

Do you know to whom you pay your taxes? The case of decentralised Spain

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Funding information

This research was supported by the Government of Aragón (Project S23_20R, Grupo de Investigación de Economía Pública).

Abstract

Surveys show that most citizens are unable to correctly identify the taxes received or the services provided by the different levels of government. This shortcoming represents an obstacle to democratic accountability and for the efficiency gains that the theory of fiscal federalism attributes to fiscal decentralisation be effective. Exploiting the 2015 wave of the Spanish Institute for Fiscal Studies' Fiscal Barometer, this paper empirically determines the profile of citizens who are best able to identify the allocation of taxes among the central, regional and local levels of government. The estimates suggest that these citizens are those who are able to identify the government that provides the services financed by those taxes, who correctly identify other taxes received by the same government, who reside in a foral region, and who enjoy a high level of education.

KEYWORDS

accountability, decentralisation, Spain, tax revenues, visibility

1 | INTRODUCTION

Over the last four decades, Spain has undergone a major process of decentralisation of expenditure and (with some delay) taxation responsibilities to the autonomous communities (hereinafter, ACs), while the competences of the municipalities have remained largely unchanged. At present, ACs participate in the yield of most of the taxes of the

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Spanish tax system, and they can also exercise some powers in the regulation and management of these taxes. Municipalities are also assigned a smaller set of taxes, with wide-ranging collection, management and regulatory powers.

However, and as in other decentralised countries, most citizens are still not able to correctly identify the taxes received or the services provided by the different levels of government. This shortcoming makes it difficult for citizens to know with some degree of precision the costs and benefits of the services they receive from the respective public administrations and, accordingly, represents an obstacle to democratic accountability and for the efficiency gains that the theory of fiscal federalism attributes to fiscal decentralisation be effective (Lockwood, 2009; Oates, 1972, 2005). Hence the interest in identifying the factors that explain the greater or lesser ability of citizens to correctly attribute responsibility for various public expenditures and tax revenues.

While the literature has extensively dealt with the determinants of the visibility of spending powers across many different decentralised settings (including Spain), empirical research on the tax side is almost non-existent. In the Spanish case, other than from a descriptive point of view (Herrero Alcalde et al., 2015; León, 2015), to the best of our knowledge the only paper which tried to econometrically estimate Spaniards' visibility in the allocation of the Personal Income Tax and the Value Added Tax between central and regional levels has been López-Laborda and Rodrigo (2014).

This paper exploits the special questionnaire pertaining to the 2015 wave of the Spanish Institute for Fiscal Studies' (IEF) Fiscal Barometer, which allows us to extend the research on tax visibility in several directions. First, we contrast for the first time citizens' tax visibility taking into account the three levels of government in a decentralised country, including the barely explored local level. Second, we conduct an econometric analysis for seven of the main taxes that make up the Spanish tax system: Corporate Income Tax (IS), Personal Income Tax (IRPF), Value Added Tax (IVA), Inheritance and Gift Tax (ISD), Capital Transfer Tax, Taxes on the Raising of Capital, and Stamp Duties (ITPAJD), Property Tax (IBI) and Vehicles Tax (IVTM). And third, as stated above, these exercises are carried out for the year 2015, when the first survey on Spanish tax visibility on the whole is conducted which, as we shall see, correctly poses the options to respondents.

According to the results obtained, there are a few elements that characterise citizens who best perceive the allocation of taxes in Spain: being informed of the allocation of functions between levels of government, being aware of other taxes levied by the same level of government, residing in a foral region (Navarre and the Basque Country) and enjoying a higher level of education. These features allow us to provide a series of recommendations to improve visibility in the assignment of taxes between levels of government in Spain.

The paper is organised as follows. After this introduction, the second Section provides the conceptual framework and literature review. The third Section describes the Spanish institutional background. The fourth Section describes the database. The fifth and sixth Sections present, successively, the specifications and estimates performed. The last Section concludes.

2 | CONCEPTUAL FRAMEWORK AND LITERATURE REVIEW

There are two main strands of research dealing with the visibility of the distribution of responsibilities and policy outcomes in decentralised countries. The first is related to the topic of economic voting and studies how voters' attribution of responsibilities to different levels of government affects the direction of their vote (Powell & Whitten, 1993; Rudolph, 2003a, 2003b; Cutler, 2004, 2008; Anderson, 2006; Arceneaux & Stein, 2006; Tilley & Hobolt, 2011; de Vries & Giger, 2013; Anderson et al., 2017; on the Spanish case, see Lago Peñas & Lago Peñas, 2011; León & Orriols, 2016; León & Jurado, 2019). With respect to this line of research, it is worth noting that tax visibility has been only recently (and seldom) used as an explanatory variable of (and generally found negatively related to) electoral support (Anderson et al., 2017; Cutler, 2017; Johns, 2011).

A second strand of research, in which this paper is included, aims to identify the determinants of visibility. The literature has dealt extensively with the determinants of the visibility of allocation of economic and spending responsibilities among government levels, but research on the tax side is almost non-existent. On the conceptual side, the

starting point on visibility stems from the fact that citizens form their preferences and beliefs according to the information they are exposed to (Cutler, 2010; Malhotra, 2008), including willingness not to know (Ginzburg & Guerra, 2019). In this vein, and precisely emphasising the role of information, the literature has identified individual and institutional/contextual features as the two dimensions shaping government visibility in citizens (Arceneaux, 2006; Cordero & Lago Peñas, 2016; Hobolt & Tilley, 2014; Rudolph, 2003b).

