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**(WHEN) ARE INTERGOVERNMENTAL TRANSFERS
USED TO BAIL OUT REGIONAL GOVERNMENTS?
EVIDENCE FROM SPAIN 1986-2001**

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(WHEN) ARE INTERGOVERNMENTAL TRANSFERS USED TO BAIL OUT REGIONAL GOVERNMENTS? EVIDENCE FROM SPAIN 1986-2001^{a,b}

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ABSTRACT: This paper analyses the main determinants of a central government's decision to use grants to bail out regional governments (i.e., the determinants of additional grants assigned by a central government to regions due to an increase in their issue of debt). The estimated grant equation is derived from a model of a federation, based on Goodspeed (2002), where regions are Stakelberg leaders and the central government's objective is to maximize a weighted sum of the welfare of the representative consumers from all the regions. The specified equation is estimated separately with a panel data set of discretionary and non-discretionary grants for 15 Spanish regions during the period 1986-2001, using the within and the GMM estimators (Arellano and Bond, 1991), respectively. The results show that the Spanish central government uses grants to partially bailout regions. Such fiscal rescue operations are more intense when: i) the region is responsible for providing health care; ii) debt limits exist (and they have not been properly designed); iii) regional voters are relatively indifferent between the incumbent and the challenger (i.e., there is a high proportion of swing voters).

Keywords: Intergovernmental grants, bailouts, political economy.

JEL codes: H1, H77, O4.

RESUMEN: Este trabajo analiza los determinantes de la decisión del gobierno central de utilizar transferencias para rescatar a los gobiernos regionales (i.e., los determinantes de las transferencias adicionales asignadas por el gobierno central debido a un aumento en la deuda de los gobiernos regionales). Las ecuaciones de transferencias estimadas se derivan de un marco analítico, basado en Goodspeed (2002), donde las regiones son Stakelberg líderes y el objetivo del gobierno central es maximizar la suma ponderada del bienestar de los consumidores representativos de todas las regiones. Estas ecuaciones se estiman separadamente para las transferencias discrecionales y las no discrecionales, con un panel de datos de las 15 Comunidades Autónomas (CCAA) de régimen común durante el período 1986-2001, utilizando el estimador intragrupos y el GMM (Arellano y Bond, 1991), respectivamente. Los resultados muestran que el gobierno central español utiliza las transferencias para rescatar parcialmente a las CCAA. Dicho rescate fiscal es más intenso cuando: i) la región es responsable de proveer sanidad; ii) existen límites sobre la deuda (y no han sido correctamente diseñados); iii) los votantes regionales son indiferentes entre el partido en el gobierno y el de la oposición (i.e. existe una elevada proporción de votantes indecisos).

Palabras clave: Transferencias intergubernamentales, rescate, economía política.

Clasificación JEL: H1, H77, O4.

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1. Introduction

In many decentralized countries, both developed and developing, subcentral governments are heavily indebted. These include regional governments in countries such as Brazil, Italy and Spain, with those in Argentina constituting the most salient case (Rezk, 1998). This is a highly pressing issue, given that the lack of fiscal discipline of subcentral governments has been identified as a major source of macroeconomic instability (IMF, 2005). The literature has provided an explanation for this behaviour based on the expectations held by subcentral governments that they will receive additional resources from debt issues. Such expectations can, however, weaken the fiscal discipline of subcentral governments and induce them into adopting a strategic use of debt. For instance, a subcentral government with expectations of being bailed out might decide to use debt rather than to make use of its tax autonomy to balance its budget constraint, since the former option has a lower (political and economic) cost.

A subcentral government is said to have a *soft budget constraint* when its expenditure is not fully covered by its revenue and it chooses to issue debt in the expectation of receiving additional resources from the central government (Kornai *et al.*, 2003). This designation of additional resources, termed a *bailout* (Wildasin, 1997), is most commonly achieved by the assignment of additional intergovernmental grants and can be either explicit or implicit. In an explicit bailout, the central government provides a supplementary grant to the subcentral government facing financial difficulties to ensure that it can carry out its responsibilities¹. Such bailouts may come with or without conditionalities. In an implicit bailout, the central government provides an additional amount from existing grants to a subcentral government because of its use of debt. In this paper, we focus on the existence and determinants of implicit bailouts.

Theoretical analyses (e.g., Carlsen, 1998; Goodspeed, 2002; Inman, 2003) and the evidence from a number of case studies, including the USA (Inman, 2003), Canada (Bird and Tassonyi, 2003) and Hungary (Wetzel and Papp, 2003), indicate that fiscal decentralization *per se* does not necessarily weaken the fiscal discipline of subcentral governments. The effect of fiscal decentralization on subcentral governments' fiscal discipline is conditioned by the institutional arrangements regarding intergovernmental fiscal relations. Specifically, this effect depends on whether the institutional environment generates for subcentral governments expectations of being bailed out (Rodden *et al.*, 2003).

¹ The central government might also assume some of the subcentral governments' liabilities or a share of their debt.

In the first place, to be able to implement a bailout, some discretion by the central government in the allocation of resources among subcentral governments is needed (Rodden, 2001; Oates, 2005). The literature emphasises the fact that, when regional governments are responsible for providing a key public service, such as health care or education, it is difficult for the central government not to bail them out when they face financial difficulties (Rodden *et al.*, 2003; Bordignon and Turatti, 2005). Likewise, an absence of subcentral fiscal autonomy (over taxes, expenditure or borrowing) can also induce the central government to bail regions out, since they lack the instruments to make a fiscal adjustment (von Hagen and Eichengreen, 1996). The number of people living in the region can affect this decision too. According to the “*too big to fail*” hypothesis (Wildasin, 1997), the larger the population in a region is, the greater the probability of it being bailed out, since the negative externalities caused by the financial difficulties affect a higher share of the population. The political characteristics of the regions can also affect the central government’s bailout decision, as it is shown latter on.

A number of empirical studies have examined the effects of bailouts on subcentral fiscal discipline². Petterson-Libdon (2007) estimates the effect of the expectations of being bailed out on the fiscal discipline of Swedish municipalities for the period 1979-1992. He proxies these expectations by the explicit bailout grants received by neighbouring municipalities and reports that such an expectation increases local public debt by 20%. Bordignon and Turatti (2005) estimate the effect of bailout expectations, proxied by political characteristics, on regional public health care expenditure for the Italian regions during the period 1990-1999. They also find that such expectations expand this expenditure. Garcia-Milà *et al.* (2001) show that, for the period 1984-1995, the amount of additional grants expected by Spanish regions, proxied by the share of regions in terms of population³, generates higher levels of regional public debt. By contrast, Lago (2005) empirically analyses the determinants of Spanish regional deficits for the period 1984-1996, and concludes that they are not due to bailout expectations, but rather to the lack of regional financial autonomy.

The aim of this paper is to provide empirical evidence on whether the central Spanish government uses grants to implicitly bail out regional governments during the period 1986-2001 and, if so, to examine the determinants of such a decision. To the best of our knowledge, this

² See Besfamille and Lockwood (2007) for a theoretical approach to this issue.

³ They develop a model in which they consider aggregate bailouts, i.e., the central government cannot increase the grants allocated to one region, but rather it has to increase the grants assigned to all regions. These additional grants are distributed in proportion to each region’s population. Thus, expectations of bailout are proxied by the regions’ share of population.

issue has yet to be addressed empirically. Spain is a particularly well suited institutional environment to this study as it is experiencing an ongoing process of decentralization, gradually introduced over time, and characterised by significant differences across the regions. Today, regional public expenditure accounts for approximately 40% of overall public expenditure. During the period analysed there was a substantial increase in the issue of public debt by regional governments. And although the lion's share of their resources comes from formula-based grants, there is still substantial room for discretion in their distribution. Spanish regions have experienced considerable variation in their fiscal autonomy; and, moreover, they are responsible for providing basic public services, such as health care and education, having assumed such responsibilities at different points in time. These characteristics, in addition to others that are outlined in detail below, present differences across regions and in time and, thus, help us to identify the existence and determinants of implicit bailouts⁴.

In this paper, we first establish a basic framework for analysing the existence and determinants of subcentral government bailouts based on Goodspeed (2002). This model provides an equation that identifies the main determinants of the distribution of grants among subcentral governments, including the issue of debt by subcentral governments. Secondly, this equation is estimated with a panel data set for the Spanish regions during the period 1986-2001. We find that Spanish regions are partially bailout by the central government and that the bailout is more prevalent when: i) the region is responsible for providing health care; ii) there are debt limits (and they have not been properly designed); iii) regional voters are relatively indifferent between the incumbent and the challenger (i.e., there is a high proportion of swing voters).

The rest of the paper is organized as follows. In the second section we introduce a simple model of grant allocation among regions. In the third section we briefly describe the main characteristics of the intergovernmental relationships in Spain, identifying the reasons why the Spanish central government might use grants to differentially bail out regions. The data base and econometric procedures are also discussed in this section. The results are presented in the fourth section. Finally, the last section summarises the main conclusion of this analysis.

⁴ From hereon in we use the term *bailout* to refer solely to implicit bailouts since, in Spain, there is no grant whose specific purpose is to *explicitly bailout* regions in financial difficulties.

