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The Uneasy Coexistence of the Spanish Foral and Common Regional Finance Systems

Antoni Zabalza and Julio López-Laborda*

Abstract

This paper develops a model which integrates the *foral* or *cupo* system applied to the Basque Country and Navarre, with the *common* system applied to the other fifteen Spanish autonomous communities. This approach contributes to the understanding of the relationship between foral, non-foral and central jurisdictions, and offers a complete and integrated picture of the whole Spanish system of regional finance. We show that the cupo is nothing more than an indirect form of measuring the equalising transfer between the central government and the corresponding autonomous jurisdiction. If expenditure needs are defined consistently over the whole system, the cupo form *per se* –the indirect manner of measuring the transfer– is completely neutral. The cause of the economic advantage associated with the cupo is the particular imputation procedure used to measure it, which biases the scales in favour of foral communities. The model can readily be estimated with available empirical data. Regarding the Basque Country, we find that out of a 109.1% observed excess of resources per capita, an excess of 61.1% is justified by differences in responsibilities between this jurisdiction and non-foral communities, leaving an unjustified excess of 29.8%. The model has clear implications for reform: we show that, even respecting the indirect form of measuring it, the cupo can be redefined so that foral communities have access to the same amount of resources per capita as non-foral communities.

Keywords: Regional Finance, Spain, Foral System, Common System
JEL classification numbers: H7.

Resumen

El trabajo desarrolla un modelo que integra los sistemas común y foral de financiación autonómica. Este enfoque permite entender las relaciones entre el nivel central y las comunidades de régimen común y foral y ofrece una imagen completa e integrada de la financiación autonómica. El trabajo muestra que el cupo no es más que una forma indirecta de calcular la transferencia de nivelación entre el gobierno central y la correspondiente región. Si las necesidades de gasto se miden de manera consistente para todo el sistema, la forma de cálculo del cupo es completamente neutral. La existencia de una ventaja económica deriva del procedimiento de imputación que se sigue para calcular el cupo. Estimando el modelo con los datos disponibles, encontramos que, de un exceso observado de recursos per cápita del 109,1% para el País Vasco, un 61,1% está justificado por las diferencias competenciales con las comunidades de régimen común, quedando un exceso injustificado del 29,8%. El modelo tiene claras implicaciones de reforma: incluso respetando el procedimiento indirecto para calcularlo, se pude redefinir el cupo de manera que las comunidades forales dispongan de los mismos recursos per cápita que las comunidades de régimen común.

Palabras clave: Financiación regional, España, sistema común, sistema foral.
Clasificación JEL: H7

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1. INTRODUCTION

Regional finance in Spain is not implemented by means of a unique system, but through two different systems that independently coexist with each other. One, known as the *foral* or *cupo* system, is applied to two autonomous communities —the Basque Country and Navarre— and the other, known as the *common* system is applied to the other fifteen autonomous communities[1]. This coexistence is not without problems. For equal responsibilities, the amount of per capita finance provided by the foral system is believed to be much larger than that of the common system. With respect to non foral communities, previous estimates range from 32% to 47% in favour of foral communities.[2] Considering that both the Basque Country and Navarre are among the richest Spanish regions, this generates a widespread sense of injustice among common communities. Also, given that the common system treats poor communities relatively better than rich communities, the latter are doubly aggravated by the income redistribution they have to endure. Of them, Catalonia is perhaps the most vociferous against this discrimination and overtly claims to be placed under the foral system. As Zubiri (2007) points out, the coexistence of these two systems is potentially the most serious threat to the stability of the overall process of political and economic decentralization in Spain.

The origins of the foral system go back to medieval financial arrangements established between the Kingdom of Castile and new annexed territories. Essentially, annexed territories would have the responsibility of collecting taxes and, in exchange for military protection and other, possibly less important services, would pay an exaction to Castile. By the XVIII century, the only territories where these arrangements were still prevalent were the provinces of Alava, Guipuzcoa and Vizcaya (today, the Autonomous Community of the Basque Country) and the old Kingdom of Navarre (today, the Autonomous Community of Navarre). In 1937, during the Spanish Civil War, these foral privileges were abolished in Guipuzcoa and Vizcaya, and were retained in Alava and Navarre. After the Franco regime, a new foral system, purportedly based on those early precedents, was instituted in the two foral autonomous communities through what is today known as the Economic Concert (*Concierto Económico*) for the Basque Country and the Economic Agreement (*Convenio*) for Navarre[3].

The legal foundations of the Economic Concert are, first, the Spanish Constitution (*Boletin Oficial del Estado*, BOE, 1978), which in its First Additional Provision "protects and respects" these traditional arrangements for the Basque Country and Navarre; second, the Statute of Autonomy of the Basque Country (*Estatuto de Autonomía del País Vasco*) (BOE 1979), the basic institutional rule of this region that determines its tax and expenditure

[1] Strictly, there are three other jurisdictions with special regimes: the Canary Islands and the autonomous cities of Ceuta y Melilla, which are a hybrid between municipalities and autonomous communities.

[2] See Zubiri (2007), Buesa (2007 and 2009), Monasterio (2010) and De la Fuente (2011). In Section 5.3 below we analyse these estimates in more detail and compare them with our own results.

[3] See Zubiri and Vallejo (1995), and references to Bilbao (1991) and Fernández de Pinedo (1991) cited there, for a description of the historical precedents of the foral system.

responsibilities and sets the principles for, among other matters, the political and economic relations with the central administration of the Spanish State; third, the law that regulates the Economic Concert (BOE 2007a); and fourth, the law (BOE 2007b) that determines the way to calculate the exaction (the *cupo*) that the Basque Country has to pay the central administration "to contribute to the finance of the general expenses of the State".[4]

Regarding the Navarre Agreement, in addition to the Constitution, the legal foundations are the Organic Law of Reintegration and Improvement of the Foral Regime of Navarre (BOE 1982), which is the equivalent of the Statute of Autonomy of Navarre, and the law that establishes the Economic Agreement between the State and the Foral Community of Navarre (BOE 2007c) and determines the way to calculate the exaction that Navarre has to pay the central administration (the *aportación*). In what follows, and whenever there is no need to be specific, we will call all this set of legal texts, "the law", and use the term *cupo* to refer to both the Basque Country *cupo* and the Navarre *aportación*.

Both the Constitution and the Statute of Autonomy of the Basque Country are very vague as to the concrete design of the Economic Concert. The Statute of Autonomy, however, in its article 41.2.f states that the Economic Concert *"will be applied in accordance with the principle of solidarity referred to in articles 138 and 156 of the Constitution"*. Article 138.1 states that "*the State guarantees the effective realization of the principle of solidarity […], insuring the establishment of a proper and just economic balance among the various parts of Spanish territory […]*"; and article 138.2 states that *"The differences between the Statutes of the Autonomous Communities will, in no case, imply economic or social privileges"*. Article 156 subjects the principle of financial autonomy of the regions to the principles of coordination and solidarity.

The basic elements of the foral system are defined in the law that regulates the Economic Concert, which defines precisely the tax responsibilities of the Basque autonomous community and refers to a further law the concrete procedure to calculate the cupo. In particular, the Basque autonomous community, subject to some harmonizing restrictions, has responsibility for the design, administration, collection, and inspection of all taxes accrued in its territory except for customs tariffs.[5] The final piece of legislation is the law that establishes the calculation procedure and the actual amount of the cupo. In line with traditional fiscal arrangements, the cupo is meant to measure the cost of services that the State has provided to the Basque autonomous community. To that end, the procedure adopted is to apply a fraction representative of the relative size of the Basque Country to the Spanish budget entitlements associated to those responsibilities that have not been transferred to the community. The Navarre legislation is less precise as to the solidarity requirements, but the basic law of the system, BOE (1982), in its articles 1 and 45, establishes as well that Navarre will maintain a relationship of solidarity with respect to all other communities of the Spanish nation. In any

[4] See article 41.2.d) of the Statute of Autonomy of the Basque Country (BOE 1979).

[5] Social Security contributions are excluded from the system.

case, the Navarre legislation is subject to the Spanish Constitution and to its articles 138 and 156. Essentially, the elements of the foral system and the procedure to calculate the cupo are the same in both Navarre and the Basque Country. We discuss this procedure in more detail below.

Whereas the foral system is the result of a bilateral agreement between each of the two foral communities and the central administration, the common regime is the result of a multilateral agreement between the fifteen common autonomous communities and the central administration. The legal base of the common system of regional finance is the LOFCA (BOE 2009a), the basic law that establishes the principles of the system, and the concrete provisions of the present regional finance model are set in BOE (2009b). The system of regional finance for the fifteen common regime autonomous communities consists of ceded national taxes, and a variety of equalization transfers, and its aim is the equalization of resources per unit of need, so that the same service level can be provided by all regions irrespective of their fiscal capacity.[6] Differently from the foral system, ceded taxes do not cover the whole range of taxes accrued in the territory of the respective community. From 1997, several degrees of discretion were granted to regional governments vis-à-vis some of the ceded taxes, allowing autonomous communities to set tax rates and establish tax credits and allowances. Thus, progressively, ceded taxes have in fact become own taxes for regional governments.[7]

Past attempts to account for the larger amount of resources that the foral system generates have been based on the identification of measurement errors of the concepts involved and/or a faulty design of the cupo formula. Castells et al. (2005), Buesa (2009 and 2010) and Monasterio (2010) identify both types of deficiencies in their respective works, De la Fuente (2011) concentrates on the first one and López-Laborda (2007) on the second. The main measurement error referred to in these contributions is the undervaluation of the Spanish budget entitlements associated to responsibilities that have not been transferred to the foral communities, which leads directly to an undervaluation of the cupo. So severe is that undervaluation believed to be, that some of these authors, in their estimation of foral privilege, have felt it necessary to disregard official sources and use hypothetical data based on their own calculation of the cost of services provided by the State to foral communities.

In this paper we show that even restricting ourselves to official data, and thus avoiding the use of hypothetical data, it is possible to identify a substantial positive difference in the amount of resources that the foral system generates vis-à-vis the common system of regional finance. This measure of foral privilege is based exclusively on the particular way in which the cupo is designed. In order to do this, we formally show how the foral system works in relation to the non foral system and to the central jurisdiction budget, thus modelling the

[6] Until 2009 the objective was the full equalization of regional services. Since then, with the last reform, the aims of the system are more confused. In this work we assume, as an approximation, that the common system is one of full equalization. See Zabalza and López-Laborda (2011).

[7] See Zabalza and López-Laborda (2011) and López-Laborda and Monasterio (2007) for a more detailed description of the common system of regional finance.

whole Spanish regional finance system, and identify what its *reference position* would be. We define this reference position as the one in which, consistently with legal requirements, foral jurisdictions have no economic advantage over non foral jurisdictions. In the reference position, the differences observed are justified by the different set of expenditure responsibilities that foral and non foral communities have. Having done that, we then specify the *actual position* of the system according to the legal definition of the cupo, and identify the differences in design and the implied economic consequences between the reference and the actual position. The identified differences in design form the basis of the normative proposal that this paper advances, and the difference in economic resources is our measure of the unjustified advantage of the foral over the non foral system.