At the individual-level, citizens' knowledge about the distribution of responsibilities depends on socio-demographic characteristics, as well as on political values and beliefs. With respect to the former, age is positively associated with obtaining information on what level of government carries out each policy, although the sign may change for older ages (Herrero Alcalde et al., 2018; León, 2010, 2011; López-Laborda & Rodrigo, 2015). The same applies for more educated people, as education has been proved as a proxy for greater political sophistication (Cutler, 2008; León, 2010, 2011, 2012; León & Ferrín, 2007; López-Laborda & Rodrigo, 2015). With regard to sex, although there is some evidence about greater political knowledge of men with respect to women (Fraile, 2014; Herrero Alcalde et al., 2018), greater or lesser awareness depends also on other circumstances, such as habitat size (López-Laborda & Rodrigo, 2012). Work status is also positively correlated with visibility, given that it comprises one of the most important sources of individuals' information. Thus, being an employee (León, 2010; León & Ferrín, 2007; Rudolph, 2003a) or working for the public sector (López-Laborda & Rodrigo, 2015) favours the accurate identification of responsibilities. Finally, if citizens consume certain public goods and services and are therefore more related to public sector activity, they are also more likely to better identify the correct level of government responsible for the provision of those goods or services (Herrero Alcalde et al., 2018; León, 2015; López-Laborda & Rodrigo, 2014).

With regard to political values and beliefs, literature has provided evidence about the pervasive effect on visibility stemming from group-serving biases, such as partisan (and voting) loyalties and identity-related issues: Rudolph (2003a and 2003b), Maestas et al. (2008), Malhotra (2008), Malhotra and Kuo (2008) and Brown (2010) for USA; Tilley and Hobolt (2011), Hobolt et al. (2014) and León and Orriols (2019) for UK and Ireland; and Wilson and Hobolt (2015) and León et al. (2018) for the European Union. In the Spanish context, right-wing ideology hinders the correct attribution of responsibilities (León, 2011, 2012; León & Ferrín, 2007; López-Laborda & Rodrigo, 2015), as well as the preference for a centralised state (Lago Peñas & Lago Peñas, 2013; León, 2010, 2011, 2012; López-Laborda & Rodrigo, 2015).

In addition, political sophistication seems to favour the accurate attribution of responsibilities. As defined by Gomez and Wilson (2007, p. 639), political sophistication “packs together related, if distinguishable, properties including a tendency to pay close attention to politics, to have ready at hand banks of information about it, to understand multiple arguments for and against particular issue positions, and to recognize interrelationships among those arguments” (see also de Vries & Giger, 2013). In this vein, but with ambiguous empirical results for Canada, prominence, or “how much citizens care about the policy outcomes in question (...), creates an incentive to make responsibility attributions” (Cutler, 2017, p. 1042). Literature confirming the political sophistication argument in Spain is extensive. For example, and contrary to what was found in Cutler (2017), people with favourable views about the public sector or certain policies also tend to have a greater degree of visibility (León & Ferrín, 2007; López-Laborda & Rodrigo, 2014).

As far as institutional/contextual factors are concerned, and drawing on the Canadian experience, Cutler (2013, 2017) strongly warns that the conditions for a proper identification of the governments responsible for each policy can only be expected “under a ‘watertight compartments’ version of federalism where only one government is involved in a given policy area” (Cutler, 2017, p. 1055; see also Anderson, 2000), but not “in a context with highly evolved multi-level government structures—that is, complex intergovernmental relationships that vary across policy domains” (Cutler, 2013, p. 26; León et al., 2018, regarding EU countries). It should be added that there are also important institutional differences between advanced federations that may hinder the attribution of responsibilities by citizens (León & Orriols, 2016).

Spain provides a good example of these caveats. In principle, clarity in the distribution of competences may facilitate their visibility—for example, if the competences are exclusive to a single level of government (Lago Peñas & Lago Peñas, 2013) or citizens reside in a foral region (Herrero Alcalde et al., 2018; León, 2015). But this greater visibility

may be contingent (with an uncertain sign) on other factors, such as residence in ACs that first achieved a higher level of competences (Lago Peñas & Lago Peñas, 2011; Lago Peñas & Lago Peñas, 2013) or the ideological coincidence between the national and regional governments (León, 2011; León & Orriols, 2016). The existence of coalitions in government can also hamper citizens' visibility (Lago Peñas & Lago Peñas, 2011). Finally, although Cutler (2008), for Canada, finds that judgements about responsibility are unstable over time, in Spain, there is agreement that visibility improves over time (Cordero & Lago Peñas, 2016; León, 2015), although only for regions that first achieved a higher level of responsibilities.

As Herrero Alcalde et al. (2018) highlight, media are a contextual factor of crucial importance in the process that allows citizens to obtain the information they need to identify the government responsible for each policy. The positive impact of mass media on visibility has been widely contrasted in the literature (Cutler, 2008, 2017; Wilson & Hobolt, 2015). The same positive effect should be expected for people living in urban areas, since it is observed worldwide that there is a concentration of human capital in cities, a conjecture that has gained empirical support (Herrero Alcalde et al., 2018).

The only paper that, as far as we know, econometrically explores Spaniards' tax revenue visibility, pointed out that visibility is higher for those who correctly attribute expenditure-based powers, are more educated, and live either in large cities, in foral regions or in regions which first achieved a higher degree of devolution, while non-taxpayers and citizens living in self-financing regions (namely, those ACs not financially dependent on grants from the central or other regional governments) show less government visibility (López-Laborda & Rodrigo, 2014).

3 | INSTITUTIONAL BACKGROUND: THE TAX DEVOLUTION PROCESS IN SPAIN

Soon after democratic restoration in 1977, Spain went through a devolution process that has led the country to be nowadays one of the most decentralised states worldwide (OECD, 2022). At the regional level, two groups of ACs must be distinguished: ACs under the foral or charter regime, which are the Basque Country and Navarre, and ACs under the common regime, all others. As a whole, the ACs under the common regime obtain their revenues from two basic sources: the so-called “ceded taxes” (*impuestos cedidos*) and the grants from the central level (which, to some extent, have an equalisation purpose). At present, ceded taxes (and other minor own revenues, like fees, charges and so on) amount to 75% of non-financial revenues for all the ACs under the common regime; grants represent the remaining 25%. Ceded taxes are established and regulated by the central level, though the proceeds are assigned in whole or in part to the ACs. Today, there are only two relevant taxes that have not been ceded to the ACs: the IS and social security contributions, over which the central government continues to exert all powers.