2. Analytical frameworks

The natural way to model the bailout decision is in terms of a sequential game (Carlsen, 1998; Goodspeed, 2002; Inman, 2003). The central government makes a no-bailout claim. The subcentral governments assess the credibility of this claim and make their budgetary decisions accordingly. If they fail to find the central claim credible, they issue debt. In the final stage, the central government must decide whether or not to bail out subcentral governments. Its decision depends on the payoffs of each action. The benefits of refusing to provide fiscal rescue operations accrue in the future when the central government's no-bailout claim becomes credible and subcentral governments behave responsibly. The costs of not bailing out are immediate, since the welfare of subcentral governments falls below a desired level and this may have electoral consequences for the incumbent at the centre. This temporal gap between costs and benefits, together with the short period of time that politicians consider when taking their decision, reduces the credibility of the no-bailout claim.

In this paper, the basic framework for analysing the existence and determinants of regional governments' bailouts is based on the two-period inter-temporal model described in Goodspeed (2002). We consider a federation with one central government and two regional governments, indexed by $i=1, 2$. The population of region i is N_{it} , with $t=1, 2$ indicating the period of time. There is perfect information. Each individual in region i consumes C_{it} units of a private good and E_{it} per capita units of a public good provided by the regional government. The utility of the representative resident of region i depends upon its consumption of public and private goods in both periods and it is assumed to be concave, increasing and additively separable in each of its arguments. Hence, the utility of the representative individual takes the form:

$$W_i(E_{i1}, E_{i2}, C_{i1}, C_{i2}) = u_i(E_{i1}) + v_i(C_{i1}) + \rho u_i(E_{i2}) + \rho v_i(C_{i2}) \quad [1]$$

where ρ is the discount factor. The representative consumer of region i is endowed with Y_{it} units of income in each period. The provision of the public good is financed by a regional lump-sum tax, T_{it} , and a grant provided by the central government, G_{it} . In the first period, regions can issue debt, denoted by D_{i1} , to finance the public good provision. Thus, the budget constraints in the first period are:

$$E_{i1} = G_{i1} + T_{i1} + D_{i1} \quad \& \quad C_{i1} = Y_{i1} - T_{i1} \quad [2]$$

In the second period, the regional public debt must be null. Moreover, in the second period the central government's per capita grants, G_{i2} , must be completely financed by a central government lump-sum tax on consumers, T_2^C . Thus, the budget constraints in the second period are:

$$E_{i2} = G_{i2} + T_{i2} - (1+r)D_{i1}, \quad C_{i2} = Y_{i2} - T_{i2} - T_2^C \quad \& \quad \sum_i N_{i2} T_2^C = \sum_i N_{i2} G_{i2} \quad [3]$$

The objective function of regional governments is the welfare of the representative consumer (equation [1]), while the objective function of the central government is a weighted sum of the welfare of the representative consumers of all regions, which can be expressed as follows:

$$W = \sum_i \phi_{i1} W_{i1} + \rho \sum_i \phi_{i2} W_{i2} \quad [4]$$

where ϕ_{it} is the weight assigned to region i at period t . If the central government is benevolent, these weights will be the relative size of the region in terms of population ($\phi_{it} = N_{it} / \sum_k N_{kt}$). Nonetheless, there is theoretical (e.g. Cox and McCubbins, 1986; Lindbeck and Weibull, 1987) and empirical (e.g. Case, 2001, Dahlberg and Johansson, 2002; Solé-Ollé and Sorribas-Navarro, 2007) evidence showing that the goal of the central government is to maximize not only social welfare, but also its own welfare, thereby ensuring its maintenance in power. Thus, ϕ_{it} can also take into consideration the political characteristics of the regions.

The timing of the game is as follows. Before the game starts, central government decides the distribution of grants for period one between regions, G_{11} and G_{21} . Regional governments are Stackelberg leaders and, in the first period, simultaneously determine their taxes, T_{i1} , and borrowing, D_{i1} . Each regional government takes the other regional government's choice as given. In the second period, central and regional governments move simultaneously. The former chooses the regions' level of grants for the second period, G_{12} and G_{22} , to maximize W subject to budget constraints (equations [2] and [3]), taken as given T_{i1} and D_{i1} . Regional governments decide their taxes, T_{i2} , and as there is perfect information, they take into account the reaction function of the central government, G_{i2}^* , when deciding their debt level in the first period. Hence, regional government i chooses T_{i1} , T_{i2} and D_{i1} to maximize W_i subject to the budget constraints (equations [2] and [3]) and the reaction function of the central government,

$G_{i2}^*(1+r)$. To solve the game by backward induction, the central government's problem is solved first⁵.

Central government bailout decision. The first order conditions of the central government's problem are:

$$\phi_{i2} u_i' = \phi_{i2} v_i' \frac{N_{i2}}{\sum_k N_{k2}} + \phi_{j2} v_j' \frac{N_{i2}}{\sum_k N_{k2}} \quad i=1,2 \quad [5]$$

where $u_i' = \partial u_i / \partial E_{i2}$ and $v_i' = \partial v_i / \partial C_{i2}$.

Equation [5] means that the optimal distribution of grants should equate, for the two regions, the weighted marginal utility of increased grants to a region to the weighted marginal cost of increased taxes that must be paid by all regions. These weights depend on the weight that the central government assigns to the regions, ϕ_{i2} , and, in the case of the marginal cost, they also depend on the relative size of the region in terms of population, $N_{i2} / \sum_k N_{k2}$ ⁶. Assuming an interior solution, the first order conditions simplify to:

$$\phi_{i2} u_i' = \phi_{j2} u_j' \quad [6]$$

Equation [6] states that, given the cost of funding grants, the centre's grants should equate the weighted marginal utility of the regions' consumers. This equation can be used to define G_{i2}^* as an implicit function of D_{i1} , i.e., the central government's reaction functions. Moreover, applying the implicit function theorem to equation [6], we obtain the following central government responses, which tell us how the regions borrowing decision in the first period affects the allocation of grants in the second period:

⁵ For purpose of exposition, we do not show the solution of the problem that characterizes the regional governments' budgetary decision given that it analyses the effects of bailout expectations on the fiscal discipline of regional governments, and this lies outside the scope of this paper.

⁶ *Ceteris paribus*, the larger the region that receives the additional grants, the higher the cost in terms of additional central taxes. If grants are financed by a proportional tax on income, the marginal cost will be weighted by ϕ_{i2} and by the relative size of the region in terms of income and population. Thus, the weight of the marginal cost depends on the way in which grants are financed.

$$\frac{\partial G_{i2}^*}{\partial D_{i1}} = (1+r) \frac{\phi_i(u_i''/N_i)}{\phi_i(u_i''/N_i) + \phi_j(u_j''/N_j)} = (1+r) \frac{1}{1+\Gamma_i} \quad i, j=1, 2 \quad [7]$$

where $u_i'' = \partial^2 u_i / \partial E_{i2}^2$ and $\Gamma_i = \frac{\phi_j(u_j''/N_j)}{\phi_i(u_i''/N_i)}$

The central government uses grants to bail out a regional government if $\partial G_{i2}^* / \partial D_{i1} > 0$, i.e., if the central government assigns additional grants to a region due to its issue of debt. A bailout cannot be undertaken if grants are completely non-discretionary, debt is not one of their distribution criteria and none of the distribution criteria correlate with debt⁷. In such a scenario, $\partial G_{i2}^* / \partial D_{i1} = 0$. Thus, theoretically, the existence of bailouts is conditioned to the type of grants⁸. Under this model, whenever the central government can manipulate the distribution of grants, it will bail out regional governments, i.e., the sign of this derivative (equation [7]) is always positive, since the utility function is assumed to be concave in its arguments ($u_i'' < 0$). Moreover, $\partial G_{i2}^* / \partial D_{i1} \leq 1+r$ since $\Gamma_i \geq 0$, i.e., the central government will partially or totally bail out regional governments.

This derivative shows that the decision to bail out a region depends on how additional grants affect the welfare of all the regions' consumers, weighted by the relative size of the regions in terms of population and by the weight that the central government assigns to each region. The higher the weighted relative marginal impact that those additional grants generate to the region to which they are assigned (i.e., lower Γ), the greater the magnitude of the bailout will be. In the extreme case where $\Gamma \rightarrow 0$, the central government will completely bail out the regional government (i.e. $\partial G_{i2}^* / \partial D_{i1} = 1+r$).

⁷ For instance, in an equalization grant where *Income* is one of the distribution criteria (the higher the income of the region, the lower the grant it is assigned) and, if *Income* positively correlates with *Debt* ($\text{cov}(\text{Income}, \text{Debt}) > 0$), a bailout can be implemented reducing the weight of *Income* in the formula that determines the distribution of this grant.

⁸ There is, however, empirical evidence that shows that in some cases politicians can manipulate the distribution of grants that are, in principle, formula based (e.g. Khemani, 2003). Such manipulation generally takes place during the bargaining stage among politicians, when the variables to be considered in the formula and their weight are determined.