The rest of the paper is organized as follows: In Section 2 we describe formally the two Spanish systems of regional finance. In Section 3 we show in detail how expenditure and tax responsibilities are distributed between foral, non-foral and central jurisdictions, in order to make the model susceptible of empirical estimation. Section 4, using the distribution of responsibilities specified in the previous section, defines the correct cupo and the specification that comes out from the particular imputation procedure established in the law. In Section 5 we estimate empirically the model, evaluate the extent of the privilege granted to the foral system and the sources of that privilege, and compare our results with others obtained in the literature. In Section 6 we consider the horizontal equity properties of the correct and legal cupos, and in Section 7 we explore some normative alternatives that could eliminate or at least mitigate the tension produced by the coexistence of two models with such disparate results. Section 8 concludes the paper.

2. THE FORAL AND COMMON SYSTEMS OF REGIONAL FINANCE

The purpose of this section is to formally describe the main characteristics of the two Spanish systems and how they fit in the overall framework of regional finance. We start with a very simple model, which will hopefully help to identify the nature of the foral system and how it stands with respect to the common system, and then progressively add more realistic features to it in order to capture the relevant issues that matter as far as the coexistence of the two systems is concerned.

2.1. Two overlapping jurisdictions[8]

Consider the budget of a unitary economy,

$$E = T + D, \tag{1}$$

where E is expenditure, T is tax revenue and D is the public deficit. In order to reduce the argument to its essential elements, suppose this economy decides to decentralize expenditure

[8] This section is largely based on Zabalza (2011).

and revenue, and for that purpose establishes two overlapping jurisdictions over the whole of the national territory: the national jurisdiction which we index with the exponent *c* (for central), and the autonomous jurisdiction which we index with the exponent *a*. Together with decentralization, it is decided to keep the recourse to debt finance and this faculty is assigned exclusively to the central jurisdiction. After decentralization, the consolidated budget of the two jurisdictions is:

$$E^a + E^c = T^a + T^c + D. \tag{2}$$

Expenditure, E^a and E^c, and revenue, T^a and T^c, are the exogenous variables of this model (established normatively as part of the decentralization decision) and D is, as in the unitary economy, the endogenous variable that results from the normatively chosen levels of expenditure and revenue for the two jurisdictions. That is,

$$D = E - T, \tag{3}$$

where

$$E = E^a + E^c, \tag{4}$$

and

$$T = T^a + T^c. \tag{5}$$

Suppose also that the distribution of responsibilities is not uniform across jurisdictions. The autonomous jurisdiction is assigned a tax capacity, the revenue of which (assessed at a given standard tax policy) is larger than the also normatively assigned expenditure level, and therefore for the central jurisdiction expenditure exceeds resources obtained via tax and debt. That is,

$$E^a < T^a \quad \Rightarrow \quad E^c > T^c + D. \tag{6}$$

Given this distribution of responsibilities, a transfer between jurisdictions is needed so that both of them can finance their normatively assigned expenditure responsibilities. Call this transfer *C* (for *cupo*). To get the definition of this transfer is useful to rewrite the consolidated budget (2) as

$$T^a - E^a = E^c - T^c - D.$$

Written like this, and account taken of (6), the consolidated budget restriction is telling us that the vertical fiscal gap of the two jurisdictions must be the same in absolute terms; a simple implication of the accounting principle of double entry that the consolidated budget incorporates. The transfer *C*, therefore, can be defined using any of these two versions of the vertical fiscal gap:

$$T^a - E^a = C = E^c - T^c - D. \tag{7}$$

To measure this transfer, the common system would have opted for the left hand side of expression (7). That is,

$$C = T^a - E^a. \tag{8}$$

The foral system, on the other hand, opts for the right hand side of expression (7). In the context of this overlapping jurisdictions model, the cupo that the autonomous jurisdiction has to pay to the central jurisdiction equals the expenditure of the central jurisdiction minus the sum of resources that this jurisdiction obtains from tax revenue and new debt. That is,

$$C = E^c - T^c - D \tag{9}$$

Any of the two options obviously yields the same result, but the one chosen by the foral system is a rather cumbersome and indirect way of approaching the problem: it defines the transfer (the cupo), which is an endogenous variable, in terms of the deficit, which is also an endogenous variable, while it could have been directly defined in terms of only exogenous variables of the autonomous jurisdiction as the difference between assessed tax revenue minus the normatively assigned level of expenditure, as shown in expression (8).

This can better be seen, by noticing that the model we are in fact using is formed by the respective budgets of the two jurisdictions,

$$E^c = T^c + C + D, \tag{10}$$

$$E^a = T^a - C. \tag{11}$$

This is a sequential system of two equations in two unknowns, C and D. In terms of exogenous variables, the cupo is obtained from equation (11), $C = T^a - E^a$ and, given the cupo, the deficit is obtained from equation (10) as $D = E - T$.

The explanation of the peculiar definition of the transfer given by (9) has been justified by the historical precedents of the foral system examined above. Traditionally, the cupo was identified with the payment the foral communities had to make to the central government in exchange for services[9]. Suppose for concretion that, given (6) and for a given distribution of tax capacity, in our model the autonomous jurisdiction had responsibilities for all public services except those associated with defence, diplomacy and monetary policy. Then, the cupo would be the payment that the autonomous jurisdiction would make the central jurisdiction for the provision of these pure public goods, the net cost of which, in normative terms, is indeed that shown in expression (9)[10].

2.2. Three non-overlapping jurisdictions

Suppose now that the model is the same as the one just considered, except that instead of having only one autonomous jurisdiction we have two non-overlapping autonomous jurisdictions, the sum of which covers the whole of the national territory: the first is the foral

[9] See article 41.2.d of the *Estatuto de Autonomía del País Vasco* (BOE 1979), which establishes that the Basc Country will contribute to the finance of the State responsibilities not transferred to the community (*cargas generales)* by means of a cupo.

[10] As shall be seen below, interest payments on debt and debt amortization charges are included in E^c .

autonomous community, indexed by *f*, and the second is the non- foral autonomous community, indexed by *nf*[11]. Suppose also that the central jurisdiction obtains revenue not only from taxation, T^c, but also from sources other than taxes, which we denominate RR^c. That is, denoting total central revenue by R^c, we have:

$$R^c = T^c + RR^c. \tag{12}$$

Therefore, the consolidated budget is now:

$$E^f + E^{nf} + E^c = T^f + T^{nf} + R^c + D, \tag{13}$$

where E^f and E^{nf} are the levels of expenditure of respectively the foral and non-foral jurisdictions; T^f and T^{nf} the corresponding tax revenue levels; and the rest of the terms have already been defined.

The distribution of tax responsibilities is again not uniform across jurisdictions: in the foral jurisdiction tax revenue exceeds expenditure, while in the non-foral jurisdiction it falls short. Therefore, tax revenue in the central jurisdiction is now larger than it was in the previous model, and we assume that in this jurisdiction tax revenue, plus non-tax revenue, plus resources obtained through debt exceed expenditure. That is,

$$E^f < T^f, \quad E^{nf} > T^{nf} \quad \text{and} \quad E^c < R^c + D.$$

Suppose the central jurisdiction is the administrator of the whole system of regional finance. To enable the three jurisdictions to finance their normatively assigned expenditure responsibilities, there will have to be a transfer (*cupo*) from the foral to the central jurisdiction, C, and another transfer from the central to the non-foral jurisdiction, which we denote by *S*.

In terms of the budgets of the three jurisdictions,

$$E^f + C = T^f, \tag{14.1}$$

$$E^{nf} = T^{nf} + S, \tag{14.2}$$

$$E^c + S = R^c + C + D. \tag{14.3}$$

Expression (14.3) is the central jurisdiction budget, and expressions (14.1) and (14.2) are the part of the two autonomous jurisdictions budgets that corresponds, in normative terms, to their respective regional finance system. The complete budgets of these two jurisdictions will typically include: other non-tax sources of revenue; tax revenue that may exceed or fall short of the normative levels depending on the stance of the tax policy followed; expenditure that may also deviate from the normatively assigned levels; and possibly a public deficit. In what follows, however, in order to concentrate exclusively on the normative properties of the

[11] Although the empirical estimation below considers the existence of the two foral communities — Basque Country and Navarre — nothing of substance would be gained in the theoretical analysis from the addition of a second foral community.

regional finance system, we consider, for the two autonomous jurisdictions, only the normative values of expenditure and tax revenue associated to their regional finance system, and for the central jurisdiction its full budget. [12,13]

Equations (14) form a sequential system of three equations in three unknowns, *C*, *S* and D. The first equation gives the solution for *C*; the second gives the solution for *S*; and, given *C* and *S*, the third solves for D.

$$C = T^f - E^f, \tag{15.1}$$

$$S = E^{nf} - T^{nf}, \tag{15.2}$$

$$D = E - R, \tag{15.3}$$

where $E = E^f + E^{nf} + E^c$ and $R = T^f + T^{nf} + R^c$.

To obtain the indirect form of the cupo ─the equivalent to equation (9)─, we re-write the consolidated budget (13) as follows:

$$\left(T^f - E^f\right) - \left(E^{nf} - T^{nf}\right) = \left(E^{cf} - R^{cf} - D^f\right) + \left(E^{cnf} - R^{cnf} - D^{nf}\right), \tag{16}$$

where,

$$D^f = E^{tf} - R^{tf} = \left(E^f + E^{cf}\right) - \left(T^f + R^{cf}\right), \tag{17}$$

and

$$D^{nf} = E^{tnf} - R^{tnf} = \left(E^{nf} + E^{cnf}\right) - \left(T^{nf} + R^{cnf}\right). \tag{18}$$

E^{tf} is *total* expenditure in the foral territory by both foral and central jurisdictions and R^{tf} *total* (tax and non-tax) revenue obtained by both jurisdictions in the foral territory; E^{tnf} and R^{tnf} are the corresponding concepts for the non-foral territory. E^{cf} is central government expenditure in the foral territory (and E^{cnf} that in the non-foral territory); R^{cf} is central revenue obtained from or imputed to the foral territory (and R^{cnf} that obtained from or imputed to the non-foral territory). By construction, $E^{cf} + E^{cnf} = E^c$ and $R^{cf} + R^{cnf} = R^c$, and therefore $D^f + D^{nf} = D$.

With reference to expression (16), the definition of the transfer *S* is the second parenthesis on the left hand side of the equality sign, and the indirect definition of the cupo is the first parenthesis on the right hand side. That is,

$$\left(T^f - E^f\right) - S = C + \left(E^{cnf} - R^{cnf} - D^{nf}\right), \tag{19}$$

[12] This asymmetry between the autonomous and the central jurisdictions regarding the definition of their respective budget is needed because, while the regional finance system of the non-foral jurisdiction is defined only in terms of expenditure responsibilities and ceded fiscal capacity, the cupo is legally defined making use (through the deficit) of the full budget of the central administration.