The four regional taxes considered in our research have a very different regime of decentralisation. In IRPF and IVA, the ACs have a share of 50% of the collection but their management is the responsibility of the central government. ACs have discretion over the tax rate and some tax credits in the IRPF, but they cannot legislate on IVA. In the ITPAJD and the ISD, the ACs are entitled to 100% of the collection, manage both taxes and have wide discretion over the tax rate, allowances and tax credits.

The foral communities obtain almost 100% of their revenues from the so-called “agreed taxes” (*tributos convenidos* in Navarre and *tributos concertados* in the Basque Country). Foral ACs enjoy more powers over these taxes than the common regime ACs over the corresponding ceded taxes. The only tax that remains outside of the foral regime are social security contributions. In all the taxes that constitute the object of our investigation foral regions receive 100% of the collection, in addition to managing and regulating them (with the exception of IVA). It is also worth noting that in the Basque Country tax powers do not correspond to the Autonomous Community but to the three provinces or “historical territories” that make it up. The foral communities contribute to financing the expenditure responsibilities of the central level through a grant, which is called quota (*cupo*) in the Basque Country and contribution (*aportación*) in Navarre.

As said, one crucial feature depicting the local financing system has been its stability over the last four decades. The revenue of Spanish municipalities also comes from taxes and grants. Currently, the former represents about 60% of the non-financial revenue of all municipalities; transfers form the other 40%. In the two taxes that we deal with in our application (IBI and IVTM), municipalities receive the entire collection, manage the taxes and can set the tax rates and some allowances and tax credits, within certain limits.

4 | DATABASE

The database consists of the information provided by the 2015 wave of the Fiscal Barometer, a yearly survey carried out by the Spanish Institute for Fiscal Studies. The survey gathers citizens' opinions and attitudes on various topics related to public sector activity. The Barometer is a nationally and regionally representative sample of 3000 individuals (Área de Sociología Tributaria, 2016).

Though waves prior to 2015 have been used to test the determinants of tax visibility (López-Laborda & Rodrigo, 2014), the 2015 questionnaire is more suitable for the purpose of this paper. First, because the 2005 and 2007 waves completely forget about local taxes and taxes whose revenues exclusively go to regional Treasuries. Second, because in the case of residents in the Basque Country, just the 2015 wave offers the possibility of a purely correct answer, since it is the only questionnaire that includes Provinces as a choice. Third, because the 2010 wave, regarding the IRPF and IVA, does not offer the purely correct answer, which would be that tax revenues coming from both taxes are benefiting more than one level of government, including local entities. And fourth, because the question of the attribution of tax revenues in every wave but the 2015 one goes as follows: "What level of government do you pay the *T* tax?". The interpretation of such a question is not straightforward, since both the central Tax Agency and each foral tax agency collect the IRPF and IVA, whose revenues are shared between different levels of government. In the 2015 wave, the question on the attribution of tax revenues is far more accurate and as follows: "What level of government is the recipient of *T* tax revenues?"

Figure 1 shows the shortcomings in the attribution of tax collection to each level of government in Spain in 2015, a persistent pattern over time (Herrero Alcalde et al., 2015; López-Laborda & Rodrigo, 2014), which seems to

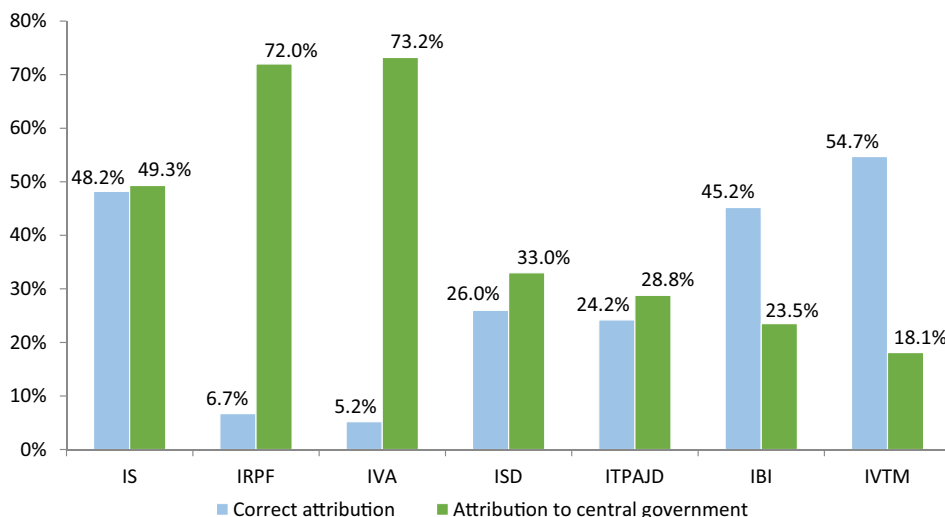


FIGURE 1 Percentage of accurate attribution of taxes to the different levels of government and to the Central Government, 2015. *Source:* Authors' elaboration with data from the Spanish Institute for Fiscal Studies' Fiscal Barometer. [Colour figure can be viewed at wileyonlinelibrary.com]

affect Spaniards homogeneously across the whole country (León, 2015). More than 70% of residents still believe that IRPF and IVA are received in full by the central level. The explanation may lie, at least in part, in the fact that, as explained above, these taxes are managed by the central Tax Agency (with the exception of the foral communities), which then remits to each government its share of the collection. The visibility of ITPAJD and ISD is much higher, although it is less than 30%, probably due to the fact that the ACs regulate and manage these taxes and keep all of their collection.

Although the percentages of correct attribution of the IBI and IVTM exclusively to local corporations are even higher (45% and 55%, respectively), these figures are still low, given that these taxes have been part of municipalities' budgets for decades and that municipal powers to regulate and manage them seem much clearer and more visible than in regional taxes, and also considering the link between these taxes (especially the IBI) and the services provided by municipalities.

There is also a relatively high percentage of citizens (48%) who correctly attribute the collection of IS. However, in view of what happens with the other taxes, we are left wondering how much of this percentage is due to citizens' genuine knowledge and how much is due to the fact that, as we have seen, many people continue inertially thinking that all taxes belong to the central level.