The impact that these bailouts have on consumer welfare depends on the characteristics of the public goods provided by regional governments⁹, E_i , and on their level of provision¹⁰. The effect on welfare is weighted, on the one hand, by the weight that the central government assigns to regions in its utility function, ϕ_{it} . The higher the relative weight assigned to a region, the greater the magnitude of its bailout will be. On the other hand, the welfare effect is also weighted by the relative size of the regions in terms of population, N_{it} . This characteristic is also considered in ϕ_{it} and as such can have two opposite effects on the decision as to whether to bail out a region. Due to the central government's budget constraint, the larger the region to be bailed out, the greater the impact this action will have on the welfare of the other region. By contrast, the larger the region, the greater will be the weight assigned to it by the central government. Hence, the net effect of the size of the region on the decision to bail it out or not is ambiguous¹¹.

Testable predictions. Thus, the testable predictions derived from this analytical framework are the following:

Hypothesis 1: The central government uses grants to bail out a regional government if it assigns additional grants to a region due to its issue of debt.

Hypothesis 2: The decision to bail out a region is conditioned by the type of grants. In principle, it is more difficult to use non-discretionary grants to bail out regions.

Hypothesis 3: The decision to bail out a region does not only depend on its issue of debt, but also on the characteristics of the public goods that the regional government provides, on the size of the region in terms of population and on the weight that the central government assigns to each region.

⁹ For instance, as we will argue in section four, the impact of these additional grants is expected to be higher when they are devoted to the financing of basic public goods, such as health.

¹⁰ Since the utility function is assumed to be concave, we expect higher values for low levels of provision of the public good, E .

¹¹ In fact, Wildasin (1997) shows that the probability of a region being bailed out increases with its size (*too big to fail*). However, there is also evidence that the probability of being bailed out decreases with the size of the region (*too small to fail*). An example is the bailout provided to two German Länder (von Hagen *et al.*, 2000).

In relation to *Hypothesis 3*, there are clearly other characteristics of the intergovernmental relationships not considered in this simple analytical framework that can induce the central government to bail out regions. These characteristics are country specific. In section 3.3, we identify the characteristics that can induce Spain's central government to use grants to bail out regions.

3. Empirical implementation

3.1. Econometric specification

From the reaction function of the central government, considering the most basic setting in which the central government is benevolent, and all the regions are identical (in terms of their characteristics and the utility of the representative consumer), we can express the following basic equation in order to estimate whether the central government uses grants to bail out regions:

$$G_{it} = \beta D_{it-1} + \sum_c \alpha_c X_{it}^c + F_i + F_t + u_{it} \quad [8]$$

where G_{it} are the intergovernmental grants that region i receives in period t ; D_{it-1} is the public debt of region i in period $t-1$; X_{it}^c are the C control variables picking up the main structural aspects of region i that affect the long-run desired level of grants and its political characteristics; F_i and F_t are fixed region and time effects, respectively, which pick up structural and temporal characteristics that affect the distribution of grants that are not included in the control variables; and, u_{it} is the error term, with zero mean and constant variance. The estimated value of β (i.e. $\partial G_{it} / \partial D_{it-1}$) determines the existence of bailouts, that is, whether grants are used to bail out regions.

Relaxing the previous assumptions and considering regions to be different and the central government not to be fully benevolent, from its reaction function we can specify the following equation to identify the determinants of bailouts:

$$G_{it} = \left(\beta_1 + \sum_j \beta_j Y_{it}^j \right) D_{it-1} + \sum_c \alpha_c X_{it}^c + F_i + F_t + u_{it} \quad [9]$$

where Y_{it}^j are the J variables that summarize the potential economic and political motives of bailouts. If $\hat{\beta}_k$ is positive and statistically significant from zero, we can claim that the characteristic captured by Y^k induces the central government to use grants to bail out regions. Note that this expression allows a given characteristic of the regional government to have a different effect on the general decision of the central government on how to distribute grants and on its decision to use grants to bail out regions. For instance, let's consider that some regions are responsible for providing a key public service such as health care, a characteristic captured by a dummy variable H_{it} equal to 1 if the region is responsible for providing health care during period t and 0 otherwise. The whole effect of this characteristic on the distribution of grants is captured by the following expression:

$$\frac{\partial G_{it}}{\partial H_{it}} = \hat{\beta}_H D_{it} + \hat{\alpha}_H \quad [10]$$

where $\hat{\alpha}_H$ measures the estimated effect of being responsible for providing health care on the general decision of the central government on how to distribution grants and $\hat{\beta}_H$ is the estimated effect on its decision to use grants to bail out regions.

3.2. Fiscal Federalism in Spain

Fiscal decentralization. Spain's decentralization process started in 1978 with the passing of the Constitution whereby seventeen regional governments, the Autonomous Communities (AC), were created. For historical reasons, two types of regions exist: the foral communities of Navarra and the Basque Country, and the rest (*common regime* AC). Given the great differences in their financing system, we only consider the 15 *common regime* regions in our analysis here. Since their creation, not all these regions have been responsible for providing the same public goods and services. Indeed, one of the main differences between them, until 2002, was that not all of the regions had responsibility for the provision of health care and education, with responsibility for expenditure in these areas being assigned to them at different points in time. In 1983 the revenue from some taxes was first ceded to regional governments, but the sum was insufficient to cover all their expenditure needs, which continued to be financed primarily by grants from the central government. Since 1986, the regional system of finance has been

negotiated and modified every five years¹², with the aim of increasing the fiscal autonomy of the regions. Moreover, in 1992 the Spanish central government passed a law (*Escenarios de Consolidación Presupuestaria*, ECP) limiting central and regional borrowing ability, in order to fulfil the requirements of the Maastricht Treaty¹³.

[Insert Table 1]

Grants. As can be seen in Table 1, during the period analysed (1986-2001), intergovernmental grants have been the main source of revenue for the Spanish regions. They provided, on average, around 70% of total regional resources. Of these, some were completely discretionary (18%), in the main capital grants, while the greatest share of grants was non-discretionary (82%). The *PIE* (*Participación en los Ingresos del Estado*, share of state revenues) was the main grant (44%) and it is, a priori, non-discretionary, since its distribution is formula based. The amount of resources that an AC receives from PIE is determined by applying its formula only for the first year of the financing system. In the other years, each AC receives the monies corresponding to the first year assessment, but the revenue level is up-dated on the basis of a common index. However, there is still some room for discretion in the assignment of this grant, particularly given that the formula can be modified every five years when the regions renegotiate their financing system. In fact, this formula is the result of a political negotiation. In addition to this formula, there are a number of rules and financial guarantees that determine its distribution. These additional rules have no economic justification and cause that the final distribution of this grant is far away from the result obtained when applying the formula only. Thus, taken together these two traits provide a certain degree of discretion.

The second most important grant in quantitative terms is that devoted to financing the regional provision of health care. It is also, a priori, non-discretionary since it is determined on a formula basis, but not one applied yearly. However, here also there is room for discretion during the bargaining of the system. Moreover, until 1994 the implementation of the health financing

¹² During the period analysed there have been three different financing systems operating between 1987-1991, 1992-1996 and 1997-2001, respectively.

¹³ See Lago (2005) and Bosch and Duran (2007) for a broad description of the financing system operated by the Spanish regions.

system was based on bilateral agreements between the regions and the central government, which introduced an additional element of discretion in its distribution¹⁴.

Regional public debt. As the figures in the last row of Table 1 show, the issue of debt by regional governments has increased substantially, especially since 1992, when the ECP established the limits on debt.

Political environment. In central and regional elections, the electoral districts are the provinces. The number of representatives elected in each province depends on its population size, and the d'Hondt formula with a threshold is used to translate votes into representatives. As such, the system is not entirely proportional and, in practice, it is much easier to win a seat in certain provinces (rural areas) than in others. In Spain, central and regional elections are usually held at regular four-year intervals, although they can be called before the end of the term-of-office. During the period analysed (1986-2001), five central and five regional¹⁵ elections have been held. The incumbent at the centre has been left-wing (PSOE) during the first ten years, and right-wing (PP) during the last six years¹⁶. Among the regions, the incumbent has always been left-wing in just three and always right-wing in just two. In other words, during the period analysed there have been significant variations in the political characteristics of both central and regional governments.

3.3. Sample, variables and data source

In this section we enumerate the potential bailout determinants and the variables used here to proxy them, as well as the other variables used in this empirical analysis. A summary of the definitions of these variables and the data sources used can be found in the Appendix. The model's predictions regarding the existence and the determinants of bailout grants are tested using data for the 15 common regime Spanish regions for the period 1986-2001.

¹⁴ During the period analysed there have been two health financing systems, covering the periods 1994-1997 and 1998-2001, respectively. Since 2002, all the regions have had responsibility for providing health care and its financing system has been incorporated within the general system.

¹⁵ Central elections took place in 1986, 1989, 1993, 1996 and 2000. Regional elections are not held simultaneously in all regions. See Solé-Ollé and Sorribas-Navarro (2007) for a broader description of Spain's electoral system and political parties.

¹⁶ PSOE: *Partido Socialista Obrero Español*; PP *Partido Popular*. PSOE is recognised as being a left-wing party and PP as right-wing.