[13] The law defines the central jurisdiction budget in its most extensive form. In particular E^c includes not only interest charges and the purchase of financial assets, but also amortization charges (reduction of financial liabilities).

where

$$C = E^{cf} - R^{cf} - D^{f}. \tag{20}$$

Under the assumptions made so far, equation (15.2) for the non-foral jurisdiction and equation (20) for the foral jurisdiction are the two transfers of the system, and (19) is the formal representation of the way in which the two regimes of regional finance coexist within the consolidated budget of the public sector. The complexity of the indirect definition (20) of the cupo does not detract from the fact that it is exactly equal to definition (15.1) as can be seen by substituting (17) into (20):

$$C = E^{cf} - R^{cf} - D^{f} = E^{cf} - T^{cf} - \left[\left(E^{f} + E^{cf}\right) - \left(T^{f} - R^{cf}\right)\right] = T^{f} - E^{f}.$$

The two transfers S and C —equations (15.2) and (20) respectively— generate the resources that, given their normatively assigned tax capacity, T^{f} and T^{nf}, the non-foral and foral autonomous jurisdictions need to finance their expenditure responsibilities as normatively defined by E^{f} and E^{nf}. To identify the *reference position* of the system, we define these normative levels of expenditure on equal terms: we assume that there is no privilege for any of them and therefore the whole system is compliant with the legal requirement of absence of economic advantage for any jurisdiction. Denote the national equivalent of expenditure at the level of responsibilities of the foral community as NE^{f} and the corresponding concept for the non-foral community as NE^{nf}, where these two levels are not necessarily equal,[14] and, to be more concrete, assume that the normative expenditure assigned to each jurisdiction is distributed between the foral and non-foral communities according to relative population. Thus,

$$E^{f} = \alpha NE^{f} \text{ and } E^{nf} = \left(1-\alpha\right) NE^{nf}, \tag{21}$$

where α is the population share of the foral jurisdiction. Although a simplification, this is approximately the criteria used to define normative expenditure in the fifteen common autonomous communities. Thus, we are assuming that in order to comply with the legal requirement of no-privilege, the system applies the same criteria in order to determine E^{f} and E^{nf}.We therefore conclude that, despite the indirect way of measuring the cupo, the model so far defined, which is the formal expression of the *reference position*, complies with the no-privilege legal requirement —article 138.2 of the Spanish Constitution (BOE 1978).

The *actual position* —the one that actually determines the amount of resources received by the foral jurisdiction— does not involve any essential departure from the model so far. In fact, the only thing that it does (BOE 2007b) is to add to the above model a particular procedure to estimate the three elements of (20) by means of what is known as the *imputation procedure*. However, as we shall see below, this apparently neutral step is critical in breaking down in favour of the foral jurisdiction the no-privilege property of the system so far defined.

[14] As we shall see below, in the Spanish system of regional finance, $NE^{f} > NE^{nf}$.

2.3. Imputation procedure

The *Cupo Law* (BOE 2007b), instead of using (20) as the definition of the cupo, prescribes that the three terms in this expression be raised to the equivalent of their national magnitudes, and the cupo be calculated as the resulting number times a given fixed coefficient (called the imputation coefficient) which is meant to approximate the relative income of the foral jurisdiction.

Therefore, calling the legally prescribed cupo C^L, the formula is,

$$C^L = i\left(NE^{cfL} - NR^{cfL} - ND^{fL}\right), \tag{22}$$

where i is the fixed imputation coefficient and NE^{cfL}, NR^{cfL} and ND^{fL} the legally prescribed way of calculating the national equivalents of, respectively, E^{cf}, R^{cf} and D^f.

The law establishes that NE^{cfL} be calculated from the total budget expenditure of the central jurisdiction, by subtracting from this total the value of those central expenditures that fall within the category of responsibilities of the foral jurisdiction.[15] Regarding NR^{cfL} and ND^{fL}, the law adopts a more direct way: it simply provides the corresponding numerical values, the former being the amount of revenue obtained from those central jurisdiction taxes that have not been transferred to the foral jurisdiction or from other non-tax sources, and the latter the total deficit *D*.

The purpose of this procedure is not stated by the legislator. At this stage, our preliminary conclusion must be that if equation (22) is a good estimator of equation (20), then the imputation procedure should make no difference since equation (20) gives exactly the same result as the correct definition of the cupo (15.1).

Before checking the goodness of (22) as an estimator of (20), however, it is advisable to introduce more structure into the model and, in particular, be more specific about the distribution of both expenditure and tax responsibilities between the three jurisdictions considered. This shall prove helpful not only to clarify conceptual issues, but also to estimate empirically the *reference* and *actual positions* of the model in Section 4.

3. DISTRIBUTION OF EXPENDITURE AND TAX RESPONSIBILITIES

Responsibilities for each jurisdiction, both in expenditure and tax revenue, have been identified so far only by means of their institutional dimension. This is too general for the purpose of this exercise, as it does not allow us to evaluate properly the adequacy or otherwise of the imputation procedure. To this end, and also to estimate empirically the

[15] In the law (BOE 2007b), NE^{cfL} is called "total not assumed (by the corresponding foral community) (expenditure) charges". Also, article 4.3.b rules that, whatever the result of the above subtraction procedure, the transfer *S* should be no part of the measure of "not assumed charges".

model, we need to be more precise as to the nature of responsibilities and how they are linked between jurisdictions.

Expenditure responsibilities

We keep assumption (21) that, for a given set of responsibilities, expenditure capacity should be normatively assigned to each jurisdiction according to relative population. Then we distinguish three types of responsibilities, which measured at their respective national level are: *EA*, those expenditure responsibilities that because of their nature cannot be decentralized; *EB*, those responsibilities that can be decentralized and are assigned to both foral and non foral autonomous jurisdictions; and *EC*, those responsibilities that can be decentralized and are only assigned to the foral jurisdiction.

This yields a convenient way of defining expenditure responsibilities. In particular,

$$E^f = \alpha\left(EB + EC\right), \tag{23.1}$$

$$E^{nf} = \left(1-\alpha\right)EB, \tag{23.2}$$

$$E^c = EA + \left(1-\alpha\right)EC. \tag{23.3}$$

It is easy to see that total assigned expenditure, *E*, is the sum of the three types of expenditure capacity. Namely,

$$E = E^f + E^{nf} + E^c = EA + EB + EC. \tag{24}$$

Also, the national equivalent of expenditure responsibilities assumed by the foral jurisdiction (which the law calls "assumed charges") is $NE^f = EB + EC$ and the national equivalent of "not assumed charges", $NE^{cf} = EA$.

Whereas E^f and E^{nf} are, as a matter of fact, defined restrictively within the set of expenditure responsibilities that have been decentralized (the principal ones being education, health and social services) and that are considered in the normative allocation of expenditure capacity carried out by the regional finance system, E^c is a much wider concept that refers to the whole expenditure budget of the central government, including the purchase of financial assets (Chapter 8) and the amortization of financial liabilities (Chapter 9). The expenditure budget also includes the transfer *S* to the non foral jurisdiction, but we consider this item separately from E^c. Thus, the formal representation of the expenditure side of the central government budget in our model is $E^c + S$.

Tax responsibilities and other revenues

Regarding taxes, suppose the whole system, measured at the national level and in terms of normatively assigned tax revenue, is composed of four groups of tax figures: *ST* (*shared taxes*), taxes the revenue of which is shared between jurisdictions (these are the VAT

and excises); *CT* (*corporation tax*); *OT* (*own taxes*), taxes fully ceded to the autonomous jurisdictions (these include, among others, the net wealth tax, the inheritance and gift tax and the capital transfer tax). The income tax is a shared tax, to the extent that its base is shared between jurisdictions, but at the same time could be seen as an own tax, since autonomous jurisdictions have significant normative powers to determine the structure of tax rates (and also the base, in the case of foral regions). In what follows, and for reasons of expediency which have no effect on the results obtained, we will consider the income tax within the group of shared taxes. The fourth group of taxes is NTT^c (*not transferred taxes*), which are central taxes (mainly custom tariffs and fees, and civil servants pension contributions) not transferred to any of the two autonomous jurisdictions.

In addition to the four tax groups, we consider as well the concept already defined RR^c (*residual revenue*), which as stated above corresponds to revenue obtained by the central jurisdiction from non-tax sources or from transfers other than *C*. Consistently with the expenditure side, the revenue side of the central budget also takes its most extensive form, including the sale of financial assets (Chapter 8). Formally, the revenue side of the central budget in our model is represented as $R^c + C$.

If we further assume that tax revenue is distributed territorially according to income, the correspondence between these tax concepts and those of the model is the following:

$$T^f = \beta\left(ST + CT + OT\right), \tag{25.1}$$

$$T^{nf} = \left(1-\beta\right)\left(\gamma ST + OT\right), \tag{25.2}$$

$$R^c = \left(1-\beta\right)\left[\left(1-\gamma\right)ST + CT\right] + NTT^c + RR^c, \tag{25.3}$$

where β is the foral autonomous jurisdiction income share, and γ is the average proportion of *ST* that is shared by the non foral autonomous jurisdiction.

The above structure gives an idea of the enormous extent of tax decentralization that the foral community enjoys. It is the only jurisdiction that has full control over the collection, management and regulation of own taxes, shared taxes and the corporation tax.[16] In comparison, the non-foral community only has full control over own taxes and has no responsibility over the corporation tax, and the central jurisdiction has responsibility over the corporation tax and shared taxes, but only within the territory of the non-foral community. The only tax revenue that escapes the control of the foral jurisdiction is that from not transferred taxes, NTT^c, which are a relatively small part of the total tax base.[17] The practically total decentralization of taxes raises many questions about the sense that the foral system has in a modern federal economy, and certainly it is difficult to see how a system such

[16] In general, no regulation responsibilities exist in the case of VAT and excise duties.

[17] In the law, the sum $NTT^c + RR^c$, which as seen above is the national equivalent of R^{cf}, NR^{cf}, is called "total not concerted taxes and other revenue". So, $NR^{cf} = NTT^c + RR^c$. Also, the national equivalent of foral tax revenue, $NT^f = ST + OT + CT$, is called "total concerted taxes".

as this could be generalized to the non-foral autonomous communities. In this paper we ignore all these issues and concentrate exclusively on the design of the cupo.

As in the case of expenditures, it is easy to see that the sum of the three jurisdictional tax responsibilities is equal to the sum of the four national group bases considered. That is,

$$T = T^f + T^{nf} + T^c = ST + CT + OT + NTT^c. \tag{26}$$

Finally, the consolidated budget of the whole system can be represented indistinctively in the three following equivalent forms:

$$E = R + D, \tag{27.1}$$

$$E^f + E^{nf} + E^c = T^f + T^{nf} + T^c + RR^c + D, \tag{27.2}$$

$$EA + EB + EC = ST + CT + OT + NTT^c + RR^c + D. \tag{27.3}$$

Given that normatively the two autonomous jurisdictions are in equilibrium, the deficit of the whole system, the consolidated deficit *D*, must be identical to the deficit of the central government. That is, the deficit can be measured as $D = E - R$, as indicated in (27.1), but also as the difference between total expenditure minus total revenue of the central government,

$$D = \left(E^c + S\right) - \left(R^c + C\right),$$

as can be seen by substituting in this expressions the definitions of *S* and *C* given above. Also, consistently with the definition of expenditures and revenues of the central government, the deficit *D* takes the widest form possible, including the financing operations described above. Technically, *D* is the gross issue of financial liabilities needed to finance the budget.