5 | SPECIFICATIONS

We propose four hypotheses in which we incorporate a set of individual and institutional/contextual factors whose influence on the visibility of the distribution of expenditure and tax responsibilities has been confirmed in the literature (Section 2), but also other variables directly related to the specific features of the assignment of tax responsibilities in Spain and their exercise by the different governments (Section 3). Accordingly, the probability of correctly identifying which level of government is the recipient of any given tax should be higher for:

Hypothesis H1. *Citizens that use public services or receive public benefits provided by this level of government, as well as those citizens with a greater degree of visibility on the expenditure side regarding that same level of government.*

Hypothesis H2. *Citizens that accurately identify other taxes whose revenues finance the same level of government.*

Hypothesis H3. *Citizens living in subcentral jurisdictions where governments exert their taxation powers, either to modify the tax rate or to pass tax credits or allowances.*

Hypothesis H4. *Citizens with favourable views about public intervention.*

In order to test the hypotheses above, and given the hierarchical structure of the data (with observations nested at various levels), we construct the following multilevel specification for each of the seven taxes under study:

$${}^i T \text{ TAXVISIB}_{ij} = \mathbf{X}_{ij} \beta + \mathbf{Z}_{ij} \gamma + \mu_{ij} + \eta_j, \quad (1)$$

where the sub-index i denotes the individual and j their region of residence; ${}^i T \text{ TAXVISIB}_{ij}$ is the endogenous variable; \mathbf{X}_{ij} is a vector of variables of interest stemming from the hypotheses defined above; \mathbf{Z}_{ij} is a vector of control variables, μ_{ij} (with mean 0 and variance σ_{μ}^2) is an error term for the individual level (level 1), and η_j (with mean 0 and variance σ_{η}^2) is an error term for the regional level (level 2). In the literature, this type of specification is known as a random intercept model.

The endogenous variables for each of the estimated specifications are the following ones:

ISVISIB: a dummy variable taking a value of 1 if the individual correctly attributes Corporate Tax revenues (i) to the central government, if the subject lives in regions under the common regime, (ii) to the region, if the subject lives in Navarre, or (iii) to Provincial Governments, if the subject lives in the Basque Country; and 0 otherwise.

IRPFVISIB/IVAVISIB: a dummy taking a value of 1 if the individual correctly attributes these tax revenues (i) to more than one level of government, if the subject lives in regions under the common regime, (ii) to the region, if the subject lives in Navarre, or (iii) to Provincial Governments, if the subject lives in the Basque Country; and 0 otherwise.

ISDVISIB/ITPAJDVISIB: a dummy taking a value of 1 if the citizen correctly attributes these tax revenues (i) to ACs, if the subject lives in any region but the Basque Country, or (ii) to Provincial Governments, if the subject lives in the Basque Country; and 0 otherwise.

IBIVISIB/IVTMVISIB: a dummy taking a value of 1 if the individual correctly attributes these tax revenues to the local level, and 0 otherwise.

The vector of independent variables consists of five groups of variables. The first four are correlatively aimed at testing the four hypotheses defined above. The last group makes up the vector of controls that are common to all specifications, namely socio-demographic variables which, according to the literature reviewed, could also partly explain citizens' greater or lesser tax visibility. Then, we detail and justify the variables included in each of the five aforementioned groups. It should be noted that, although we attempt to test the same hypotheses with the seven specifications indicated above, the variables used for this cannot always be the same, given the differences that exist in the allocation of taxes (Section 3). Table A1 in Annex explains how each variable has been constructed. Table A2 shows the descriptive statistics for all the variables considered.

5.1 | Variables related to public services and benefits visibility

If citizens correctly identify the governments that provide public services, it should be more likely that they will also correctly identify the governments that collect the taxes that finance those services. López-Laborda and Rodrigo (2014) have found that this hypothesis works in both directions: tax visibility also favours expenditure visibility. So, we construct three dummies, representative of the visibility of central unemployment and pension services (*CENTRALEXPVISIB*), regional education and health services (*REGEXPVISIB*) and local public lighting and garbage collection services (*LOCALEXPVISIB*). We attribute a positive expected sign to the coefficients of these variables.

In the same way, if citizens use public services or receive public benefits, it is more likely that they will correctly identify the administration that provides and, consequently, finances them (Herrero Alcalde et al., 2018; León, 2015; López-Laborda & Rodrigo, 2014). The following discrete variables reflect this link, again with a positive expected sign for their coefficients: *UNEMPLOYUSER*, *EDUCATIONUSER*, *HEALTHUSER*.

There is still another group of factors which we can associate with a greater expenditure and tax visibility. First, an increase in the disclosing of public information (*TRANSPARENCY*) may be associated to a greater level of visibility (López-Laborda & Rodrigo, 2014). Second, regional TV channels devote a greater attention to regional and local issues, namely about subcentral government actions, thus, indirectly teaching about the distribution of responsibilities between levels of government. Therefore, citizens living in regions where regional public TV channels do not exist (*NOREGIONALTV*) may have a greater lack of visibility (Cutler, 2008; Herrero Alcalde et al., 2018; López-Laborda & Rodrigo, 2015; Wilson & Hobolt, 2015). Third, citizens living in regions that experienced a high level of devolution earlier than the other regions also showed an earlier preference for decentralisation. Moreover, these regions exert powers on health and education well before the rest of ACs. Therefore, it can be expected that citizens living in these regions (*HIGHLEVEL*) show a higher level of visibility (Lago Peñas & Lago Peñas, 2011; Lago Peñas & Lago Peñas, 2013; León, 2011; López-Laborda & Rodrigo, 2014, 2015). And fourth, an absolute majority regional government (*MAJORITY*) can favour a more crystal-clear exercise of regional competences, so citizens may relatively better perceive the distribution of responsibilities between levels of government (Lago Peñas & Lago Peñas, 2011).

However, it can also be argued that a government with such a majority may have more room for manoeuvre to obscure, if doing so suits it, the allocation of powers among levels of government. Consequently, we cannot assign an a priori sign to the coefficient of this variable.