Determinants of bailouts

Types of intergovernmental grants. As highlighted earlier, the existence of bailouts is conditioned by the types of grant in use. If the distribution of grants is discretionary, central government can use them to bail out regional governments. By contrast, if grants are non-discretionary, the central government has little or no discretion in providing additional grants due to regional debt (Rodden, 2001). However, the existence of distribution rules can have the opposite effect and help strengthen the possibility of bailouts. Equalization grants, for example, depending on how they are defined, can result in the central government bailing out regional governments in financial difficulties (Seitz, 2000). Moreover, there is evidence that in some cases politicians can manipulate the distribution of grants that are, in principle, formula based (Khemani, 2003).

To test whether the type of grant conditions its probability of being used to bail out regional governments, the total transfers assigned by central government to the regional governments are broken down into *Non-Discretionary Grants_{it}* and *Discretionary Grants_{it}* depending on whether or not they are formula based.

Assignment of expenditure responsibilities. The decision as to whether to bail out a region is dependent also on the public goods and services provided by that regional government. If a regional government is responsible for providing key public goods or services, such as health care, it is especially difficult for the central government to refuse to bail it out when that region can no longer provide such services. This is particularly true in those cases in which the regional government has little fiscal autonomy, i.e., a low adjustment capacity. It is also true when the central government has established a minimum or standard provision level on those public services that are the responsibility of regional governments (Rodden *et al.*, 2003; Bordignon and Turatti, 2005).

The provision of public goods and services often generates positive externalities to other regions. If a regional government cannot provide the optimal level of these services, the central government will tend to bail it out since any reduction in the provision of these services affects not only the utility of the representative consumer of this region, but also the representative consumers of other regions (Wildasin, 1997). The incentives for the central government to bail out a region increase with the size of these positive externalities, confirming the “*too big to fail*” hypothesis.

To test the effect of these characteristics empirically, the differences in the expenditure responsibilities assigned to regions are proxied by a dummy variable, *Health Care Responsibility_{it}*, which is equal to one if region *i* is responsible for providing health care in year *t* and zero otherwise. Provision of health care is considered a key service by the Spanish central government, which fixes the minimum standard expected. Following Wildasin (1997), the externalities generated by the public goods and services provided by regional governments are proxied by the size of the regions in terms of population, *Population Share_{it}*. As we have seen in the analytical framework, this variable also proxies one of the characteristics that can determine the weight that the central government assigns to each region in its objective function, and its expected sign can be either positive or negative.

Degree of borrowing autonomy. Many countries impose borrowing restrictions on regional governments¹⁷ in order to avoid regional fiscal problems and, hence, the need for bailouts. The success of these restrictions depends on the regional governments' ability to circumvent them (Milesi-Ferretti, 2000) and on their credibility (Mikesell, 2002). If they are not effective, these limits can have the opposite effect. If complying with them is important for the central government, their establishment can result in the central government bailing out regions that exceed them.

To test the effect on the central government's reaction function of the limits on debt established in 1992, we define a temporal dummy *Limits on Debt_t*, which is equal to one during the period 1992-2001, and is equal to zero otherwise.

Political benefits. The decision to use grants to bail out a region can also be determined by political reasons, since, as we have argued in the analytical framework, it seems reasonable to assume that the weights that the central government assigns to the regions in its objective function, ϕ_{it} , depend on their political characteristics. A growing number of empirical studies have recently analysed the influence of political factors on the distribution of grants. This literature identifies political alignment, electoral productivity and partisanship as the main determinants of the distribution of grants. Thus, recent papers claim that the party in central government assigns more grants to politically-aligned regions (i.e., regions that are ruled by the same party as the one in central government), since in this case, all the political credit (i.e., votes) derived from the grants is fully captured by the party (Solé-Ollé and Sorribas-Navarro,

¹⁷ These restrictions can take many forms, such as balanced budget constraints or restrictions on the ability to issue debt. See Ter-Minassian and Craig (1997) for a summary.

2007; Arulampalam *et al.*, 2008). Some papers suggest that parties will allocate more resources in regions where the marginal gains to be obtained are higher, that is, in regions where a high share of voters have been shown to be relatively indifferent to the incumbent and the challenger (i.e., regions with a high proportion of “swing voters”) (e.g. Case, 2001; Dahlberg and Johansson, 2002; Johansson, 2003). Some of these papers have sought to contrast this hypothesis with an alternative theory that claims that, if politicians are risk averse, more grants will be allocated to those jurisdictions in which voters are clearly attached to the incumbent party (i.e. regions with a high proportion of “core supporters”) (Dahlberg and Johansson, 2002; Castells and Solé-Ollé, 2005).

To test whether these political characteristics affect the decision of the central government to use grants to bail out regional governments, we define the following variables. To test the effect of political alignment, we define two variables: on the one hand, a dummy variable, *Aligned_{it}*, that is equal to one when either the single-party or the leader of the coalition in the regional government is the same party as that in the central government (also a single party or coalition leader); and, on the other, we define a dummy variable, *Pivotal_{it}*, that is equal to one when a party that is a partner in the coalition in the central government is the same as the single party or the leader of the coalition at the regional level. This variable captures the regions that are ruled by a party that is also a member of the central government and that is needed to form the central government (see Solé-Ollé and Sorribas-Navarro, 2007 for a discussion of the definition of the alignment status). To test the effect of electoral productivity, we define a dummy variable, *Swing_{it}*, that is equal to one when the party in the central government obtained more than 35% of the votes in region *i* at the general elections held prior to *t* and its electoral margin is lower than 10 perceptual points. Since Spain does not have a two-party system, we measure the electoral margin as the difference (in absolute value) between the vote share of the party in government and the vote share of the next party, with either more or fewer votes (Johnston *et al.*, 1999). To test the effect of partisanship, we define a dummy variable, *Core_{it}*, that is equal to one when the party in the central government obtained more than 40% of the votes with an electoral margin greater than 10 at the previous general elections¹⁸. The swing regions can be aligned or unaligned, but the core regions are always aligned. Thus, the *Aligned* and *Core* variables are highly correlated and the excluded category is the *Non-aligned* regions.

¹⁸ As the definitions of *Swing* and *Core* regions are somewhat arbitrary, as a robustness check in the empirical analysis we have defined these variables employing different limits for the share of votes and the electoral margin.

Regional Public Debt The public debt of regional governments, $Debt_{it}$, is the debt defined in the Protocol on the Excessive Deficit of the European Union¹⁹. As discussed above, the financing system of the Spanish regions is renegotiated every five years. To determine whether the central government's decision to bail out a region is different when the financing system is being negotiated, we decompose the stock of public debt at period t as follows. We define the *Initial Debt* $Debt_{it}$ as the public debt that a region i has when the financing system of year t is negotiated; and, the *Accumulated Debt* $Debt_{it}$ as the increase in the stock of debt since that time. If the estimated coefficients of both variables are positive and statistically significant, we can conclude that the central government's decision to bail out regions depends on the stock of debt observed at every period. By contrast, if only the estimated coefficient of *Initial Debt* $Debt_{it}$ is statistically significant, then the decision of the central government is only determined by the stock of debt existing when the financing system is being negotiated.

In order to consider the effect of the negotiation of the health care financing system, for those regions with responsibility for providing health care, we decompose the *Accumulated Debt* into the accumulated debt until the health care financing system comes under negotiation and the remainder²⁰. If the estimated coefficient of the *Initial Debt* and the *Accumulated Debt when negotiating the health care financing system* are positive and statistically significant, we can conclude that the central government's decision to bail out regions depends on the stock of debt observed when the general financing system is being negotiated and, for those regions that are responsible for providing health care, it also depends on the accumulated debt up until the time when the health financing system is being negotiated.

Control variables. Apart from the issue of debt, several structural aspects of the regions might determine the distribution of grants. These structural aspects are mainly related to the expenditure needs and the fiscal capacity of regions. The expenditure needs are proxied by the *Population* $_{it}$ of the region (Solé, 1999) and by an index, *Expenditure Responsibilities* $_{it}$, which considers the differences in the expenditure responsibility assigned to regions. Specifically, this index quantifies the increase in regional expenditure needs due to the assignment of the provision of health and/or education. During the period analysed, Spanish regions mainly had taxes levied on wealth. There were no significant differences in their tax autonomy. Thus, their fiscal capacity is proxied by their gross domestic product, *Income* $_{it}$ (Esteller *et al.*, 2005). We

¹⁹ This includes the long- and short-run debt of the regional public authorities, but it does not consider that of all public firms and organisms. Optimally, we should also consider the debt of the latter bodies, since many regions have used them to externalise public debt. Nonetheless, this data are not available.

²⁰ See the Appendix for a detailed definition of these variables.

also control for the region's rate of unemployment observed in the previous period, $Unemployment_{it-1}$, in order to be sure that these additional grants are assigned because of its level of debt and not because of a downturn in the economy. In addition to these structural aspects, as the literature suggests, we also consider the political variables ($Aligned_{it}$, $Pivotal_{it}$, $Swing_{it}$, and $Core_{it}$) as control variables in accounting for the tactical distribution of grants.