4. CORRECT AND LEGAL CUPOS

4.1. What is wrong with the legal definition of the cupo?

Is the legal definition of the cupo —expression (22)— correct? To answer this question we need to ascertain to what extent each of the three elements in (22) —iNE^{cf}, iNR^{cf} and iND^f— are good estimators of respectively E^{cf}, R^{cf} and D^f, the three elements of (20).

Using (23) and (25), the *reference* (correct) cupo defined in (20) can be expressed as

$$C = \alpha EA - \beta\left(NTT^c + RR^c\right) - \left(\alpha E - \beta R\right), \tag{28}$$

where $E = EA + EB + EC$ and $R = ST + CT + OT + NTT^c + RR^c$. On the other hand, starting from (22) and using the rules of calculation prescribed in the law, we find that the *actual* (legal) cupo is

$$C^L = iEA - i\left(NTT^{cL} + RR^{cL}\right) - i\left[\left(1+\pi\right)E - R\right], \tag{29}$$

where NTT^{cL} and RR^{cL} are the measures of the revenue of not transferred central government taxes and non-tax central revenue considered by the legal cupo; and π, expressed as a fraction of *E*, is the resource premium (extra expenditure capacity) that the legal definition of the cupo bestows on the foral community as compared to the reference definition. Clearly, the reference and legal expressions are not the same: there are differences regarding imputation coefficients and differences caused by the specification of the second and third terms.

To explain the procedure to obtain (28), and at the same time have a whole picture of the system in terms of the different types of expenditures and taxes, it is useful to start from the consolidated budget constraint (16), and the definitions of the deficits imputed to the foral (17) and non-foral (18) jurisdictions, which for commodity we repeat here:

$$\left(T^{f}-E^{f}\right)-\left(E^{nf}-T^{nf}\right)=\left(E^{cf}-R^{cf}-D^{f}\right)+\left(E^{cnf}-R^{cnf}-D^{nf}\right),$$

where

$$D^{f}=E^{tf}-R^{tf}=\left(E^{f}+E^{cf}\right)-\left(T^{f}+R^{cf}\right),$$

and

$$D^{nf}=E^{tnf}-R^{tnf}=\left(E^{nf}+E^{cnf}\right)-\left(T^{nf}+R^{cnf}\right).$$

Then, using equations (23) and (25), the four elements of the consolidated budget constraint can be expressed as follows:

$$\left(T^{f}-E^{f}\right)=\beta\left(ST+CT+OT\right)-\alpha\left(EB+EC\right), \tag{30}$$

$$\left(E^{nf}-T^{nf}\right)=\left(1-\alpha\right)EB-\left(1-\beta\right)\left(\gamma ST+OT\right), \tag{31}$$

$$\left(E^{cf}-R^{cf}-D^{f}\right)=\alpha EA-\beta\left(NTT^{c}+RR^{c}\right)-\left(\alpha E-\beta R\right), \tag{32}$$

$$\begin{aligned}\left(E^{cnf}-R^{cnf}-D^{nf}\right)=&\left(1-\alpha\right)\left(EA+EC\right)\\&-\left(1-\beta\right)\left[\left(1-\gamma\right)ST+CT+NTT^{c}+RR^{c}\right]\\&-\left[\left(1-\alpha\right)E-\left(1-\beta\right)R\right].\end{aligned} \tag{33}$$

Expressions (30) and (31) measure respectively the *direct* forms of *C* and *S*, and expressions (32) and (33) the corresponding *indirect* forms. As can easily be checked, $(30)=(32)$ and $(31)=(33)$. The *reference* cupo (28) is therefore expression (32).

Perhaps the most intriguing question about the cupo is why the deficit has to be defined in such an ample manner. More to the point: what is the purpose of the absurd redundancy involved with the indirect measure of the cupo? This affects both the correct and the legal cupos; let us illustrate the issue with the correct cupo. Using the definitions of *E* and *R* given above, expression (28) reads

$$\begin{aligned}C=&\alpha EA-\beta\left(NTT^{c}+RR^{c}\right)-\alpha\left(EA+EB+EC\right)\\&+\beta\left(ST+CT+OT+NTT^{c}+RR^{c}\right).\end{aligned}$$

Clearly, there are a lot of redundant variables.[18] Indeed, if we cancel out all of them, we are left with the direct form of measuring the cupo:

$$C = \beta\left(ST + CT + OT\right) - \alpha\left(EB + EC\right) = T^{f} - E^{f}.$$

But even if, for whatever reason, the indirect form is preferred, there is plenty of room to define all three terms of (28) much more parsimoniously: both NTT^{c} and RR^{c} can be cancelled out in the not transferred revenue term and in the revenue side of the deficit term; and *EA*, which includes all the financial operations of the central government, can be likewise narrowed down by excluding these operations both in the not assumed charges term and in the expenditure side of the deficit.

The use of the deficit in the definition of the cupo, and the form that this deficit should take, has been the subject of controversy in the academic literature. Monasterio (2010) takes the position that the scope of the deficit used by the legal cupo is too large. In particular, he considers that the variation of financial assets and liabilities should be no part of the relevant deficit. De la Fuente (2011), on the other hand, accepts the scope of the deficit and points out that the relevant issue is not so much the scope as the consistency between the deficit and the definition of expenditure. Since the net purchase of financial assets and debt amortization charges are included in the legal definition of not assumed expenditure, it is consistent that these items should also figure in the deficit definition. Both are right. As we have just seen, in (28) the scope of the deficit definition is correct, but both expenditure and revenue could be usefully restricted providing that consistency is maintained.

4.2. The correct and legal cupos compared

For reference purposes, and to use the terminology of the legal cupo, let us call the three terms in expressions (28) and (29): the "not assumed expenditure" element; the "not concerted revenue" element and the "deficit" element. Subtracting (29) from (28), $C - C^{L}$, we have a measure of the extent to which the correct cupo exceeds the legal cupo, and thus an estimate of the overprovision of resources that the foral jurisdiction enjoys as compared to the non-foral jurisdiction. This difference is, in its turn, generated by a not assumed expenditure effect, a not concerted tax effect and a deficit effect.

In particular, the not assumed expenditure effect is

$$\left(\alpha - i\right) EA, \tag{35}$$

which is clearly negative since $\alpha < i$. Therefore, the legal cupo overestimates the not assumed expenditure element of the reference cupo. This is at variance with previous results in the literature. Castells et al. (2005) and De la Fuente (2011) conclude that the legal cupo underestimates this element, among other things because the legal cupo does not take into

[18] The origin of the redundancy lies with the indirect form of measuring the cupo and the implied need of introducing an endogenous variable such as the deficit.

account the amount S that the central jurisdiction transfers to the non foral jurisdiction. But, as seen in (28), it is correct that S should not appear in this term. Indeed, transfers should be no part of the definition of expenditure responsibilities as they are essentially different. As the consolidated budget shows, within the limits of the system, transfers do not use up resources, they simply move them from one jurisdiction to another to redistribute expenditure capacity (that is, capacity to use up resources).

The not concerted revenue effect is

$$-(\beta - i)\left(NTT^{c} + RR^{c}\right) + i\left[\left(NTT^{cL} + RR^{cL}\right) - \left(NTT^{c} + RR^{c}\right)\right]. \tag{36}$$

The first term measures the effect of the difference in imputation coefficients; and the second, the effect of the difference between the measure of non-concerted revenue used by the law and the correct not concerted revenue measure implied by the model. Given the proximity of coefficients β and i, the first term is bound to be small, while the value of the second depends on the difference between the legal and correct measures of not concerted revenue.

Finally, the deficit effect is

$$-(\alpha - i)E + (\beta - i)R + i\pi E. \tag{37}$$

Since $\alpha < i$ and consolidated expenditure E is positive and large, the first component of this expression is bound to be positive and large. Given that $\beta < i$, the second component must be negative but, given the similarity of these two parameters, small. The third component, given the multiplication of two fractions, $i\pi$, must be positive and also small.[19]

5. EMPIRICAL ESTIMATION

The empirical estimation of the model is not a straightforward matter. The foral system, contrary to what happens with the non foral system, provides a very limited amount of public information regarding the way in which the numerical evaluation of the different elements of the model are arrived at. Nevertheless, the data needed to estimate the model developed here are readily available: BOE (2007b and 2007c) give the required information to estimate the foral system as applied in the Basque Country and Navarre; the data on regional finance for non-foral autonomous communities are in MINHAP (2013b); and the Spanish state budget can be found in MINHAP (2013a). With these sources we present an empirical

[19] The upshot of this comparison is that the two most significant elements are the not assumed expenditure effect (35) and the first component of the deficit effect (37). That is, under these simplifying assumptions, $C - C^{L} = (\alpha - i)EA - (\alpha - i)E = (\alpha - i)(EA - E)$. This is the strategy followed in López-Laborda (2007) to measure the difference between the transfer to the non-foral jurisdiction and the foral cupo. In terms of our model, from (24), $EA - E = -(EB + EC) = -NE^{f}$, the national equivalent of the "assumed charges". Thus, the most significant part of the difference between C and C^{L} can be measured as $C - C^{L} = -(\alpha - i)NE^{f}$, which essentially is the result obtained by López-Laborda (2007). Given that $\alpha < i$ and foral expenditure large, this is clearly positive and large: the legal cupo significantly underestimates the correct cupo.

estimation of the model for 2007, which corresponds to the last year in which the foral system was specified.[20]

The strategy is as follows: First we identify the reference position of the whole regional finance system, against which the actual legal cupo of the foral jurisdiction can be compared. As shown above, the reference position is defined so that, for equal responsibilities, normative expenditure per capita of the foral jurisdiction is the same as average normative expenditure per capita of non-foral jurisdiction. We deem this reference as one in which privilege for the foral jurisdiction is absent and therefore compliant with the legal requirements of the Spanish Constitution.

In defining the reference position we aim for consistency between different jurisdictions, and thus follow strictly the formal model above. An implication of the assumptions of the model is that there are no problems with the actual allocation of tax revenue to each jurisdiction and therefore that no adjustments are needed to transform actual revenue obtained within the territory of the community in question into accrued revenue according to the nature of the tax. In reality, in addition to the cupo, there are other transfers aimed at this purpose, which, consistently with the way tax revenue is imputed to each jurisdiction, we ignore in the present model and concentrate exclusively on the differences that may arise between the reference cupo and the legally prescribed cupo.[21]

The Annex to this article specifies again the model of the Spanish regional finance system presented above, this time enlarged to two foral jurisdictions —Basque Country and Navarre— in order to make it more readily applicable to the actual Spanish organization of regional finance. Given the purpose of the exercise, we do not decompose the non-foral jurisdiction into the fifteen autonomous communities of which it is composed. The Annex also details the procedure to estimate the different concepts of the model using available data. Here, in the main text, we present and discuss the results obtained.

5.1. Reference and actual positions

Reference position

Table 1, using the estimates shown in Section A.2 of the Annex, shows the position of reference that will be used in this exercise. It includes the budget of the three autonomous

[20] As with the non-foral system, the foral one undergoes a major revision about every five years and in the interim is annually updated according to some agreed rule. The last year in which this major revision took place in the Basque Country was 2007, and in Navarre 2005. Our results below on foral privilege are calculated for the base year of the 2007 Basque Country revision (and the 2005 Navarre revision, expressed in 2007 euros). This, however, does not change the estimated privilege differences as the rule that updates the foral system is practically the same as the one that updates the non-foral system.