5.2 | Variables related to other taxes visibility

Citizens who are able to attribute revenues stemming from one tax to a concrete level of government may be better able to attribute to that government revenues from other taxes that are also assigned to it. This hypothesis has so far not been tested in the literature. Since, as seen in Section 4, a large part of Spanish people think that all taxes are central (Figure 1), it is only worth testing this hypothesis for regional and local taxes. So, we construct two variables representing whether a citizen adequately identifies regional and local taxes: *REGTAXVISIB*, *LOCALTAXVISIB*. We assign a positive sign to their estimated coefficients.

Moreover, non-taxpayers do not relate themselves to taxation issues, namely to any Tax Administration, so identifying the recipient of tax revenues should be relatively more difficult for them. This is reflected in the variable *NOTAXPAYER*, to whose coefficient we assign a negative expected sign (López-Laborda & Rodrigo, 2014). In contrast, it can be conjectured that people living in the only four rich self-financing ACs are more aware of the allocation of taxes among government levels than residents in other regions. So, we construct the variable *SELFFINANCING*, with a positive expected sign (López-Laborda & Rodrigo, 2014).

In addition to the previous variables, we also include in this group the previously defined variables *TRANSPARENCY*, *IBIVISIB* and *IVTMVISIB*, with the expected signs already provided.

5.3 | Variables related to the exercise of taxation power

So far, this hypothesis has not been considered in the literature either. We do not test this hypothesis for local governments, as they have historically enjoyed powers to regulate local taxes and all municipalities exercise them. On the one hand, we construct the variables *NOINHERITAX* and *NOGIFTTAX*, which reflect whether the individual lives in an AC where no ISD is collected for inheritances or gifts to close relatives, respectively. We expect this action by the regional government to increase the visibility of the regional nature of the ISD. On the other hand, we construct the variables *REGIRPFRATE* and *REGITPAJDRATE*, which represent the top marginal tax rate applied by ACs in IRPF and ITPAJD, respectively. We expect that a higher tax rate will be associated with a higher visibility of the government responsible of the respective tax.

In addition, as we have seen in Section 3, foral regions have greater taxation powers than common regime ACs. Therefore, it may be expected that visibility in foral regions (*FORAL*) may be also higher (Herrero Alcalde et al., 2018; León, 2015; León & Orriols, 2016; López-Laborda & Rodrigo, 2014, 2015).

Finally, it may be well possible that taxes that represent a larger share of the receiving administration's budget are more visible to citizens. We contrast this relationship for the four regional taxes with variables *IRPFWEIGHT*, *IVAWEIGHT*, *ISDWEIGHT* and *ITPAJDWEIGHT*. It does not make sense to do the same for corporate tax because of its national character; it would only present a variation in the foral regions. We do not have the required itemised information to be able to make the same contrast for local taxes.

5.4 | Variables related to preference for public intervention

We propose the hypothesis that citizens with a positive preference for public intervention show a higher probability of knowing relatively better which level of government gets each tax's revenues. We do not believe this hypothesis

poses an endogeneity problem. It is true that citizens who are more aware of the distribution of powers are also more likely to be able to evaluate the performance of each government, but this does not necessarily mean that they will have a preference for public intervention, the opposite may be true. However, it is possible that a greater preference for public intervention translates into a greater interest in knowing the competences of each government, as some empirical research has confirmed (León & Ferrín, 2007; López-Laborda & Rodrigo, 2014).

We try to test this hypothesis with the following variables. *PUBLICSECTOR*, captures whether citizens think that the public sector performs a necessary social function. *REDISTRIBUTION* represents whether citizens think that one of the main objectives of public intervention is the reduction of inequality. We attribute a positive expected sign to the coefficients of these two variables. *POPULARPARTY* captures if citizens live in a region governed by the Popular Party, PP. Presumably, the representatives of the Popular Party are elected in territories with a lower taste for public intervention. Hence, we hypothesize that this fact could be associated with a lower knowledge of the division of taxation (and expenditure) powers across levels of government (Lago Peñas & Lago Peñas, 2013; León, 2010, 2011, 2012; León & Ferrín, 2007; López-Laborda & Rodrigo, 2015).

5.5 | Individual socio-demographic variables

The vector of control variables, common to all specifications, consists of a set of socio-demographic variables, common in the literature (as detailed in Section 2), that try to collect all the social and individual heterogeneity reported by the 2015 wave of the Fiscal Barometer: the age of the individual (*AGE*, *AGE*²), sex (*FEMALE*), civil status (*COUPLE*), origin (*INMIGRANT*), residence (*BIGCITY*, *RURAL*), education (*SECEDUCATION*, *TERTEDUCATION*, *UNIVERSITY*), and work status (*BUSINESS*, *SALARIED*, *UNEMPLOYED*, *RETIRED*).

6 | ESTIMATES AND RESULTS

We have successively estimated the seven specifications summarised in Equation (1) both considering and disregarding the hierarchical structure of the data. In order to determine which of the two estimates has a higher explanatory capacity, a conventional LR test is performed to confirm that, in all cases, the explanatory capacity of the multilevel models is greater than that of models that do not consider the hierarchical structure of observations. Consequently, Table 1 shows only the results obtained in the estimates of the multilevel models. This table also includes, for each estimated model, the value of ρ , the intraclass correlation coefficient, which indicates the percentage of the unexplained total variability of each endogenous variable that is attributable to the heterogeneity existing between ACs. In all estimates, the procedure we have followed is the so-called *backward stepwise regression*, which gradually eliminates variables until getting a reduced model which best explains the data.

In what follows, we carry out a joint analysis of the results reflected in Table 1. With the exceptions that we will indicate in due course, all the coefficients of the variables have the sign that we have attributed to them in the previous Section.