All the monetary variables are expressed at constant 2001 prices and in per capita terms in order to standardize by region size. Note that all these control variables are included in the regressions without any interaction with debt (these are the variables included in X_{it}^c in equation [8]).

3.4. Econometric issues

We start the empirical analysis focusing on *Discretionary Grants*, since both the analytical framework and case studies conducted to date suggest that such grants are the ones mainly used to bail out regions²¹.

We also analyse *Non-Discretionary Grants*, since, as discussed above, in the Spanish case, their distribution criteria and the bargaining process allow some room for discretion. In this case, a lag of the grants is introduced as an explanatory variable in the equations, since as explained earlier, the greatest grant (*PIE*) is calculated using a formula just once every five years. Thus, within a financing system, the amount of *PIE* that a region receives can be expected to be highly dependent on how much that region received in the previous year²². This being the case, their estimation by OLS would be biased since the number of temporal observations in the panel is small (Nickell, 1981). In order to obtain unbiased estimators, we estimate these equations by the Generalised Method of Moments (GMM). Two assumptions are crucial to guarantee the consistency of GMM estimators: the variables cannot be correlated with the error term and, there must be no serial correlation in the error term. To fulfil the first assumption, we express

²¹ We have estimated both a fixed and a random effects version of the model. However, the hypothesis of no correlation between the fixed effects and the variables included in the regression is rejected, i.e. the Hausman test is overcome, and the utilisation of a random coefficients model is rejected. For this reason, we report the results of the within estimator.

²² We have checked the convenience of introducing a lag of the dependent variable when analyzing *Discretionary Grants*, but it was not significant. This result is quite rational, since *Discretionary Grants* are mainly devoted to the financing of public investment and this presents a volatile behaviour over time.

the variables in first differences and use as instruments lagged values of variables in levels²³ (Arellano and Bond, 1991). The Sargan test of overidentifying restrictions to check for the validity of the set of instruments is included. To check the hypothesis of no serial correlation in u_{it} , two tests of serial correlation are provided. If the error term in the levels equation was uncorrelated, then the first difference of the error term would show negative first-order autocorrelation. Thus, it is expected to find first-order serial correlation in the residuals but no second-order serial correlation²⁴.

4. Results

Tables 2 and 3 record the results for the estimation of the central government's reaction function in the case of discretionary grants and Tables 4 and 5 in the case of non-discretionary grants. Tables 2 and 4 show the results that correspond to the estimation of the basic equation, which determines whether the central government uses grants to bail out regional governments (equation [8]). Tables 3 and 5 report the results of the estimation of the extended equation, which takes into account the economic and political factors that can influence the decision of the central government to bail a region out (equation [9]). Table 6 shows whether the central government reacts differently to the stock of regional public debt when the financing system is being negotiated. At the bottom of the tables, we show the results of a battery of specification statistics. In all cases, all the variables are jointly significant and the time effects are also significant.

Discretionary grants We begin by discussing the basic characteristics of the central government's reaction function in the case of discretionary grants (equation [8]). The results reported in Table 2 show that the central government's distribution of discretionary grants positively depends on the issue of debt by regional governments (i.e. $\partial DG_{it} / \partial D_{it-1} > 0$ and statistically significant). Thus, the initial conclusion to be drawn is that Spain's central government uses discretionary grants to bail out regional governments. If a region increases its debt by 100€ per capita, the central government will, on average, assign to this region an

²³ Among the possible transformations, we have chosen that of the first differences because it guarantees that GMM estimators are consistent even when the instruments are not strictly exogenous (Lahiri, 1993). We use two lagged values of the variables in levels as instruments.

²⁴ Although in the presence of heteroscedasticity it is more efficient to use the two-steps GMM procedure, given the characteristic of our sample (small n and t), its standard errors can be a poor guide for hypothesis testing (Arellano and Bond, 1991). Thus, we use the one-step GMM estimator.

additional discretionary grant of 1.9 € per capita. Hence, the Spanish central government partially bails regional governments out. The serial correlation tests show that there is no autocorrelation.

[Insert Table 2]

If we examine the control variables, the results show that more discretionary grants are assigned to richer regions. Expenditure needs and the rate of unemployment do not play any role in the allocation of discretionary grants. There is, however, evidence of tactical distribution in the assignment of these grants. More discretionary grants are assigned to swing, aligned and pivotal regions. For instance, on average, a swing region will received 7.92 €per capita more, in terms of discretionary grants, than a non-swing region. This difference increases to 11.77 €per capita if it is a swing and aligned region. Among the aligned regions, the central government assigns substantially more discretionary grants to those that are pivotal (3.85 €vs. 11.12 €per capita). There is no evidence that the central government assigns more resources to the core regions. Thus, we observe that the distribution of these resources seeks to maximize their electoral productivity. As a robustness check of these results, due to the high correlation between the *Aligned* and *Core* variables, we have run the regression considering them together and separately. We have also run these regressions with alternative definitions of the *Core* and *Swing* regions (i.e., establishing different limits on the share of votes and the electoral margin) but did not obtain significantly different results.

[Insert Table 3]

Having determined that Spain's central government does use discretionary grants to partially bail out regional governments, we now move on to analyse the economic and political reasons underlying this decision. As the results in Table 3 show, swing regions receive a higher additional discretionary grant than that received by non-swing regions, independently of their alignment status. On average, if a swing region increases its debt by 100 € the central government will assign to this region an additional discretionary grant of 4.2 €(compared to 1.6 €if it is a non-swing region). Thus, being a swing region is a characteristic that not only affects the decision of the central government to use discretionary grants to bail out regions, but also its general decision on how to distribute these grants.

There is no evidence that any of the economic characteristics of the institutional setting identified here as potential factors that might lead the central government to bail out a region actually affect this decision. Thus, a region's having responsibility for the provision of health

care, the size of the region in terms of population, and the existence of limits on the issue of debt do not affect the decision of the central government to use grants to bail out regions.

Non-discretionary grants. In the case of the central government's reaction function when non-discretionary grants are considered, Table 4 shows that their distribution also depends on the regional governments' issue of debt. Specifically, if a region increases its debt by 100 €, the central government will assign to this region an additional non-discretionary grant of 7.7 € in the following period, and one of 13.18 € in the long run²⁵. Thus, although theoretically it has been argued that non-discretionary grants are rarely used to bail out regional governments, there is evidence that Spain's central government does use non-discretionary grants for that specific purpose. As discussed above, the most quantitatively important non-discretionary grants are *PIE* and *Health Care Grants* and their distribution criteria allow certain room for discretion. A further finding is that the distribution of non-discretionary grants in period t positively depends on their distribution in period $t-1$. This result corroborates the convenience of incorporating dynamics in the analysis. As can be seen at the bottom of Table 5, the serial correlation tests show that there is first-order serial correlation ($AR(1)$) in the first-differenced residuals but no second-order correlation ($AR(2)$). The Sargan tests confirm the validity of the instruments used.

[Insert Table 4]

If we examine the control variables, apart from the lag of grants, the differences in the responsibilities assigned to regions regarding expenditure positively determine their distribution. The non significance of the other economic control variables capturing expenditure needs and fiscal capacity can be explained by the fact that their impact on the distribution of grants is already picked up by the lagged value of the endogenous variable. The rate of unemployment does not affect the distribution of non-discretionary grants. Among the political control variables, only the fact of being a swing region positively affects the amount of non-discretionary grants assigned by the central government. As Khemani (2003) claims, formula-based grants are less sensitive to political interests. However, here, this result may also be due to the characteristics of the political variables. They are measured only when an election is held, and they are constant until the next election. Since they are expressed in first differences, they are zero for all the years in which an election is not held. Therefore, the source of variation in

²⁵ β is the reaction of the central government in the short run, while $\beta/(1-\theta)$ is its reaction in the long run, where θ is the coefficient associated to NDG_{it-1} .

these variables may not suffice to identify their effect on the distribution of non-discretionary grants.

[Insert Table 5]

Regarding the economic and political determinants of the central government's decision to use non-discretionary grants to bail out regions, the following conclusions should be highlighted (Table 5). First, differences in the responsibilities assigned to regions regarding expenditure affect the central government's decision to bail out regional governments. Specifically, responsibility for health care provision leads the central government to bail out regional governments. If a region increases its debt by 100 €, the central government will, on average, assign to this region an additional non-discretionary grant of 34.00 € in the following year if this region is responsible for providing health care (as opposed to just 4.9 € if it is not). This result can be explained by the fact that the central government considers health a key service and it regulates its minimum level of service provision. As not all regions are responsible for providing education, we have also tested this effect. The results claim that the assignment of the provision of education to regional governments does not affect the central government's reaction function. A feasible explanation for this might be that the central government considers health a more essential service than education. Another explanation is that expenditure in health care is highly expansive (due to technological changes and the aging of the population) and, thus, it is difficult to control.

