable implies that, the larger the gap between the national and the regional benefit, the greater the sensitivity of subnational governments in retrenching their own programs by reducing the number of eligible recipients and the level of expenditure. Regions with a tradition of less generous welfare programs took advantage of the deployment of the national program to a larger extent. The cases of Madrid and Castile-La Mancha are particularly relevant, since their regional programs

have virtually disappeared. These results are robust to both the static and dynamic estimation approaches.

Table 5. Heterogeneity in regional behavior

	Fixed Effects Panel Data		Panel Corrected Standard Errors	
	Expenditure	Recipients	Expenditure	Recipients
IMV	7.497***	1.607***	7.527**	1.230**
Poverty	4.055***	0.959***	2.664**	0.353**
GDPpc	0.730*	0.134*	1.743***	0.085*
Foral	7.318***	0.878***	38.448***	0.8862***
Ideology	0.004	0.016	9.915***	0.004
Nationalist Gov.	-0.920***	-0.205***	5.636	0.024
Pandemic	21.238***	3.796***	20.114***	2.943***
Great Recession	-9.455***	-1.302***	-5.472***	-0.543
Debt stock	0.341**	0.065**	0.583***	0.073**
IMV-MI Gap	-0.056***	-0.012***	-0.056***	-0.009***
Rho			0.537	0.5905
R-sq:			0.6877	0.6121
Within	0.7500	0.6832		
Between	0.7462	0.7122		
Overall	0.7227	0.7008		
F	32.07***	30.09***		
Wald Chi^2			389.02***	354.20***
N	391	391	391	391

***, **, *Statistical significance at the 0.01, 0.05 and 0.10 levels, respectively. All estimates include country fixed effects

The overall result is, therefore, that among the various possible strategies that regional programs developed once a national program was created, the majority option has been to reduce their number of recipients and thus their expenditure. It follows from this experience that attempting to boost spending on decentralized welfare programs with the implementation of a national program without establishing explicit coordination mechanisms or co-financing formulas can lead to a significant crowding-out effect on existing subnational programs.

7. CONCLUSIONS

One of the most contemporaneous and relevant issues in the analysis of welfare policies in fiscally decentralized settings is the responses of subnational governments in the face of changes in central government's behavior. The most common and best-known reaction is the one triggered by changes in the financing system. If the central government´s reforms lead to a greater flow of resources towards subnational governments, the expected result is an increase in spending by the latter. The opposite is expected when changes at the central government level imply a lower endowment of resources for subnational governments.

However, these standard behaviors and responses may be constrained by other strategic considerations made by subnational governments. Taking advantage of the increased spending by the central government, subnational governments could choose to reduce the volume of resources allocated to the programs if they are perceived as substitutes of the central policies. In that case, the central government´s reform may not produce social welfare spending improvements, because dedicated total budgetary resources may not change. Alternatively, some regional governments could decide to directly compete with the central government by increasing their program expenses much more, so that, for example, voters can more accurately identify regional policy leadership.

Most of the literature that has tried to examine these behaviors has focused on the reactions at the state level in the US after the federal government discontinued a system of matching grants in which it co-financed a share of the states´ welfare benefits, and replaced it with a block-grant system. Although the results vary according to the type of specifications chosen for the estimations and the way in which possible endogeneity is

controlled for, the empirical evidence seems to point to a remarkable sensitivity of sub-national governments to changes in the implied cost of a new beneficiary into their programs.

Until now, however, there was no evidence of what the possible subnational government reactions are in a more atypical setting when transitioning from a fully decentralized welfare system to one where the central government starts providing welfare benefits. The recent reforms of welfare programs in Spain, which fulfill those latter characteristics, have allowed us to test what alternative strategic behaviors may be expected by the subnational governments. Moving from a completely decentralized system without any vertical or horizontal coordination of any kind, to a new system with the introduction of a central government program, regional governments had the option of developing different response strategies.

Our empirical findings strongly suggest that the new central benefit had, on average, a significant negative impact on the level of overall generosity (welfare expenditure) by Spanish regional governments. This effect seems to have been more intense in those regions with initially less generous welfare programs. In this case, subnational savings materialized mainly through the redirection of eligible potential recipients to the national program (reducing the extensive margin generosity of the regional welfare policy). In contrast, other regions decided not to let the national program completely absorb them.

These findings offer interesting insights into the vertical externalities generated by the launch of a central welfare program for poor households when subnational programs are already in place. After several decades of quite static regional behavior, the exogenous shock represented by the new national program triggered significant changes in regional

welfare policies. While a few regions attempted to compete with the central government by increasing their number of recipients, the overall general trend has been a reduction in spending and the number of households receiving regional benefits. In some cases, it would be fair to say that the new national program clearly crowded out the previously existing regional programs.

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Appendix

Table A.1. Main variables descriptive statistics and data sources

	N	Mean	Std.Dev	Min	Max	Definition	Source
Basic Welfare Benefit	476	389.401	118.742	180.3	800.1	Benefit received by qualified households with 1 individual	Ministerio de Derechos Sociales y Agenda 2030
Recipients	459	4.978	6.799	0.200	39.702	Number of recipients of the regional welfare program/1000 inhabitants	Ministerio de Derechos Sociales y Agenda 2030
Expenditure	476	22.407	39.536	0.364	224.873	Regional welfare expenditure per capita	Ministerio de Derechos Sociales y Agenda 2030
Neighbors´ Benefits (Average)	459	384.507	92.061	222.466	575.005	Average of Basic Welfare Benefit (excluding each region)	Own calculations
IMV	476	.142	.350	0	1	Dummy variable: 1 in years with IMV, 0 otherwise	Own elaboration
Poverty	476	2.549	1.055	0.364	7.15	Share of households with no market income	Labor Force Survey
GDP pc	476	20.955	5.767	7.766	36.431	Gross Domestic Product per inhabitant	National Accounts
Ideology	459	0.403	0.491	0	1	Dummy variable: 1 when left-wing incumbent, 0 otherwise	Own elaboration
Pandemic	459	0.035	0.185	0	1	Dummy variable: 1 in 2020, 0 otherwise	Own elaboration
Great Recession	459	0.481	0.500	0	1	Dummy variable: 1 after Great Recession, 0 otherwise	Own elaboration
Regional debt	391	14.164	10.306	1	48.5	Regional debt/GDP	Bank of Spain
Foral	476	.117	.322	0	1	Dummy variable: 1 for the Basque Country and Navarre, 0 otherwise	Own elaboration