In view of the estimates, it can be argued that there is some empirical evidence to support the fulfilment of the first two hypotheses we have put forward. First (with the exception of the estimates for IRPF and IVA), if citizens know which level of government provides certain services, it is more likely that they will also know the taxes received by that same level of government (Hypothesis H1). However, there is strikingly no evidence that being a user of a service increases the visibility of taxes: only the coefficient of the variable *UNEMPLOYUSER* in the estimate referring to the IS is significant, but, surprisingly, with a negative sign, contrary to the expected one. The increase in the transparency of regional governments raises the probability of correctly identifying the allocation of IRPF and IVA between levels of government. Other variables potentially related to a greater regional identity and greater

TABLE 1 Results of the estimates

Dependent variable	IS VISIB	IRPF VISIB	IVA VISIB	ISD VISIB	ITPAJD VISIB	IBI VISIB	IVTM VISIB
Visibility of public services and benefits (Hypothesis H1)							
CENTRALEXPVISIB	1.17*** (0.15)						
REGIONALEXPVISIB				0.41*** (0.07)	0.38*** (0.07)		
LOCALEXPVISIB						1.41*** (0.36)	1.02*** (0.08)
UNEMPLOYUSER	-0.28** (0.11)						
EDUCATIONUSER							
HEALTHUSER		1.64** (0.75)	1.22** (0.55)				
TRANSPARENCY							
NOREGIONALTV							
HIGHLEVEL							0.33** (0.15)
MAJORITY	0.85*** (0.28)					-1.21*** (0.15)	
Tax visibility (Hypothesis H2)							
REGTAXVISIB		1.70*** (0.17)	1.67*** (0.19)	1.65*** (0.06)	1.71*** (0.06)		
IBIVISIB							1.17*** (0.05)
IVTMVISIB						2.00*** (0.09)	
LOCALTAXVISIB							
NOTAXPAYER							-0.32*** (0.06)
SELFFINANCING							
Exercise of taxation powers (Hypothesis H3)							
REGIRPFRATE							
REGITPAJD RATE							
NOINHERITTAX							
NOGIFTTAX							
IRPFWEIGHT (1)/(2)							
IVAWWEIGHT (1)/(2)							
ISDWEIGHT (1)/(2)							
ITPAJDWEIGHT (1)/(2)							
FORAL	-1.28*** (0.26)	2.77*** (1.12)	2.24*** (0.55)				

(Continues)

TABLE 1 (Continued)

Dependent variable	IS VISIB	IRPF VISIB	IVA VISIB	ISD VISIB	ITPAID VISIB	IBI VISIB	IVTM VISIB
Preference for public intervention (Hypothesis H4)							
PUBLICSECTOR	0.22*** (0.08)			0.18** (0.08)		0.29** (0.12)	
REDISTRIBUTION	-0.39* (0.22)						
POPULARPARTY							
Sociodemographic characteristics							
AGE	0.07*** (0.02)				0.05*** (0.01)		
AGE ²	-0.0008*** (0.0002)				-0.0005*** (0.0001)		
FEMALE							
COUPLE							
INMIGRANT							
BIGCITY					-1.06*** (0.34)	-1.39*** (0.31)	
RURAL						0.52*** (0.17)	
TERTEUCATION			0.40** (0.19)	0.30*** (0.11)		0.40*** (0.15)	
SECEUCATION				0.37*** (0.10)			
RETIRED							
UNIVERSITY							-0.68*** (0.17)
SALARIED							
UNEMPLOYED							
CONSTANT	-2.01*** (0.49)	-6.11*** (0.78)	-5.12*** (0.47)	-2.15*** (0.27)	-2.70*** (0.33)	-3.05*** (0.46)	-1.26*** (0.14)
Observations	2.977	2.977	2.977	2.977	2.977	2.977	2.977
LR χ^2	1010.65	141.56	101.76	914.53	907.58	986.38	852.51
Prob > χ^2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Log pseudolikelihood	-1940.3652	-642.7981	-547.61272	-1213.046	-1138.1386	-1621.7532	-1609.4064
Coefficient ρ	0.0142	0.1730	0.0842	0.0789	0.0473	0.0558	0.0513
LR test vs. unilevel (probit/logit) regression	16.57 (0.00)	31.14 (0.00)	7.94 (0.00)	35.68 (0.00)	8.95 (0.00)	50.93 (0.00)	46.23 (0.00)

Note: BUSINESS has not been included in the estimates because multicollinearity problems related to the use of this variable. Standard errors are shown in parentheses. ***Significant at 1%, **significant at 5%, *significant at 10%.

Source: Own elaboration.

information gathering, such as *NOREGIONALTV* and *HIGHLEVEL*, have not presented significant coefficients (except for the second variable, in the estimate of visibility of the *IVTM*).

Second, the probability of correctly identifying the government that receives a tax receipt also increases if individuals correctly identify other taxes that finance that same level of government (Hypothesis *H2*). Moreover, in the estimates of the visibility of *IVTM*, visibility decreases if the citizen is not a tax filer (*NOTAXPAYER*). However, the coefficients of the variable *SELFFINANCING*, which reflects whether an AC is financed from its own revenues without the need to receive transfers from any other government, have not proved to be significant. This result could be interpreted in the sense that what is relevant is not so much the volume of taxes received as their quality, that is, the powers that can be exercised over those taxes. However, in the light of our estimates, neither does the exercise of regulatory powers over taxes, nor their relative weight, appear to contribute to increasing their visibility, contrary to the hypothesis we have put forward above (Hypothesis *H3*). Only the coefficients of the *FORAL* variable are significant in some models. It is worth looking more closely at the results related to this last variable.

As Table 1 shows, if the citizen resides in a foral community, the probability of correctly identifying the allocation of *IRPF* and *IVA* increases. However, and curiously, living in a foral community reduces the probability of properly identifying that the *IS* is a foral revenue. In the case of the Basque Country, this result is due to the fact that most citizens in this region (understandably) attribute this tax to the AC, rather than to the provincial governments, which, as we know, are the real beneficiaries of all taxation powers. Residents of Navarre, like those in the other ACs, mostly attribute the *IS* to the central level. As regards the other two regional taxes, the *ISD* and the *ITPAJD*, the coefficients of the *FORAL* variable are not significant, probably because common regime ACs can exercise in these taxes practically the same competences as the foral regime ACs, in terms of revenue, management and regulation.