Second, the establishment of limits on the borrowing autonomy of regional governments affects the decision whether or not to bail out a regional government. Specifically, the limits introduced in 1992 induce the central government to distribute non-discretionary grants in order to bail out regions. On average, after the establishment of those limits, if a region increases its debt by 100 €, the central government will assign to this region an additional non-discretionary grant of 21.4 € in the following year (as opposed to 4.9 € before their establishment). It is not possible from these results, therefore, to conclude that the limits introduced were effective. In fact, as discussed earlier, regional debt has increased substantially since these limits were introduced. This set of circumstances can be explained by the design of these limits, which did not include any penalty in case of non-compliance. Moreover, for the central government it was important to meet these criteria, in order to fulfil the requirements of the Maastricht Treaty. These two facts served to undermine their overall credibility.

Third, as in the case of discretionary grants, swing regions receive a higher bailout than that received by non-swing regions. On average, if a swing region increases its debt by 100 € the

central government will assign to this region an additional non-discretionary grant of 13.6 €(as opposed to just 4.9 €for a non-swing region). These results are robust to broader and narrower definitions of both swing and core regions.

Thus the decision of the central government to use non-discretionary grants to bail out regions is determined by economic and political reasons. Moreover, the magnitude of the bailout can be significant. For instance, following the establishment of limits on the use of debt, a swing region with responsibility for health care provision that increases its debt by 100 €in a one-year period will receive 59.2 €of additional non-discretionary grants in the following year. Thus, more than half of its increase in debt will be covered by additional resources coming from the central government.

Regional Public Debt. An analysis of the stock of debt that determines the reaction of the central government (Table 6) shows that for both types of grant, discretionary and non-discretionary, only the debt in existence when the general financing system is being negotiated is of any importance. The distribution of grants reacts to the stock of regional public debt observed when the general financing system is being negotiated, but not to the variation in this stock throughout the period in which the system has been applied. In the case of the regions that are responsible for providing health care, the central government also reacts to the debt that exists when the health care financing system is being negotiated. This holds for discretionary and non discretionary grants. As the results in Table 6 show, if a region increases its debt by 100 €in the year that the general financing system is being negotiated, the central government will assign this region an additional discretionary grant of 2.3 €for each year that this system has applied, independently of the evolution in its regional public debt. If this region is responsible for providing health care, and if its stock of debt increases by 100 €in the period between the approval of the general financing and the negotiation of the health care financing system, then the central government will assign this region an additional discretionary grant of 4.7 € (2.3+2.4).

[Insert Table 6]

In the case of non-discretionary grants, these results are due in all probability to the inability of the central government to modify the distribution of such grants significantly, except when the general or health care financing systems are being negotiated. By contrast, in the case of discretionary grants, these results may reflect the fact that the reaction of the central government is not linear to the stock of regional public debt. Additionally, it might also be the case that the central government is more sensitive to the use of public regional debt when the financing

system is under negotiation. In other words, the distribution of discretionary grants can be used to convince some regions to approve the new financing system.

5. Conclusions

This paper has analysed the main determinants of a central government's decision to use grants to bail out its regional governments, i.e., the determinants of additional grants assigned by a central government to its regions owing to an increase in their issue of debt. The grant equation is derived from a simple two-period, inter-temporal model in which the regions are Stackelberg leaders and the central government's objective is to maximize a weighted sum of the welfare of the representative consumers from all the regions. The weights assigned to the regions depend on their size, in terms of population, and on their political characteristics, since the goal of the central government is to maximize not only the general social welfare, but also its own welfare by ensuring its maintenance in power. The grant equation has been estimated using data for the 15 Spanish common regime regions during the period 1986-2001. This equation has been estimated separately for discretionary grants and non-discretionary grants, since both theoretical and case studies indicate that the former are the transfers used primarily to bail out regions.

The results show that Spain's central government does use grants to partially bail out regions. This conclusion holds for both discretionary and non-discretionary grants. Specifically, if a region increases its issue of debt by 100 € in the following period the central government will assign to it, on average, an additional discretionary grant of 1.9 € and an additional non-discretionary grant of 7.7 € (13.18 € in the long run). Thus, although the distribution of the non-discretionary grants is mainly formula based, there is still some room for discretion in their assignment.

In the case of discretionary grants, swing regions receive a higher amount from these grants because of their issue of debt. If a swing region increases its debt by 100 €, the central government will assign to this region, on average, an additional discretionary grant of 4.2 € (compared to just 1.6 € for a non-swing region). This indicates that a proportion of these discretionary bailout grants seeks to maximize their electoral productivity.

There is evidence of both economic and political motives underlying the central government's decision to use non-discretionary grants to bail out regions. First and foremost, central government uses non-discretionary grants to bail out those regions that have responsibility for the provision of health care. The Spanish central government considers health care a key service

and it regulates a minimum level of service provision. Moreover, it is a particularly highly expansive spending category. This finding is consistent with the explicit bail out provided by the central government to the regions, in 2006, to guarantee the funding of the healthcare system. Second, the establishment of limits on the borrowing autonomy of the regions induces the central government to use non-discretionary grants to bail out regions. These limits, introduced in 1992 in compliance with the Maastricht Treaty, have led the central government to bail out regions, because of the importance of meeting these criteria. This finding highlights the importance of the design of such borrowing limits on the issue of debt. Third, as in the case of discretionary grants, swing regions receive higher bailouts than those received by non-swing regions. The size of bailouts can be considerable and differ significantly among the regions. For instance, after the introduction of the debt limits, if a region increases its use of debt by 100 € it will receive an additional non-discretionary grant of 21.4 € an amount that increases to 50.5 € if the region is responsible for providing health care and to 59.2 € if it is also a swing region.

This study has also shown that the distribution of grants by the central government only reacts to the existing stock of regional public debt when the general financing system is under negotiation. In the case of regions that are responsible for providing health care, the central government also reacts to the stock of debt that these regions have when the health care financing system is being negotiated. All other variations in the stock of debt do not affect the central government's decision to bail out regions. These results hold equally for discretionary and non-discretionary grants and reflect, on the one hand, a non-linear reaction of the central government's distribution of grants to the stock of debt; while, on the other, the distribution of non-discretionary grants can only be significantly modified when the financing systems are being negotiated.

These results show that the institutional framework regulating intergovernmental relationships between the Spanish centre and its regions has the effect of inducing the central government to use grants to bail out these communities. As this circumstance can engender expectations among the regions of being bailed out and lead to a lack of fiscal discipline, there is an obvious need for the system of finance to be reformed. There is, for example, clear indications that the health financing system should be reformed, while the distribution criteria applied in the allocation of the main non-discretionary grant, *PIE*, need redefining so as to avoid its being used to bail out regions that increase their issue of debt. A further feasible reform option might involve increasing the fiscal autonomy of the regions, furnishing them with an efficient regional system of taxation that would enable them to adjust their revenue according to their expenditure needs.

Appendix: Definition of the variables, descriptive statistics and data source²⁶

<i>Variable</i>	<i>Definition</i>	<i>Mean</i> (<i>s.d.</i>)	<i>Source</i>
<i>Discretionary Grants_{it}</i>	Discretionary grants per capita (pc) received by region <i>i</i> in period <i>t</i> (2001 € pc)	27.993 (23.877)	BADESPE
<i>Non-Discretionary Grants_{it}</i>	Non-discretionary grants pc received by region <i>i</i> in period <i>t</i> (2001 € pc)	488.571 (430.605)	BADESPE
<i>Debt_{it}</i>	Regional public debt pc of region <i>i</i> in period <i>t</i> (2001 € pc)	462.828 (357.881)	Banc of Spain
<i>Population_{it}</i>	Population of region <i>i</i> in period <i>t</i>	2460272 (2076172)	National Institute of Statistics (INE)
<i>Expenditure Responsibilities_{it}</i>	Increase in regional expenditures needs due to the assignment of the provision of health and/or education.	0.482 (0.601)	
<i>Income_{it}</i>	Gross domestic product of region <i>i</i> in period <i>t</i> (2001 € pc)	8527.250 (1821.418)	INE
<i>Unemployment_{it}</i>	Unemployment rate in region <i>i</i> in period <i>t</i>	0.176 (0.061)	INE
<i>Health_{it}</i>	1 if region <i>i</i> is responsible for providing health in period <i>t</i> 0 otherwise	0.270 (0.445)	
<i>Population Share_{it}</i>	$Population_{it} / \sum_i Population_{it}$	0.067 (0.0562)	INE
<i>Limits on Debt_t</i>	1 if <i>t</i> = 1992-2001 0 if <i>t</i> = 1986-1991	0.625 (0.485)	
<i>Aligned_{it}</i>	1 if a single party or a party leading a coalition at the regional government in <i>i</i> is the same party in the central government (also a single party or a coalition leader) at year <i>t</i> 0 otherwise	0.546 (0.499)	Ministry of Interior (MI) & Eleweb
<i>Pivotal_{it}</i>	1 if a single party or a party leading a coalition at the regional government in <i>i</i> is the same party as the coalition partner at the central government at year <i>t</i> 0 otherwise	0.033 (0.180)	MI & Eleweb
<i>Core_{it}</i>	1 if the party at central government obtained more than 40% of the votes in the general elections hold previous to <i>t</i> and the electoral margin is bigger than 10 percentual points 0 otherwise	0.396 (0.490)	MI
<i>Swing_{it}</i>	1 if the party at the central government obtained more than 35% of the votes in the general elections hold previous to <i>t</i> and its electoral margin is lower than 10 percentual points 0 otherwise	0.296 (0.457)	MI

²⁶ 1. See footnote Table 1. 2. INE: *Instituto Nacional de Estadística*, National Institute of Statistics (www.ine.es). 3. Eleweb: *Xarxa temàtica en "eleccions, comunicació política i opinió pública"*, net on elections, political communication and public opinion (www.eleweb.net).