[21] A particular transfer that presents serious problems is the one destined to adjust VAT tax revenue from the production base under which it is collected to the consumption base under which it accrues. See Zubiri (2007), Monasterio (2010), De la Fuente (2011) and Zabalza (2012).

jurisdictions, the budget of the central jurisdiction and the consolidated budget of the whole system of regional finance.

Expenditure per capita in the two foral jurisdictions, €4,327 in the case of the Basque Country and €3,701 in the case of Navarre, is the result of €2,685 received on account of the *EB* responsibilities that they share with the non-foral jurisdiction, plus €1,015 received on account of the *EC* specific responsibilities held by the two foral communities, plus €626 on account of the *ED* responsibilities held exclusively by the Basque Country. Therefore, in this comparison, where all jurisdictions are at their reference position, the 61.1% excess of resources that the Basque Country enjoys over the non-foral communities, and the 37.8% excess held by Navarre, have to be seen as excesses justified by the larger set of expenditure responsibilities they hold. Put differently, these excesses comply with the legal requirement of absence of privilege disposed by the Spanish Constitution.

Table 1. The Spanish system of regional finance. Year 2007
Reference position of the cupos: expressions (A.14) and (A.16)
(Million €)

	Jurisdiction				
	Basque C.	**Navarre**	**Non Foral**	**Central**	**Consolidated**
Expenditure	9,267	2,242	114,003	155,803	281,314
Revenue	14,106	3,839	81,388	144,500	243,832
C	4,839	1,597		6,436	0
S			32,615	32,615	0
Deficit	0	0	0	37,482	37,482
E/N (€/*N*)	4,327	3,701	2,685	3,447	6,224
T/GDP (%)	21.7	21.7	8.4	14.1	22.5

E: Expenditure; *N*: Population; *T*: Tax revenue; *GDP*: Gross Domestic Product

Subject to the assumptions used to estimate tax revenue figures, the foral jurisdictions' average effective tax rate over *GDP* would be 21.7%, somewhat lower than both the sum of non-foral and central jurisdictions' effective rates (22.5%), and the overall national effective rate (22.5%).

Actual position

The actual position is shown in Table 2, where the cupos of the Basque Country and Navarre, instead of being calculated with the correct expressions (A.14) and (A.16), are calculated with the legally prescribed formulas (A.15) and (A.16).

Table 2. The Spanish system of regional finance. Year 2007
Actual position of the cupos: expressions (A.15) and (A.16)
(€Million)

	Jurisdiction				
	Basque C.	**Navarre**	**Non Foral**	**Central**	**Consolidated**
Expenditure	12,025	2,874	114,003	155,803	284,704
Revenue	14,106	3,839	81,388	144,500	243,832
C	2,081	965		3,046	0
S			32,615	32,615	0
Deficit	0	0	0	40,872	40,872
E/*N* (€/*N*)	5,614	4,744	2,685	3,447	6,299
T/*GDP* (%)	21.7	21.7	8.4	14.1	22.5

E: Expenditure; *N*: Population; *T*: Tax revenue; *GDP*: Gross Domestic Product

Two comments are in order concerning these two legal cupos. First, whereas the values in the Basque cupo are exactly the ones of year 2007 that figure in BOE (2007b), the values of the Navarre cupo are updated from the 2005 values that figure in BOE (2007c). EN^{cnL} is estimated as the 2005 value times the total budget expenditure growth factor between 2005 and 2007 (1.1604). We thus keep unchanged the structure between EN^{cnL} and E^{c} that BOE (2007c) gives, which differs from the one used in the case of the Basque Country cupo. No such difference arises for not transferred revenues and the deficit, so the same 2007 figures are used in both cases.

Second, we only consider the *cupo* affected by the imputation coefficient. To this, the legally calculated cupos add other adjustments (the most important of which concerns direct taxes) for a total value of -€516 million in the Basque Country case and -€123 million in the Navarre case. Consistently with our assumption above that the reference tax figures are correctly allocated to each territory, we ignore these adjustments in what follows.

Table 2 shows how in 2007 the whole regional finance system must have looked like with these legal cupos. In fact, Table 2 presents the actual 2007 observed position for central and non-foral jurisdictions, the actual legal cupos and, given normative revenue, the implied normative levels of expenditure. Since the legal cupos are lower than the correct ones, normative values of expenditure of the foral communities are larger than in the reference position, and so is the deficit of the system. The way the reference position has been defined, the deficit of the actual position is precisely the actual 2007 budget deficit of the central jurisdiction[22].

[22] Since by assumption we keep revenue of all four jurisdictions, and expenditure of all jurisdictions except the foral ones, unchanged, the extra resources assigned to foral communities are all absorbed by the deficit of the system. With this, we ensure the correspondence between the actual position of Table 2 and observed data. See also that, since decentralized budgets enter into the model only in normative terms, and thus without deficits, the consolidated deficit coincides with the central deficit.

5.2. Foral privilege and its sources

Foral privilege

With the legally prescribed cupos, the Basque Country obtains €5,614 per capita and Navarre €4,744 per capita, while the non-foral jurisdiction obtains €2,685 per capita. The Basque Country has 109.1% and Navarre 76.7% more resources per capita than those of the non-foral jurisdiction. Of these excesses, and as we have seen above, 61.1% is justified by the larger set of the Basque Country expenditure responsibilities, and 37.8% by those of Navarre.

Therefore, as Table 3 shows, the unjustified excess, the economic privilege that the foral system enjoys over the non-foral system of regional finance, is 29.8% in the case of the Basque Country and 28.2% in the case of Navarre. In all, the two foral communities enjoy 29.5% more resources per capita than the foral communities. These are the unjustified differences in resources that result from the comparison between expressions (A.14) and (A.15) for the Basque Country and (A.16) and (A.17) for Navarre.

Table 3. Economic privilege of the foral system
Excess of resources per capita over those of non-foral system
(Percentages)

	Basque C.	Navarre	BC+N
Total excess	109.1	76.7	101.9
Justified excess*	61.1	37.8	56.0
Unjustified excess	29.8	28.2	29.5

* Justified because of the larger set of expenditure responsibilities of foral over non-foral jurisdictions

Sources of the foral privilege

Having empirically estimated the model, we can now evaluate the components of these differences. Beginning with the Basque Country, the difference between reference and legal cupos, $C^{bc} - C^{bcL}$, is €2,758 million. The legal cupo (€2,081 million) is 57.0% smaller than what it should be (€4,839 million). With reference to Table 4, the not assumed charges effect is −€1,288 million. On this account, therefore, legal provisions overestimate the Basque Country cupo. The same, although with a much smaller absolute size (−€263 million), occurs with the not concerted revenue effect, which is generated in its practical totality by the difference between the revenue of not transferred taxes considered in the legal definition of the cupo and the revenue that for these taxes figures in the 2007 central government budget. Finally, the deficit effect is €4,309 million, thus meaning that these same legal provisions, in net terms, severely underestimate the cupo of this autonomous community. In all, the legal cupo of the Basque Country is €2,758 million smaller than what it should be if the normative resources per capita of this community were, for equal responsibilities, the same as those of the non-foral jurisdiction. The three effects correspond respectively to expressions (35), (36) and (37).

The above results are in agreement with Monasterio (2010), for whom the main problem lies in the existence of a sizeable deficit effect, but not with De la Fuente (2011), who does not consider the deficit element as a source of foral privilege and puts all the cause of this privilege on the not assumed charges effect. Notice also that, somewhat surprisingly if we are to follow previous results, the legal cupo overestimates, rather than underestimates, the not assumed charges element, the effect being caused exclusively by the difference in the imputation coefficients. But this overestimation is more than compensated by the underestimation of the deficit element, which is again caused by the different imputation coefficients used on consolidated expenditure.

Table 4. Decomposition of the difference between reference and legal cupos in the Basque Country
(€million)

1. Not assumed charges effect	
$(\alpha_{bc} - i_{bc})EA$	-1,288
Total 1st effect	-1,288
2. Not concerted revenue effect	
$-(\beta_{bc} - i_{bc})(NTT^{c} + RR^{c})$	8
$+i_{bc}\left[(NTT^{cL} + RR^{cL}) - (NTT^{c} + RR^{c})\right]$	-272
Total 2nd effect	-263
3. Deficit effect	
$-(\alpha_{bc} - i_{b})E$	4,224
$+(\beta_{bc} - i_{bc})R$	-126
$+i_{bc}\pi E$	212
Total 3rd effect	4,309
Total $C^{bc} - C^{bcL}$ difference (1+2+3)	2,758

Table 5 shows the decomposition for the case of Navarre. Although with much lower absolute numbers, we see that the general pattern of effects is similar to that found for the Basque Country. Again, the not assumed charges effect is negative, −€275 million; the not concerted revenue effect is also negative but relatively small in absolute terms, −€83 million; and by far the largest is the deficit effect, €990 million. In total, the legal Navarre cupo (€965 million) is 39.6% smaller than what it should be (€1,597 million) if the normative resources per capita of this community were, for equal responsibilities, the same as those of the non-foral jurisdiction.

Table 5. Decomposition of the difference between reference and legal cupos in Navarre
(€million)

1. Not assumed expenditure effect	
$(\alpha_n - i_n)EA$	-223
$+\left[\alpha_n(1-i_n) - i_n\alpha_{nf}\right]ED$	-52
Total 1st effect	-275
2. Not concerted revenue effect	
$-(\beta_{bc} - i_n)\left(NTT^c + RR^c\right)$	-13
$+i_n\left[\left(NTT^{cL} + RR^{cL}\right) - \left(NTT^c + RR^c\right)\right]$	-70
Total 2nd effect	-83
3. Deficit effect	
$-(\alpha_n - i_n)E$	730
$+(\beta_n - i_n)R$	205
$+i_n\pi E$	54
Total 3rd effect	990
Total $C^n - C^{nL}$ difference (1+2+3)	632

5.3. Comparison with other results

As Table 6 shows, the unjustified excess of resources that Spanish foral communities enjoy over the non-foral communities is 29.8% in the case of the Basque Country and 28.2% in the case of Navarre. We feel that our approach contributes decisively to the understanding of the relationship between foral, non-foral and central jurisdictions, and offers a very complete picture of the whole system of regional finance. It also allows us to model very precisely the reference cupo, and thus to estimate with some confidence the privilege over common regime communities enjoyed by the two foral jurisdictions and the sources of this privilege. Leaving aside the different years to which these exercises refer and the different approaches used, our exercise yields estimates which are below those found by other authors. The difference is not very large with respect to Buesa (2007 and 2009) and Monasterio (2010) (-6.6% and -9.1% respectively), but quite significant with respect to Zubiri (2007) and De la Fuente (20011) (-53.4% and -36.3% respectively).