Neither do the estimates support broadly support the view that the preference for public intervention improves the visibility of the allocation of taxes (Hypothesis *H4*), except, distinctly, in the case of the *IS*. The most remarkable result is that the correct attribution of *IS* and *ISD* improves if citizens think that one of the main objectives of public intervention is redistribution.

Finally, with regard to the socio-demographic control variables, the only regularity we can detect is that a higher level of education increases the probability of correctly identifying the assignment of taxes between levels of government, although being a college student reduces that probability for local taxes, presumably, because the student is unlikely to be a taxpayer of any of these taxes.

7 | CONCLUDING REMARKS

As opinion polls repeatedly show, most citizens resident in Spain are not able to correctly identify the taxes received by the different levels of government – especially the regional one – to finance their spending powers. Thus, we have tried to empirically establish the profile of those citizens who are best able to identify the allocation of taxes between levels of government. Consistent with the hypotheses that we have tested, our estimates suggest that these citizens are those who are able to identify the government that provides the services financed by these taxes, who correctly identify other taxes received by the same government, who reside in a foral region, and who enjoy a high level of education.

Based on these results, several policy recommendations arise. First, since the visibility of public services can help to improve the visibility of taxes, a key step is to improve the visibility of the distribution of functions between levels of government. On the tax side, the main lesson for the visibility of regional taxes can be drawn from the performance of the *FORAL* variable, the coefficients of which are only significant when the foral ACs exercise powers over their taxes that are not available to the other ACs, as is the case with *IRPF* and *IVA*. Therefore, an expansion of the competences of the common regime ACs on ceded taxes could help to increase the visibility of these taxes. According to our results, it is probably more important for this purpose to increase tax management powers than to

extend the regulatory competences (although this extension is very important to strengthen regional financial autonomy). In this regard, it should be recalled, first, that the exercise of regulatory tax powers has not proven to be significant in any case to explain tax visibility; second, that the foral ACs cannot exercise any regulatory powers over IVA, although they do manage it; and third, that, in some estimates, the fact of not having any relationship with the tax administrations (which is the case with non-tax filers, college students, and some immigrants) reduces the probability of adequately perceiving which government is entitled to a tax yield.

The last action that finds support in our estimates is the improvement of the educational level of the population. More educated citizens are also likely to be more politically sophisticated, that is, more prepared for and interested in issues related to public intervention (which does not necessarily imply a preference for such intervention), which may contribute to increased visibility in the allocation of expenditure-related competences and taxes among levels of government.

ACKNOWLEDGMENTS

We thank the Spanish Institute for Fiscal Studies for providing access to the Fiscal Barometer survey. We are also indebted to the Government of Aragon and the European Regional Development Fund (Public Economics Research Group) for their funding.

CONFLICT OF INTEREST STATEMENT

No conflicts of interest have to be disclosed.

DATA AVAILABILITY STATEMENT

Data available on request from the authors.

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How to cite this article: López-Laborda, J., Rodrigo, F., & Sanz-Arcega, E. (2023). Do you know to whom you pay your taxes? The case of decentralised Spain. *Social Policy & Administration*, 57(5), 770–788. <https://doi.org/10.1111/spol.12910>

APPENDIX

TABLE A1 Construction of independent variables

Variable	Level	Construction*	Expected sign
CENTRALEXVISIB	1	1 if the individual correctly attributes the main responsibility for providing unemployment benefits and/or pensions to the central government	+
REGIONALEXPVISIB	1	1 if the individual correctly attributes the main responsibility for providing education and/or health services to ACs	+
LOCALEXPVISIB	1	1 if the individual correctly attributes the responsibility for public lightning and/or garbage collection to the local level	+
UNEMPLOYUSER	1	1 if the individual herself or any individual's family members have benefited during the previous year of unemployment benefits	+
EDUCATIONUSER	1	1 if the individual herself or any individual's family members have consumed public education during the previous year	+
HEALTHUSER	1	1 if the individual herself or any individual's family members have consumed public health care services during the previous year	+
TRANSPARENCY	2	Increase in the economic-financial regional transparency score, elaborated by <i>Transparencia Internacional España</i> , between 2014 and 2016: See https://transparencia.org.es/indice-de-las-comunidades-autonomas-incau/ .**	+
NOREGIONALTV	2	1 if the individual lives in an AC where regional public TV channels do not exist – Cantabria, Castile and Leon, Navarre and La Rioja–	–
HIGHLEVEL	2	1 if the individual lives in regions that experienced a high level of devolution from the very beginning of the decentralisation process	+
MAJORITY	2	1 if the individual lives in a region with an absolute majority government. This happens only in Galicia	?
REGTAXVISIB	1	1 if the individual correctly attributes to regions (to provinces in case of subjects living in the Basque Country) revenues from at least one of the remaining regional (or provincial) taxes	+
LOCALTAXVISIB	1	1 if the individual correctly attributes Property Tax and Vehicle Tax revenues to the local level of government	+
NOTAXPAYER	1	1 if the individual does not have to submit a tax return (presumably income tax form)	–
SELFFINANCING	2	1 if the individual lives in Madrid, the Balearic Islands, Navarre or the Basque Country	+
REGIRPFRATE	2	Regional top marginal rate of the IRPF where the individual lives	+
REGITPAJDRATE	2	Regional top marginal rate of the capital transfer tax where the individual lives	+
NOINHERITAX	2	1 if the individual lives in ACs where no Inheritance Tax is collected for inheritances to close relatives in 2015 (Cantabria, La Rioja, Madrid, Balearic Islands and Castile-La Mancha)	+
NOGIFTTAX	2	1 if the individual lives in ACs where no Gift Tax is collected for gifts to close relatives in 2015 (Madrid or Castile-La Mancha)	+
IRPFWEIGHT	2	Percentage that IRPF tax collection represents over total regional taxes (1)/ non-financial revenues (2)	+
IVAWEIGHT	2	Idem for IVA	+
ISDWEIGHT	2	Idem for ISD	+

(Continues)

TABLE A1 (Continued)