Grants

Non-discretionary transfers include PIE (called *Fondo de Suficiencia*, since 2002), Health Care Grant, Guarantee Fund (*Fondo de Garantía*), Fund of Inter-territorial Compensation (*Fondo de Compensación Interterritorial*) and expenditure responsibilities assigned to regional governments that are not included in PIE.

Discretionary Transfers include transfer to enterprises and families, investment projects (*convenios y contratos*), other conditional transfers, extraordinary compensations and self-government grants (*órganos de autogobierno*).

Regional Public Debt

$$Debt_{it} = Initial\ Debt_{it} + Accumulated\ Debt_{it}$$

Initial Debt: Public debt that a region i has when the financing system of year t is negotiated

Initial Debt_{it} is $Debt_{i1986}$ for $t=1987-1991$, $Debt_{i1991}$ for $t=1992-1996$ and $Debt_{i1996}$; for $t=1997-2001$

$$Accumulated\ Debt_{it} = Debt_{it} - Initial\ Debt_{it}$$

For the regions that are responsible for providing health care:

$$Debt_{it} = Initial\ Debt_{it} + \\ + Accumulated\ Debt\ when\ negotiating\ the\ health\ care\ financing\ system_{it} + \\ + Accumulated\ Debt\ if\ responsible\ for\ health_{it}$$

Accumulated Debt when negotiating the health care financing system_{it} = *Debt when negotiating the health care financing system_{it}* – *Initial Debt_{it}*.

It is only different from zero for those regions that are responsible for providing health care and during the years, within a period of the general financing system, after the health care financing system has been negotiated. Thus, for the regions that are responsible for providing health care, *Debt when negotiating the health care financing system* is $Debt_{i1993}$ for $t=1994-1996$, and $Debt_{i1997}$ for $t=1998-2001$. It is 0 otherwise.

$$Accumulated\ Debt\ if\ responsible\ for\ health_{it} = t_1 \times (Debt_{it} - Initial\ Debt_{it}) +$$

$t_2 \times (\text{Debt when negotiating health care financing system}_{it} - \text{Initial Debt}_{it})$

where $t_1=1$ the years before the health care financing system is negotiated, and 0 otherwise;
 $t_2=1$ the years after the health care financing system is negotiated, and 0 otherwise

Expenditure responsibilities

This index is computed as follows:

$$IER_{it} = (H_{it}EH + Ed_{it}EEd)/CE$$

where H_{it} and Ed_{it} are dummy variables that are equal to one if the region i has been assigned the provision of health or education, respectively, in period t ; $EH=564,67\text{€}$, $EEd=428,05\text{€}$, $CE=714,48\text{€}$ is the average per capita expenditure, at 2001 constant prices, during the period 1986-2001 on health, education, and on the provision of the public goods and services that are assigned to all regions, respectively. Hence, IER_{it} is equal to 0 if the region has not been assigned health neither education; is equal to 0,8 (0,6) if it is responsible for providing health (education); and, is equal to 1,4 if it is responsible for providing health and education.

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Table 1*Financing system of common regions. Average values, €2001 per capita*

	1987-1991	1992-1996	1997-2001
Other revenues	189.19	230.26	415.17
Grants	715.17	1025.49	1311.92
Total non-financial revenues	904.36	1255.75	1727.09
% Discretionary grants	15.45%	15.42%	26.63%
% Non-discretionary grants	84.55%	84.58%	73.37%
Public debt	2569.76	8185.67	11228.10

Source: BADESPE and *Banco de España*. . BADESPE: *Base de Datos Económicos del Sector Público Español*, data base of the Spanish public sector, elaborated by the Spanish Institute of Fiscal Studies (www.ife.es). *Banco de España*: Spanish central Banc (www.bde.es).

Table 2*Existence of regional government bailouts: Discretionary grants (1986-2001, 15 regions, within estimator)*

	[1]	[2]	[3]	[4]
<i>Existence of bailouts</i>				
<i>Debt (t-1)</i>	0.018 (2.35)**	0.018 (2.42)**	0.019 (2.46)**	0.019 (2.45)**
<i>Economic controls</i>				
<i>Population</i> (10 ⁻⁶)	-4.993 (-0.40)	-4.129 (-0.35)	-4.018 (-0.30)	-1.913 (-0.14)
<i>Expenditure Responsibilities</i>	0.283 (0.03)	0.331 (0.03)	1.849 (0.204)	0.201 (0.02)
<i>Income</i> (10 ⁻³)	5.788 (1.60)	6.031 (1.68)*	6.173 (1.60)	6.077 (1.66)*
<i>Unemployment (t-1)</i>	-49.862 (-0.64)	-34.240 (-0.40)	-60.064 (-0.75)	-27.127 (-0.31)
<i>Political controls</i>				
<i>Swing</i>	5.499 (2.53)**	5.326 (2.45)**	9.326 (3.22)**	7.923 (2.81)**
<i>Core</i>	-5.387 (-1.16)	-4.680 (-0.960)	0.938 (0.469)	--
<i>Aligned + Pivotal</i>	7.341 (1.69)*	--	--	--
<i>Aligned</i>	--	6.697 (1.60)	--	3.850 (1.65)*
<i>Pivotal</i>	--	12.448 (2.03)**	--	11.122 (1.97)**
<i>Year dummies</i>	YES	YES	YES	YES
<i>R²</i>	0.4676	0.4689	0.4592	0.4666
<i>F-est (zero slopes)</i>	15.17 [0.00]	16.40 [0.00]	15.02 [0.00]	14.95 [0.00]
<i>F-est (zero year)</i>	11.49 [0.00]	12.01 [0.00]	12.14 [0.00]	13.09 [0.00]

Notes: 1. Figures in parentheses are t-statistics. 2. *, **, *** denotes significance at 1, 5 and 10% level. 3. Figures within brackets are p-values.

Table 3

Determinants of regional government bailouts: Discretionary grants (1986-2001, 15 regions, within estimator)

	[1]	[2]	[3]	[4]
<i>Determinants of bailouts</i>				
<i>Debt (t-1)</i>	0.015 (2.27)**	0.015 (2.18)**	0.015 (2.21)**	0.016 (2.75)***
× <i>Population Share</i>	-0.088 (-1.40)	-0.026 (-0.51)	-0.069 (-1.11)	--
× <i>Limits on Debt</i>	0.026 (1.12)	0.009 (0.35)	0.012 (0.49)	--
× <i>Health Care Resp.</i>	0.001 (0.19)	0.001 (0.22)	0.002 (0.34)	--
× <i>Swing</i>	0.016 (1.66)*	0.027 (2.10)**	0.021 (2.10)**	0.026 (2.16)**
× <i>Core</i>	-0.024 (-1.52)	--	-0.008 (-0.56)	--
× <i>(Aligned + Pivotal)</i>	0.011 (1.29)	--	--	--
× <i>Aligned</i>	--	0.006 (1.18)	--	--
× <i>Pivotal</i>	--	0.012 (1.21)	--	--
<i>Economic controls</i>				
<i>Population</i> (10 ⁻⁶)	11.221 (0.67)	9.361 (0.57)	10.319 (0.77)	7.920 (0.54)
<i>Expenditure Responsibilities</i>	4.078 (0.47)	4.235 (0.45)	5.105 (0.55)	3.649 (0.38)
<i>Income</i> (10 ⁻³)	9.438 (2.57)**	8.576 (2.40)**	9.209 (2.57)**	8.298 (2.37)**
<i>Unemployment (t-1)</i>	-27.614 (-0.37)	-13.495 (-0.16)	-12.953 (-0.01)	-20.237 (-0.23)
<i>Political controls</i>				
<i>Swing</i>	7.491 (2.51)**	8.421 (2.66)**	7.297 (2.65)**	7.291 (2.73)**
<i>Aligned</i>	3.142 (1.70)*	3.561 (1.73)*	3.421 (1.71)*	3.617 (1.74)*
<i>Pivotal</i>	10.941 (1.99)**	10.025 (1.98)**	10.321 (1.80)*	10.605 (1.82)*
<i>Year dummies</i>	YES	YES	YES	YES
<i>R²</i>	0.4948	0.4990	0.4867	0.4869
<i>F-est (zero slopes)</i>	15.27 [0.00]	14.71 [0.00]	14.09 [0.00]	16.81 [0.00]
<i>F-est (zero year)</i>	12.01 [0.00]	12.54 [0.00]	13.01 [0.00]	12.98 [0.00]

Notes: 1. Figures in parentheses are t-statistics. 2. *, **, *** denotes significance at 1, 5 and 10% level. 3. Figures within brackets are p-values