The difference between our and Zubiri's results is in part due to the fact that his estimates include the effect of the VAT adjustment. Although Zubiri's paper gives no information on the extent of this effect, if we assume that it explains 14.5% of excess resources per capita ─following the Monasterio (2010) estimate, which also refers to the year 2002─ then the Zubiri's measure of the foral privilege of the Basque Country, net of the VAT effect, would be a 43.2% excess of resources per capita, which is closer to our result. Regarding the difference with De la Fuente's result, account must be taken of the fact that our

estimates are mainly generated by the deficient design of the legal cupo rather than by presumed deficiencies of official data. This author shows that the use of hypothetical data to correct these deficiencies can generate fairly large estimates of the foral privilege, but then one is left with the doubt as to whether the use of this hypothetical data is justified. So we have preferred to stick with the official data and see how far we could go in the estimation of foral privilege simply on account of the design faults that the legal cupo surely has[23].

Table 6. Comparison with other estimates of foral privilege
Excess of resources per capita over non foral system
(Percentages)

	Table 3[1]	Zubiri[2]	Buesa[3]	Monasterio[4]	De la Fuente[5]
BC total	109.1		112.5	114.0	97.6
N total	76.7		88.8		
BC+N total	101.9		107.3		
BC unjust.	29.8	64.0	31.9	32.8	46.8
N unjustified	28.2	65.0	37.9		
BC+N unjust.	29.5	65.0	32.9		

[1] Year 2007.

[2] Zubiri (2007). Year 2002. Original estimates of excess in terms of resources per capita. These estimates include the effect of the VAT adjustment.

[3] Buesa (2007) for Basque Country cupo (year 2007) and Buesa (2009) for Navarre cupo (year 2005). Original estimates in terms of cupos privilege, which are applied to reference position (Table 1) to convert the excess into resources per capita. Net of effect of the VAT adjustment.

[4] Monasterio (2010). Year 2002. Original estimate in terms of cupo privilege, which is applied to reference position (Table 1) to convert the excess into resources per capita. Net of effect of the VAT adjustment that would explain an additional 14.5% of excess of resources per capita.

[5] De la Fuente (2011). Year 2007. Original estimate of excess in terms of resources per capita. Net of effect of the VAT adjustment that would explain an additional 8.2% of excess resources per capita.

6. HORIZONTAL EQUITY IN THE CUPO SYSTEM

The cupo system has been often characterized in the literature by its lack of solidarity *vis-à-vis* the non-foral and central jurisdictions. Since it is not obvious what it is meant by, or how to define, the term "solidarity", we approach the issue taking a territorial stance: Is the foral territory exempt from contributing to the financing of the rest of the nation? Given that, as shown above, $(30)=(32)$ and $(31)=(33)$, one might indeed infer that both the foral and common systems are self-contained, in that their only purpose is to cater for their own needs. The purpose of this section is to show that with the *correct* cupo this is not the case.

Take the central government budget from (14.3)[24]

[23] The only cases where a discrepancy between the data used by the legal cupos and the data implied by our model has been detected refer to not concerted revenue. For both foral communities, as Tables 4 and 5 show, the absolute effect of this discrepancy (around 10.5%) is relatively small.

[24] The same results would be obtained starting from the consolidated budget constraint (13).

$$E^c + S = R^c + C + D,$$

And substitute (23.3) for E^c, (31) for S, (25.3) for R^c, (32) for C and (15.3) for D. Then gather those expenditure items affected by the coefficient α and those affected by the coefficient $(1-\alpha)$. The first correspond to expenditure that has taken place in the foral region and the second to expenditure in the non-foral region. Then do the same with those revenue items affected by the coefficient β and those affected by the coefficient $(1-\beta)$, which will identify revenue raised or imputed to the foral region and to the non-foral region respectively. Doing that, we obtain

$$(\beta R - \alpha E) + \left[(1-\beta)R - (1-\alpha)E\right] = R - E. \tag{38}$$

The first parenthesis is the financial contribution to the nation by the foral region, which under our assumptions is positive. The term in square brackets corresponds to the financial contribution to the nation by the non-foral region, which is negative. And the term on the right hand side of the equality sign is the central government surplus, which is negative. Expression (38) shows how the two vertical gaps of the economy are related to each other. The foral region, which is the relatively rich region, contributes to finance the shortfall of the non-foral region plus the central government deficit. Both regions stand on equal terms as far as solidarity, the sign of the regional flows being determined by relative income. This is quite independent of the regional finance system applied to each region. All that matters is relative income per unit of need. If there was another foral community that was relatively poor, its vertical gap would be negative and would therefore be financed by the rest of the regions. Likewise, if there was another non-foral community that was relatively rich, its vertical gap would be positive and would be a net financial contributor to the rest of the regions.

These nice properties break down with the *legal* cupo. Indeed, if we repeat the exercise with the present form of the cupo, the regional balances expression is

$$\left\{\beta R - \left[\alpha E + \left(C - C^L\right)\right]\right\} + \left[(1-\beta)R - (1-\alpha)E\right] = \left\{R - \left[E + \left(C - C^L\right)\right]\right\}. \tag{39}$$

The legal cupo allows the foral territory to use up more resources than those justified by its needs, and to that extent establishes an economic privilege with respect to the non-foral territory. Also, under the implicit assumption used in (39), this extra consumption is absorbed by a larger national deficit.

In conclusion: the cupo form *per se*, the indirect manner of measuring the transfer, is completely neutral; the foral jurisdiction is as "solidary" as the non-foral jurisdiction. What really matters is the particular way in which this indirect form is measured; the particular imputation procedure established by the law, which clearly biases the scales in favour of the foral and, therefore, against the non-foral jurisdiction.

The first row of Table 7 measures expression (38) for the three jurisdictions considered in this exercise. With the *correct* cupos, the foral jurisdictions are both net

contributors to the financing of the non-foral jurisdiction. Globally (that is, considering not only revenues and expenses of the autonomous community but also those made in, or imputed to each of the foral regions by the central government) public revenue is greater than public expenditure: The difference is €1,758 million for the Basque Country (2.7% of its GDP) and €336 million for Navarre (1.9% of its GDP). They contribute in all €2,094 million to the financing of the non-foral region, despite which the nation still generates a −€37,482 million deficit (3.6% of GDP).

Table 7. Spanish regional balances; 2007
(Million €)

	BC	N	Non-foral	Nation (*R-E*)
With correct cupos	1,758	336	-39,576	-37,482
With legal cupos	-999	-296	-39,576	-40,872
With correct cupos (%GDP)	2.6	2.0	-4.1	-3.6
With legal cupos (%GDP)	-1.5	-1.7	-4.1	-3.9
Gain/Loss with legal cupos	2,758	632	0	-3,390
(Gain/Loss)/GDP (%)	4.2	3.6	0	-0.3

Things change completely with the *legal* cupos. The corresponding regional balances are measured, with expression (39), in the second row of the table. Now both the Basque Country and Navarre are *net beneficiaries*: €999 million for the Basque Country (1.5% of its GDP) and €296 million for Navarre (1.7% of its GDP). In this respect, therefore they are not different from the non-foral jurisdiction, which is also a net beneficiary with €39,576 million (4.1% of its GDP). This is clearly an unexpected outcome given the larger per capita rent of the two foral jurisdictions relative to the non-foral one, and is clearly the result of the economic privilege enjoyed by these two communities. In terms of GDP per capita, the Basque Country, with 30,419 Euros per capita is 30.6% richer than the Spanish mean (€23,293), Navarre 25.6% richer, and the non-foral jurisdiction, itself formed by 15 autonomous communities, 1.9% poorer with 22,848 Euros per capita. The position of the foral regions contrasts with that of Madrid and Catalonia, two other relatively rich Spanish regions. Under the assumptions of our model, Madrid (31.7% richer than the mean) and Catalonia (17.4% richer) would be net contributors for €5,313 million and €757 million respectively.[25]

[25] Recall the extensive way in which the budget is measured by the law, which includes the purchase and sale of financial assets, and the purchase of financial liabilities. That is, a budget definition which implies that the deficit is the sale of financial liabilities (i.e., gross issue of public debt during the budget year). Had the definition been exclusively in terms of non-financial operations, the deficit would be significantly smaller (in fact, for 2007, the non-financial deficit was negative: a surplus of €3,620 million), with a corresponding change of the different regional balances. As an illustration, assuming that the differences $C - C^L$ remains the same as in Table 7, the regional balances with the *correct* cupo would be €2,296 million for the Basque Country, €552 million for Navarre, €772 million for the non-foral jurisdiction and a national surplus of €3,620 million. With the *legal* cupo, assuming that $C - C^L$ remains the same as in Table 7, the corresponding balances would be −€462, −€80,

The gain that the two foral communities enjoy as a result of the legal cupo is therefore significant (€2,887 million for the Basque Country and €632 million for Navarre; equivalent respectively to 4.2% and 3.6% of their GDP), as is the corresponding loss for the nation, reflected in the table as an increase of €3,390 million in its public debt (0.3% of its GDP).

7. NORMATIVE IMPLICATIONS

The model developed here has well defined normative implications regarding the design of the cupo. Clearly, if we want the cupos to comply with the Spanish Constitution, the most direct and simple definition is given by the first two equations (A.4), which we repeat here

$$C^{bc} = T^{bc} - E^{bc},$$

and

$$C^{n} = T^{n} - E^{n},$$

and which, as indicated above, should be imputed as follows:

$$C^{bc} = \beta_{bc} T^{a} - \alpha_{bc} E^{a}$$
$$C^{n} = \beta_{n} T^{a} - \alpha_{n} E^{a}$$

The two foral communities may find it politically difficult to accept the direct formulas (A.4), even if they acknowledge that the cupo should not generate unjustified economic advantages over other communities, as that would represent a formal departure from the traditional, indirect definition. So, a second suggestion is given by equations (A.5), which allow the traditional interpretation of the cupo as a payment to the central jurisdiction for the services rendered to the foral communities.

Being an indirect method, however, care has to be taken to correctly define and measure E^{cf} and T^{cf}. The correct procedure to find out NE^{cf} is to subtract NE^{f}, $(f = bc, n)$, not from the total expenditure budget of the central jurisdiction (as the law prescribes), but from the total expenditure of the whole consolidated system, *E*. Indeed, doing that, in the Basque Country case we have

$$\begin{aligned} NE^{cbc} &= E - NE^{bc} \\ &= EA + EB + EC + ED - \left(EB + EC + ED\right) \\ &= EA, \end{aligned}$$

which is the right measure of the national equivalent of those expenditure responsibilities not held by the Basque Country. And in the case of Navarre,

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€772 and €230 million. The non-foral territory contributes not only to the financing of the legally created deficits of the two foral communities, but also to the reduction of the national public debt by €230 million. Notice that these figures are perfectly consistent with a balance of gains and losses that, by assumption, would be the same as those shown in the last two rows of table 7.

$$
\begin{aligned}
NE^{cn} &= E - NE^{n} \\
&= EA + EB + EC + ED - \left(EB + EC\right) \\
&= EA + ED,
\end{aligned}
$$

which again retrieves the national equivalent of the responsibilities not held by this autonomous community. The use of the central government budget, given the presence in this budget of the transfers of the system, is fraught with dangers that can only be avoided through the use of cumbersome expedients such the introduction of the article 4.3.b of BOE (2007b) for the case of the Basque Country, or of article 54.2.b of BOE (2007c) for the case of Navarre.

Regarding the not concerted revenue element, its definition must be exactly the same as that in the revenue side of the deficit. Otherwise, as the present legal cupo does, an inconsistency is introduced.