Variable	Level	Construction*	Expected sign
ITPAJDWEIGHT	2	Idem for ITPAJD	+
FORAL	2	1 if the individual lives in a foral region	+
PUBLICSECTOR	1	1 if individual agrees or strongly agrees with the following statement: "Public Sector exerts a necessary social function"	+
REDISTRIBUTION	1	1 if the individual agrees or strongly agrees with the following statement: "One of the main objectives of the tax and benefit system must be the reduction of economic inequality"	+
POPULARPARTY	2	1 if the individual lives in a region governed by the Popular Party, PP (Galicia, Madrid, La Rioja, Murcia and Castile-Leon)	-
AGE/AGE ²	1	Age of the individual	+/-
FEMALE	1	1 if the individual is a woman	¿?
COUPLE	1	1 if the individual is married or lives with a stable partner	¿?
IMMIGRANT	1	1 if the individual is an immigrant	-
BIGCITY	1	1 if the individual lives in a city with more than 200,000 inhabitants	+
RURAL	1	1 if the individual lives in a town with less than 10,000 inhabitants	-
SECEDUCATION	1	1 if the individual's highest level of education is secondary (high school) education	+
TERTEDUCATION	1	1 if the individual's highest level of education is tertiary (college) education	+
UNIVERSITY	1	1 if the individual is a university student	+
BUSINESS	1	1 if the individual is a professional or a businessman	+
SALARIED	1	1 if the individual is a salaried worker	+
UNEMPLOYED	1	1 if the individual is unemployed	-
RETIRED	1	1 if the individual is retired	+

Note: (*) Unless otherwise stated, all variables are dummies. (**) The economic-financial score is based on 16 items dealing with budgetary, accountancy, expenditure, and revenue-related issues. We use the annual index at the regional level, because the local level index is only available for the 110 largest municipalities.

Source: Own elaboration.

TABLE A2 Descriptive statistics

	Mean	Median	Maximum value	Minimum value	Standard deviation	Coefficient of skewness	Coefficient of kurtosis
Endogenous							
IRPFVISIB	0.07	0	1	0	0.25	3.46	12.97
IVAVISIB	0.05	0	1	0	0.22	4.06	17.46
ISVISIB	0.48	0	1	0	0.50	0.07	1.01
ITPAJDVISIB	0.24	0	1	0	0.43	1.21	2.45
ISDVISIB	0.26	0	1	0	0.44	1.09	2.19
IBIVISIB	0.45	0	1	0	0.50	0.19	1.04
IVTMVISIB	0.55	1	1	0	0.50	-0.19	1.04
Exogenous							
CENTRALEXPVISIB	0.90	1	1	0	0.30	-2.63	7.94
REGIONALEXPVISIB	0.59	1	1	0	0.49	-0.37	1.13
LOCALEXPVISIB	0.91	1	1	0	0.29	-2.84	9.04
UNEMPLOYUSER	0.20	0	1	0	0.40	1.49	3.23
EDUCATIONUSER	0.44	0	1	0	0.50	0.23	1.05
HEALTHUSER	0.93	1	1	0	0.25	-3.41	12.65
TRANSPARENCY	0.32	0.26	0.89	-0.11	0.35	0.18	1.42
NOREGIONALTV	0.09	0	1	0	0.29	2.86	9.17
HIGHLEVEL	0.61	1	1	0	0.49	3.63	14.21
MAJORITY	0.06	0	1	0	0.24	3.61	14.04
NOTAXPAYER	0.28	0	1	0	0.45	0.96	1.91
SELFFINANCING	0.22	0	1	0	0.41	1.35	2.82
REGIRPFRATE	0.21	0.24	0.265	0.21	0.02	-0.30	1.54
REGITPAJDRATE	0.08	0.1	0.11	0.06	0.03	-1.94	6.37
NOINHERITTAX	0.22	0	1	0	0.42	1.33	2.76
NOGIFTTAX	0.18	0	1	0	0.38	1.67	3.80
IRPFWEIFGT (1)	0.35	0.35	0.50	0.28	0.05	0.71	2.95
IRPFWEIGHT (2)	0.25	0.22	0.56	0.13	0.07	1.40	5.41
IVAWEIGHT (1)	0.34	0.34	0.40	0.24	0.03	-0.96	3.83
IVAWEIGHT (2)	0.24	0.22	0.37	0.11	0.05	0.27	4.74
ISDWEIGHT (1)	0.03	0.04	0.06	0.01	0.01	0.45	4.94
ISDWEIGHT (2)	0.02	0.02	0.04	0.01	0.01	1.04	5.66
ITPAJDWEIGHT (1)	0.08	0.08	0.16	0.01	0.03	-0.19	3.23
ITPAJDWEIGHT (2)	0.05	0.05	0.15	0.01	0.02	0.89	5.25
FORAL	0.06	0	1	0	0.24	3.63	14.21
PUBLICSECTOR	0.87	1	1	0	0.34	-2.20	5.82
REDISTRIBUTION	0.80	1	1	0	0.40	-1.47	3.15
POPULARPARTY	0.29	0	1	0	0.45	0.92	1.85
AGE	48.80	48	90	18	17.14	0.15	2.12
FEMALE	0.51	1	1	0	0.50	-0.05	1.00
COUPLE	0.61	1	1	0	0.49	-0.47	1.22

(Continues)

TABLE A2 (Continued)

	Mean	Median	Maximum value	Minimum value	Standard deviation	Coefficient of skewness	Coefficient of kurtosis
INMIGRANT	0.03	0	1	0	0.17	5.48	31.04
BIGCITY	0.29	0	1	0	0.45	0.93	1.87
RURAL	0.22	0	1	0	0.41	1.36	2.84
TERTEDUCATION	0.17	0	1	0	0.38	1.75	4.07
SECEDUCATION	0.60	1	1	0	0.49	-0.42	1.18
BUSINESS	0.11	0	1	0	0.31	2.48	7.17
RETIRED	0.24	0	1	0	0.43	1.22	2.50
UNIVERSITY	0.06	0	1	0	0.24	3.72	14.86
SALARIED	0.38	0	1	0	0.48	0.50	1.25

Source: Own elaboration.