Table 4

*Existence of regional government bailouts: Non-Discretionary grants
(1986-2001, 15 regions, Arellano and Bond GMM estimator)*

	[1]	[2]	[3]	[4]
<i>Existence of bailouts</i>				
<i>Debt (t-1)</i>	0.079 (2.41)**	0.076 (2.33)**	0.074 (2.29)**	0.077 (2.35)**
<i>Economic controls</i>				
<i>Non-Discretionary Grants (t-1)</i>	0.392 (9.04)***	0.393 (9.01)***	0.398 (9.24)***	0.416 (9.67)***
<i>Population(10⁻³)</i>	-0.298 (-0.82)	-0.297 (-0.81)	-0.295 (-0.47)	-0.284 (-0.59)
<i>Expenditure Responsibilities</i>	462.853 (11.4)***	462.134 (11.7)***	460.461 (11.2)***	456.426 (11.8)***
<i>Income</i>	0.011 (0.68)	0.011 (0.69)	0.012 (0.74)	0.010 (0.64)
<i>Unemployment (t-1)</i>	95.357 (0.33)	75.819 (0.26)	72.045 (0.25)	97.496 (0.33)
<i>Political controls</i>				
<i>Swing</i>	35.63 (1.69)*	35.493 (1.71)*	44.623 (2.10)**	58.171 (2.46)**
<i>Core</i>	-56.728 (-0.96)	-57.362 (-0.97)	-38.355 (-1.57)	--
<i>Aligned + Pivotal</i>	20.343 (1.30)	--	--	--
<i>Aligned</i>	--	20.983 (1.33)	--	14.157 (1.34)
<i>Pivotal</i>	--	12.147 (0.37)	--	11.216 (0.35)
<i>Year dummies</i>	YES	YES	YES	YES
<i>F-est (zero slopes)</i>	21.45 [0.00]	23.87 [0.00]	22.51 [0.00]	23.07 [0.00]
<i>F-est (zero year)</i>	17.30 [0.00]	17.88 [0.00]	18.65 [0.00]	17.55 [0.00]
<i>Sargan test</i>	1.25 [0.53]	1.13 [0.57]	1.20 [0.55]	1.23 [0.54]
<i>AR(1)</i>	-4.91 [0.00]	-4.97 [0.00]	-4.96 [0.00]	-4.96 [0.00]
<i>AR(2)</i>	1.57 [0.11]	1.57 [0.11]	1.46 [0.14]	1.50 [0.13]

Notes: 1. Figures in parentheses are t-statistics. 2. *, **, *** denotes significance at 1, 5 and 10% level. 3. Figures within brackets are p-values.

Table 5

Determinants of regional government bailouts: Non-Discretionary grants (1986-2001, 15 regions, Arellano and Bond GMM estimator)

	[1]	[2]	[3]	[4]
<i>Determinants of bailouts</i>				
<i>Debt(t-1)</i>	0.057 (2.51)**	0.051 (2.49)**	0.051 (2.41)**	0.049 (2.20)**
× <i>Population Share</i>	0.088 (0.21)	0.124 (0.31)	0.301 (0.71)	--
× <i>Limits on Debt</i>	0.123 (1.97)**	0.158 (1.95)**	0.101 (1.80)*	0.165 (2.00)**
× <i>Health Care Resp.</i>	0.264 (3.01)***	0.272 (3.27)***	0.217 (4.06)***	0.291 (6.30)***
× <i>Swing</i>	0.113 (1.90)*	0.096 (1.91)*	0.045 (1.71)*	0.087 (1.67)*
× <i>Core</i>	0.040 (0.73)	--	0.100 (0.62)	--
× <i>(Aligned+Pivotal)</i>	0.024 (0.79)	--	--	--
× <i>Aligned</i>	--	-0.019 (-1.09)	--	--
× <i>Pivotal</i>	--	0.028 (0.65)	--	--
<i>Economic controls</i>				
<i>Non-Discretionary Grants (t-1)</i>	0.232 (4.80)***	0.224 (4.56)***	0.251 (5.19)***	0.204 (4.34)***
<i>Population(10⁻³)</i>	-0.389 (-0.92)	-0.390 (-0.95)	-0.407 (-0.20)	-0.376 (-0.32)
<i>Expenditure Responsibilities</i>	505.221 (11.04)***	507.35 (7.80)***	511.079 (8.08)***	501.731 (7.82)***
<i>Income</i>	-0.010 (-0.64)	-0.011 (-0.66)	-0.006 (-0.39)	-0.012 (-0.79)
<i>Unemployment (t-1)</i>	94.83 (1.12)	95.832 (1.06)	95.10 (0.99)	93.270 (0.41)
<i>Political controls</i>				
<i>Swing</i>	54.236 (2.90)***	47.561 (2.99)***	46.708 (2.93)***	54.894 (2.95)***
<i>Year dummies</i>	YES	YES	YES	YES
<i>F-est (zero slopes)</i>	25.00 [0.00]	25.31 [0.00]	25.74 [0.00]	26.92 [0.00]
<i>F-est (zero year)</i>	18.42 [0.00]	17.98 [0.00]	17.61 [0.00]	17.02 [0.00]
<i>Sargan test</i>	1.22 [0.54]	1.31 [0.52]	1.28 [0.53]	1.27 [0.53]
<i>AR(1)</i>	-6.64 [0.00]	-6.66 [0.00]	-7.02 [0.00]	-6.82 [0.00]
<i>AR(2)</i>	-0.19 [0.85]	0.67 [0.51]	-0.31 [0.75]	-0.61 [0.54]

Notes: 1. Figures in parentheses are t-statistics. 2. *, **, *** denotes significance at 1, 5 and 10% level. 3. Figures within brackets are p-values.

Table 6

*Bailout-grants: importance of the regional public debt
(1986-2001, 15 regions)*

	<i>Discretionary Grants</i>		<i>Non-Discretionary grants</i>	
	[1]	[2]	[3]	[4]
<i>Existence of bailouts</i>				
<i>Initial Debt when negotiating General Financing System (F.S)</i>	0.023 (3.11) ^{***}	0.023 (3.56) ^{***}	0.103 (2.78) ^{***}	0.096 (2.62) ^{***}
<i>Accumulated Debt</i>	0.014 (1.36)	--	0.059 (1.51)	--
<i>Accumulated Debt when negotiating Health F.S.</i>	--	0.024 (1.65) [*]	--	0.068 (1.70) [*]
<i>Accumulated Debt if Responsible of Health</i>	--	-0.015 (-1.33)	--	0.045 (0.75)
<i>Accumulated Debt if not Responsible of Health</i>	--	0.025 (1.25)	--	-0.064 (-0.36)
<i>Economic controls</i>				
<i>Non-Discretionary Grants (t-1)</i>	--	--	0.425 (9.97) ^{***}	0.378 (8.91) ^{***}
<i>Population(10⁻³)</i>	-1.6·10 ⁻³ (-0.12)	-2.6·10 ⁻³ (-0.19)	-0.281 (-0.58)	-0.312 (-0.97)
<i>Expenditure Responsibilities</i>	1.190 (0.12)	4.628 (0.50)	463.224 (10.62) ^{***}	495.296 (10.90) ^{***}
<i>Income (10⁻³)</i>	6.207 (1.66) [*]	5.767 (1.65) [*]	9.710 (0.60)	4.192 (0.26)
<i>Unemployment (t-1)</i>	-24.894 (-0.29)	-26.918 (-0.32)	76.846 (0.62)	97.320 (1.03)
<i>Political controls</i>				
<i>Swing</i>	8.034 (3.07) ^{***}	7.954 (2.91) ^{***}	56.574 (3.39) ^{***}	53.339 (2.71) ^{***}
<i>Aligned</i>	4.047 (1.66) [*]	4.254 (1.67) [*]	--	--
<i>Pivotal</i>	11.141 (1.91) ^{***}	11.037 (1.92) ^{***}	--	--
<i>Year dummies</i>	YES	YES	YES	YES
<i>R2</i>	0.4668	0.4824	0.4592	0.4666
<i>Sargan test</i>	--	--	1.29 [0.52]	1.27 [0.53]
<i>F-est (zero slopes)</i>	14.25 [0.00]	15.97 [0.00]	22.14 [0.00]	24.05 [0.00]
<i>F-est (zero year)</i>	13.89 [0.00]	13.92 [0.00]	19.88 [0.00]	19.96 [0.00]

Notes: 1. Figures in parentheses are t-statistics. 2. *, **, *** denotes significance at 1, 5 and 10% level. 3. Figures within brackets are p-values. 4. Columns [1] & [3] report the results of estimating equation [8] decomposing *Debt* in *Initial Debt when negotiating General Financing System (F.S)* + *Accumulated Debt*. 5 Columns [5] & [4] report the results of estimating equation [8] decomposing *Debt*, for the regions responsible for providing health care, in *Initial Debt when negotiating General Financing System (F.S)* + *Accumulated Debt when negotiating Health F.S.* + *Accumulated Debt if Responsible of Health*; for the regions not responsible for providing health care *Debt* is decomposed in *Initial Debt when negotiating General Financing System (F.S)* + *Accumulated Debt if not Responsible of Health*.

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