Finally, the most troublesome question that the indirect form of the cupo has to deal with is the definition of the deficits D^{f}, $(f = bc, n)$, which should follow the formulation given in (A.6). In terms of the consolidated values of expenditures and revenues, we have shown that the correct imputation of these deficits to the two foral communities is

$$D^{f} = \alpha_{f} E - \beta_{f} R, \qquad (f = bc, n).$$

That is, under the assumptions of the present model, consolidated expenditure has to be weighted by relative population, and consolidated revenue by relative income.[26]

Summarizing, if the indirect imputation route to the definition of the cupos wants to be followed, the correct definitions are (A.14) and (A.16), which for ease of reference we repeat here,

$$C^{bc} = \alpha_{bc} EA - \beta_{bc}\left(NTT^{c} + RR^{c}\right) - \left(\alpha_{bc} E - \beta_{bc} R\right),$$

and

$$C^{n} = \alpha_{n}\left(EA + ED\right) - \beta_{n}\left(NTT^{c} + RR^{c}\right) - \left(\alpha_{n} E - \beta_{n} R\right).$$

All the needed data is readily available to estimate these expressions, and there is no excuse not to use them instead of the actual, incorrect and, from an equity point of view, unsatisfactory alternatives (A.15) and (A.17).[27]

[26] Another, altogether different issue is the scope of the deficit. Nothing prevents the use of a consolidated definition of the deficit excluding financial operations, as Monasterio (2010) advocates, provided that consistency in the definition of the other terms of the cupo is kept.

[27] On reform proposals of the cupo system, see also Castells et al. (2005) and López-Laborda (2007).

8. CONCLUSION

This is a long paper and it may prove convenient to recapitulate in order to summarize the main results of the exercise.

We have shown that, in principle, the cupo is nothing more than an indirect form of measuring the equalising transfer between the central government and the corresponding autonomous jurisdiction. If expenditure needs are defined consistently over the whole system, the cupo form *per se* ─the indirect manner of measuring the transfer─ is completely neutral: the foral jurisdiction operates exactly under the same financial conditions as the non-foral jurisdiction, despite that in the latter case the transfer is directly measured.[28] What really matters is the particular way in which this indirect form is measured; the particular imputation procedure established by the law, which clearly biases the scales in favour of the foral and, therefore, against the non-foral jurisdiction.

We feel that our approach contributes decisively to the understanding of the relationship between foral, non-foral and central jurisdictions, and offers a very complete picture of the whole system of regional finance. It also allows us to model very precisely what would be the position of this system if the cupo was measured by means of an imputation procedure that gave no economic advantage to the foral communities. We have termed this the *correct* cupo, which is the appropriate reference with respect to which the privilege of the actual, *legal* cupo has to be assessed. Our results for the Basque Country indicate that out of a 109.1% observed excess of resources per capita, an excess of 61.1% is justified by differences in responsibilities between the Basque Country and the non-foral jurisdictions, leaving the unjustified excess ─the economic privilege of the Basque Country versus the non-foral communities─ at 29.8%. The corresponding figures for Navarre are 76.7% of observed excess, 37.8% of excess justified by differences in responsibilities, and 28.2% of unjustified excess. These estimates of the foral economic privilege are in general smaller than those previously obtained in the literature. The difference is not very large with respect to Buesa (2007 and 2009) and Monasterio (2010) (-6.6% and -9.1% respectively), but quite significant with respect to Zubiri (2007) and De la Fuente (20011) (-53.4% and -36.3% respectively).

The unjustified gain that the two foral communities enjoy comes, practically all of it, from the use of imputation coefficients which are different from the ones that would correspond to a correctly designed cupo. Despite that the difference between the correct and legal imputation coefficients is in itself small, the basis to which these differences are applied are so large, that the resulting economic advantage obtained by the foral communities is very significant. Our finding is that, of the three elements of the cupo, the deficit effect is the only

[28] As a matter of fact, the Spanish foral communities have responsibilities over a much larger fiscal base than the non-foral jurisdictions. This can potentially give them more cash flexibility than that enjoyed by non-foral communities, but this has nothing to do with the form in which the transfer is specified. It is just a consequence of the political decision of granting more tax responsibilities to the foral than to the non-foral communities.

contributor to the unjustified foral gain, the other two effects counteracting to some extent this gain.

Our exercise has clear implications for reform, a matter particularly delicate in the case of the foral system as the Spanish Constitution "protects and respects" these traditional arrangements for the Basque Country and Navarre. But we feel that this acknowledgement of the existence of the foral system is not sufficient to guarantee the persistence of an economic gain with respect to the non-foral jurisdictions. The Spanish Constitution, at the same time that "protects and respects" the foral system, requires that no Autonomous Community (including the two foral communities) should enjoy economic advantages on account of their financing arrangements. These two pieces of provisions can only be accommodated by, on the one hand, accepting the much larger degree of tax capacity that foral communities presently enjoy, but, on the other, redefining the actual cupo so that it gives the foral community the same amount of resources per unit of need as that of non-foral communities. From a technical point of view this is perfectly possible as we have shown in this paper. Also, it is relevant to know that the laws that establish the overall financial relationship between the central government and the foral communities, and that define the cupo, are ordinary laws that can be changed by other ordinary laws.

ANNEX

A.1 Model with two foral communities: Basque Country and Navarre

The model

Considering two foral jurisdictions instead of one involves a straightforward extension of the model developed in Sections 2 and 3 of the main text. The consolidated budget is now

$$E^{bc} + E^{n} + E^{nf} + E^{c} = T^{bc} + T^{n} + T^{nf} + T^{c} + RR^{c} + D, \tag{A.1}$$

where E^{bc}, E^{n} are the levels of expenditure of the two foral autonomous —Basque Country and Navarre—, T^{bc} and T^{n} the corresponding tax revenue levels and $R^{c} = T^{c} + RR^{c}$. The other terms have already been defined in the main text.

Denoting the national equivalent of expenditure at the level of responsibilities of the Basque Country as EN^{bc}, that of Navarre as EN^{n} and the corresponding concept for the non foral community as EN^{nf}, where $NE^{bc} > NE^{n} > NE^{nf}$, we assume in order to identify the reference position that the normative expenditure assigned to each jurisdiction is distributed according to their relative population. Thus,

$$E^{bc} = \alpha_{bc} EN^{bc}; \quad E^{nc} = \alpha_{n} EN^{n} \quad \text{and} \quad E^{nf} = \alpha_{nf} EN^{nf}, \tag{A.2}$$

where $\alpha_{bc} + \alpha_{n} + \alpha_{nf} = 1$. We also assume that

$$E^{bc} < T^{bc}, \quad E^{n} < T^{n}, \quad E^{nf} > T^{nf} \quad \text{and} \quad E^{c} < R^{c} + D.$$

In terms of the normative budgets of the three jurisdictions, the model is

$$E^{bc} + C^{bc} = T^{bc}, \tag{A.3.1}$$

$$E^{n} + C^{n} = T^{n}, \tag{A.3.2}$$

$$E^{nf} = T^{nf} + S, \tag{A.3.3}$$

$$E^{c} + S = R^{c} + C^{cb} + C^{n} + D, \tag{A.3.4}$$

where C^{cb} and C^{n} are the two cupos paid by the Basque Country and Navarre to the central jurisdiction, and S the transfer from the central to the non foral jurisdiction. The solutions for the four unknowns are

$$C^{bc} = T^{bc} - E^{bc}, \tag{A.4.1}$$

$$C^{n} = T^{n} - E^{n}, \tag{A.4.2}$$

$$S = E^{nf} - T^{nf}, \tag{A.4.3}$$

$$D = E - R. \tag{A.4.4}$$

where $E = E^{bc} + E^{n} + E^{nf} + E^{c}$ and $R = T^{bc} + T^{n} + T^{nf} + R^{c}$.

The indirect way of measuring (A.4.1) and (A.4.2) are:

$$C^{f} = E^{cf} - R^{cf} - D^{f}, \quad (f = bc, n) \tag{A.5}$$

where

$$D^{f} = E^{tf} - R^{tf}, \quad (f = bc, n) \tag{A.6}$$

$E^{tf} = E^{f} + E^{cf}$ and $T^{tf} = T^{f} + T^{cf}$ for $(f = bc, n)$.

The equivalent of equation (20) of the main text is now

$$\left(T^{bc} - E^{bc}\right) + \left(T^{n} - E^{n}\right) - S = C^{bc} + C^{n} + \left(E^{cnf} - R^{cnf} - D^{nf}\right). \tag{A.7}$$

where $E^{cbc} + E^{cn} + E^{cnf} = E^{c}$, $T^{cbc} + T^{cn} + T^{cnf} = T^{c}$ and $D^{bc} + D^{n} + D^{nf} = D$.

And the definition of the cupos following the legal imputation procedure —the equivalents of equation (22) in the main text— are

$$C^{fL} = i_{f}\left(NE^{cfL} - NT^{cfL} - ND^{fL}\right). \quad (f = bc, n) \tag{A.8}$$

Distribution of expenditure and tax responsibilities

Now we distinguish four types of responsibilities, which measured by its national level are: *EA*, those expenditure responsibilities that because of their nature cannot be decentralized; *EB*, those responsibilities that can be decentralized and are assigned to both foral and non foral autonomous jurisdictions; *EC*, those responsibilities that can be decentralized and are only assigned to the two foral jurisdictions; and *ED*, those responsibilities that can be decentralized and are only assigned to the Basque Country. We thus add a new category to the list, *ED*, to account for the larger set of responsibilities that the Basque Country has over Navarre. Thus

$$E^{bc} = \alpha_{bc}\left(EB + EC + ED\right), \tag{A.9.1}$$

$$E^{n} = \alpha_{n}\left(EB + EC\right), \tag{A.9.2}$$

$$E^{nf} = \alpha_{nf} EB, \tag{A.9.3}$$

$$E^{c} = EA + \alpha_{nf} EC + \left(\alpha_{n} + \alpha_{nf}\right) ED. \tag{A.9.4}$$

It is easy to see that

$$E = E^{bc} + E^{n} + E^{nf} + E^{c} = EA + EB + EC + ED. \tag{A.10}$$

Also, the national equivalents of E^{bc} and E^{n} are $NE^{bc} = EB + EC + ED$ and $NE^{n} = EB + EC$, and the national equivalents of E^{cbc} and E^{cn} are $NE^{cbc} = EA$ and $NE^{cn} = EA + ED$.

The tax system is the same as the one described in the main text. The equivalent expressions for equations (25) of the main text are now

$$T^{bc} = \beta_{bc}\left(ST + CT + OT\right), \tag{A.11.1}$$

$$T^{n} = \beta_{n}\left(ST + CT + OT\right), \tag{A.11.2}$$

$$T^{nf} = \beta_{nf}\left(\gamma ST + OT\right), \tag{A.11.3}$$

$$R^{c} = \beta_{nf}\left[\left(1-\gamma\right)ST + CT\right] + NTT^{c} + RR^{c}. \tag{A.11.4}$$

where $\beta_{bc} + \beta_{n} + \beta_{nf} = 1$, and γ is the proportion of *ST* taxes that goes to the non foral jurisdiction.

Also,

$$R = T^{bc} + T^{n} + T^{nf} + T^{c} + RR^{c} = ST + CT + OT + NTT^{c} + RR^{c}. \tag{A.12}$$

Finally, the three alternative forms of representing the consolidated budget are:

$$E = R + D, \tag{A.13.1}$$

$$E^{bc} + E^{n} + E^{nf} + E^{c} = T^{bc} + T^{n} + T^{nf} + T^{c} + RR^{c} + D, \tag{A.13.2}$$

$$EA + EB + EC + ED = ST + CT + OT + NTT^{c} + RR^{c} + D. \tag{A.13.3}$$

Reference and legal cupos

The Basque Country reference cupo defined in (A.5) can be expressed as

$$C^{bc} = \alpha_{bc}EA - \beta_{bc}\left(NTT^{c} + RR^{c}\right) - \left(\alpha_{bc}E - \beta_{bc}R\right), \tag{A.14}$$

where *E* and *R* are defined respectively by (A.10) and (A.12). On the other hand, from (A.8) the corresponding legal cupo is

$$C^{bcL} = i_{bc}EA - i_{bc}\left(NTT^{cL} + RR^{cL}\right) - i_{bc}\left[\left(1+\pi\right)E - R\right], \tag{A.15}$$

where NTT^{cL} is the central government not transferred tax revenue given by the law, and RR^{cL} the corresponding non-tax revenue.

The correct and legal cupos for Navarre are

$$C^{n} = \alpha_{n}\left(EA + ED\right) - \beta_{n}\left(NTT^{c} + RR^{c}\right) - \left(\alpha_{n}E - \beta_{n}R\right), \tag{A.16}$$

and

$$C^{nL} = i_{n}\left[EA + \left(\alpha_{n} + \alpha_{nf}\right)ED\right] - i_{n}\left(NTT^{cL} + RR^{cL}\right) - i_{n}\left[\left(1+\pi\right)E - R\right]. \tag{A.17}$$

The not assumed expenditure effect is, for the Basque Country

$$\left(\alpha_{bc} - i_{bc}\right) EA, \tag{A.18}$$

and for Navarre

$$\left(\alpha_{n} - i_{n}\right) EA + \left[\alpha_{n} - i_{n}\left(\alpha_{n} + \alpha_{nf}\right)\right] ED. \tag{A.19}$$

The non-concerted revenue effect for the Basque Country is

$$-\left(\beta_{bc} - i_{bc}\right)\left(NTT^{c} + RR^{c}\right) + i_{bc}\left[\left(NTT^{cL} + RR^{cL}\right) - \left(NTT^{c} + RR^{c}\right)\right], \tag{A.20}$$

and for Navarre,

$$-\left(\beta_{n} - i_{n}\right)\left(NTT^{c} + RR^{c}\right) + i_{n}\left[\left(NTT^{cL} + RR^{cL}\right) - \left(NTT^{c} + RR^{c}\right)\right]. \tag{A.21}$$

Finally, the deficit effect for the Basque Country is

$$-\left(\alpha_{bc} - i_{bc}\right) E + \left(\beta_{bc} - i_{bc}\right) R + i_{bc} \pi E, \tag{A.22}$$

and for Navarre

$$-\left(\alpha_{n} - i_{n}\right) E + \left(\beta_{n} - i_{n}\right) R + i_{n} \pi E. \tag{A.23}$$

A.2. Data

Tax responsibilities

With reference to equations (A.11.1) to (A.11.4), we know from INE that relative income in the three autonomous jurisdictions are β_{bc}=0.0619, $\beta_{n} = 0.0168$ and $\beta_{nf} = 0.9213$.

The data provided by the Spanish State budget of 2007 (MINHAP, 2013a) allows us to estimate practically all the tax revenue elements of the model, and not only for the central government jurisdiction but also for the three decentralized jurisdictions. This is so because this source ─in particular, Table IV.2.1 of the Yellow Book─ gives information, by tax figures, not only about the tax revenue shared by the central government, but also about total tax revenue budgeted within the non-foral territory.

Total tax revenue budgeted for 2007 in central and non-foral jurisdictions for the three groups of shared taxes (Income Tax, VAT and Excises) is €138,880 million. Therefore

$$\beta_{nf} ST = €138,880 \text{ million.}$$

Also, the share of this total that remains with the central government is

$$\beta_{nf}\left(1 - \gamma\right) ST = €86,973 \text{ million.}$$

Form the assumptions of our model, these two pieces of information imply that the amount of shared taxes for the whole Spanish territory and the average proportion in which these taxes are shared between the central and the non-foral jurisdictions are[29]:

$$ST = €150,747 \text{ million} \quad \text{and} \quad \gamma = 0.37.$$

From the same source, we also know that

$$\beta_{nf} CT = €41,641 \text{ million.}$$

Therefore, the implied corporate tax revenue for the whole Spanish territory is

$$CT = €45,199 \text{ million.}$$

Finally, from MINHAP (2013b), we know that

$$\beta_{nf} OT = €29,481 \text{ million,}$$

or

$$OT = €32,000 \text{ million.}$$

Therefore

$$ST + CT + OT = €227,947 \text{ million.}$$

Then using equations (A.11.1), (A.11.2) and (A.11.3) we find, in €million, the tax revenue of the three autonomous jurisdictions:

$$T^{bc} = 14,106$$

$$T^{n} = 3,839$$

$$T^{nf} = 81,388$$

To find out the tax and non-tax revenue of the central government ─expression (A.11.4)─ we need to identify the values of NTT^c and RR^c. Not transferred central government tax revenue equals total central government tax revenue, T^c, which from MINHAP (2013a) is €137,151 million, minus central government tax revenue from tax figures shared with the foral and non-foral jurisdictions. That is,

$$NTT^c = T^c - \beta_{nf}\left[(1-\gamma)ST + CT\right],$$

or,

$$NTT^c = 137,151 - 128,614 = €8,537 \text{ million.}$$

To calculate the residual central government revenue, RR^c, we must first identify central government total revenue, R^c, which is equal to total revenue as figured in the central

[29] The equivalent, all Spanish territory, tax revenue figures in €million for Income Tax, VAT and Excises are, respectively, 67,244; 62,858; and 20,645.

government budget, €147,545 million, minus the sum of the two legal cupos, which is €3,046 million. Thus

$$R^c = 147,545 - \left(C^{bcL} + C^{nL}\right) = 147,545 - 3,046 = €144,500 \text{ million},$$

where the two cupos, C^{bcL} and C^{nL} are obtained, respectively, from BOE (2007b) and BOE (2007c). Then,

$$RR^c = R^c - T^c = 144,500 - 137,151 = €7,348 \text{ million}.$$

To summarize, the revenue side of the central government budget is

$$R^c + \left(C^{bcL} + C^{nL}\right) = \beta_{nf}\left[(1-\gamma)ST + CT\right] + NTT^c + RR^c + \left(C^{bcL} + C^{nL}\right),$$

or

$$R^c + \left(C^{bcL} + C^{nL}\right) = 128,614 + 8,537 + 7,348 + 3,046 = €147,545 \text{ million}.$$

As expressions (A.15) and (A.16) indicate, the definitions of the two legal cupos incorporate the concepts "central government not transferred taxes", NTT^c, and "other non-tax central government tax revenue", RR^c, but the values given by the law for these two concepts, particularly that for NTT^c, differ from the values estimated here. In particular,

$$NTT^{cL} = €3,943 \text{ million} \quad \text{and} \quad RR^{cL} = 7,589 \text{ million}.$$

Expenditure responsibilities

With reference to equations (A.9.1) to (A.9.4), we know from the regional data provided by INE (National Statistics Institute) that $\alpha_{bc} = 0.0474$, $\alpha_n = 0.0134$ and therefore $\alpha_{nf} = 0.9392$. From BOE (2007b) and BOE (2007c) we know that $i_{bc} = 0,0624$ and $i_n = 0,0160$.

Also, we know from MINHAP (2013a) that total expenditure in the Spanish State budget, $E^c + S = EA + \alpha_{nf} EC + \left(\alpha_n + \alpha_{nf}\right) ED + S$, is €188,417 million; and from BOE (2007b) that the value in the Spanish State budget of expenditure associated to the responsibilities of the Basque Country plus the transfer to the non-foral jurisdiction ─article 4.3.b of BOE (2007b)─, the so called "assumed" expenditure $\alpha_{nf} EC + \left(\alpha_n + \alpha_{nf}\right) ED + S$, is €102,665 million. Therefore, using (A.9.4) we conclude that the value of non-decentralized expenditure, "not assumed" expenditure, is $EA = €85,753$ million, $\left(= 188,417 - 102,665\right)$.

Regarding the value of *EB*, we know from MINHAP (2013b) that $S = €32,615$ million, and from our calculations above that $T^{nf} = €81,388$ million. Therefore, the total expenditure capacity normatively given to the non-foral jurisdiction is

$E^{nf} = €114,003$ million $(=81,388+32,615)$. Then, from equation (A.9.3) it follows that *EB* is equal to €121,381 million.

In equation (A.9.4), $\alpha_{nf} EC$ is the Spanish State budget expenditure associated to Navarre responsibilities. We know from the law that establishes the Navarre cupo, BOE (2007c), that the value of the assumed charges of this community plus the transfer to the non-foral jurisdiction —article 54.2.b of BOE (2007c)— is €75,723 million[30]. Therefore, $\alpha_{nf} EC + S = 75,723$ million and $EC = €45,899$ million.

Finally, and using again (A.9.4), from the above it must be the case that $(\alpha_n + \alpha_{nf}) ED$ is €26,942 million, $(=102,665-75,723)$, the difference between the Spanish State budget expenditure associated to the Basque Country and that associated to Navarre. Therefore, $ED = €28,282$ million.

We thus have that the 2007 values of the four types of expenditure responsibilities identified in our model (expressed in €million) are

$$EA = 85,753$$
$$EB = 121,381$$
$$EC = 45,899$$
$$ED = 28,282$$

and, using (A.9.1) to (A.9.4), the normative levels of expenditure of the four jurisdictions are

$$E^{bc} = 9,267$$
$$E^{n} = 2,242$$
$$E^{nf} = 114,003$$
$$E^{c} = 155,803$$

Reference cupos, C^{cb} and C^{n}***, transfer, S, and deficit, D***

The way they have been calculated, the normative values of expenditure and tax revenue given above define a position of the system in which foral communities do not enjoy any economic privilege over the non foral communities. Thus the reference cupos, given by expressions (A.14) and (A.16)[31], and the transfer to non-foral communities, given by expression (A.4.3)), are (in €million):

[30] This figure refers to 2005 and has been updated to 2007 using the State expenditure budget in order to make it temporally consistent with the data of the Basque Country cupo.

[31] The same results would be obtained using formulas (A.4.1) and (A.4.2) for the cupos.

$$C^{bc} = 4,839$$
$$C^{n} = 1,597$$
$$S = 32,615$$

Finally, the deficit generated by this reference position can be found from expression (A.4.4) as the difference between consolidated expenditure, *E*, and consolidated revenue, *R*. Consolidated expenditure is €281,314 million and consolidated revenue €243,832 million. Therefore, the deficit of the whole regional system (which normatively coincides with the deficit of the central jurisdiction), expressed in €million, is

$$D = 37,482.$$

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