The Determinants of Taxation Innovation Policy in Spain's Common Regime Autonomous Communities (1986–2018)

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This article studies the determinants of tax innovation in Spain's *Common Regime* Autonomous Communities (ACs) over the period 1986–2018, across the different types of taxes included in their "own taxes." Our central finding is that the introduction of taxes is motivated by politics: ACs governments introduce taxes when governed by left-wing parties or by a coalition government that included a regionalist party. Second, we find that parties in government follow a strategic calculus when introducing new taxes: an approaching election and a previously introduced tax decrease the chances of tax innovation. Third, we find that AC government also respond to functional pressures and introduce new taxes to shore-up their revenues when faced with a budget deficit. Two important negative results to come out of this analysis are that taxation innovation is not sensitive to geographical diffusion or to the availability of alternative source of revenue in the system of territorial financing.

In December 2012, while Spain was in the throes of an economic crisis, the Catalan government introduced a widely publicized tax on deposits held by the banks operating on its territory. This mirrored a decision spearheaded by other Autonomous Community (AC) governments, including Extremadura, Asturias, Andalusia, and Canarias. This measure was projected to provide around €500 m in additional funds at a time when the recession was drying-up the Catalan government's revenues and the central government had "constitutionalised" its European commitment to balanced budgets. It also offered a way to regulate a sector which was perceived to have amplified the effects of the global financial crisis in Spain. An important component of this policy was that deductions were available to banks with the widest network of branches and to those offering loans to economic development projects in Catalonia (CatNews 2012). Finally, the measure offered a way for the government to claim authority over what counted as its "own taxes." It was an ambitious move that was opposed by the central

Publius: The Journal of Federalism volume 54 number 1, pp. 88–120
https://doi.org/10.1093/publius/pjad027
Advance Access publication 5 July 2023

government, engendering a conflict of competence that was ultimately handed to the Constitutional Court for adjudication (CatNews 2013; Platero Alcon 2016).

This anecdote shows that taxation serves several purposes: it generates revenue for treasuries, it regulates the behavior of corporations, and it is a highly symbolic trapping of statehood. It also highlights the variable way in which taxation has been deployed by ACs in Spain. The Catalan government has been active in introducing new taxes across different fields. Governments in other regions of Spain have been far more reticent. The AC Madrid, for instance, has made a point of projecting itself as a low-tax regime to attract investment, to incentivize the location of corporate headquarters in the region and to encourage private activity among the region's SMEs (*The Economist* 2021). This generated a debate about inter-jurisdictional tax competition more commonly found in fiscally decentralized federations such as the United States (CERFA 2017). Exploring this notable variation in the taxation policy of regions offers the possibility of answering two questions central to the study of fiscal policy in decentralized systems: When and why do regional governments employ the taxation authority at their disposal? What explain the taxation policy choices of these regional governments?

In this article, we answer these two questions by investigating the taxation policy of Spain's *Common Regime* ACs from 1986 to 2018. We explain the tendency of AC governments to engage in what Berry and Berry (1992) called "tax innovation"—i.e., the introduction of new taxes—across the different types of taxes that constitute AC's "own taxes."[1] Understanding the factors driving tax innovation can shed light on the motivations for the divergent policies adopted by the ACs of Catalonia and Madrid. It also holds the promise of advancing the research agenda in the fields of fiscal federalism and regulatory federalism. This article achieves this in three ways.

First, it studies the fiscal behavior of sub-national units. The "second generation" theory (SGT) of fiscal federalism (Oates 2005) focuses on how territorial financing affect *national-level* macroeconomic outcomes, from budgetary deficits and inflation (Rodden and Wibbels 2002) to the size of the public sector (Rodden 2003) and the success of economic reform (Wibbels 2005). These analyses laud the benefits of taxation autonomy and a "strong" budget constraint for economic performance. But insufficient attention has been paid to studying whether and how *sub-national-level* units make use of their taxation powers. If it is the decisions of constituent units that shapes national-level outcomes, then the determinants of those decisions merit further investigation. As Rodden and Wibbels (2002, 529) conclude: "to the degree that provincial politics is important, research in comparative federalism must turn to the constituent unit level of analysis. What political factors influence fiscal behaviour at the provincial level?" Studying subnational taxation in Spain offers a way of taking-up this suggestion. The Spanish territorial financing regime's historic reliance on intergovernmental

grants to finance subnational spending should produce the worst "pathologies" of federalism (Weingast 2009, 280). Yet, because the level of reliance on central grants is not uniform across ACs or over time, these perverse incentives are not uniformly present. This article sets out to identify their effects on the fiscal behavior of ACs, relative to other economic and political considerations.

Second, this article expands the scope of inquiry into the fiscal behavior of subnational units to include taxation policy. Research on the disciplining effects of territorial financing formulas has focused on the *spending* behavior of regional governments (e.g., Rodden 2002; Asatryan, Feld and Geys 2015). The study of subnational taxation has a more established record in countries that have exercised high degrees of fiscal autonomy, such as the United States (Mikesell 1978; Hansen 1983). But in countries that decentralized taxation powers more recently, like Spain, it is less well developed (Sanz Gómez 2017). That may be because regional governments are averse to the electoral and budgetary risks of taxation innovation (Poole 2017). Yet, the highly politicized divergent tax policies of Catalonia and Madrid suggest that the incipient research into the taxation policies of subnational units (e.g., Ashworth, Geys and Heyndels 2006) merit greater attention.

Third, studying taxation policy offers a way to integrate two research traditions—fiscal federalism and regulatory federalism—which have so far followed distinct trajectories. Taxation lies at the interface of these traditions because it encompasses policy measures that are designed to generate revenue and regulate behavior. Fiscal federalism has conceived taxation primarily as a means of generating revenue (c.f. Besley and Case 1995), which explains the focus on taxes that generate large receipts, such as personal and corporate income, VAT, or sales tax. Regulatory federalism, in contrast, focuses on the rules (Kelemen 2009) designed to modify the market behavior of firms and consumers and to curb behavior that generates negative externalities. This ranges from limiting air pollution (Rabe 2009) to ensuring they meet minimum workplace safety standards (Bradbury 2006). Taxes are part of these regulatory measures: The objective of 'Pigouvian' taxes is to induce changes in the outputs of private actors by ensuring that they internalize the social cost of negative externalities (Aidt 1998). Environmental taxes like the carbon tax are a case in point. Taxes thus serve different purposes depending on their purpose and target. But probing the determinants of taxation policy among Spanish ACs offers a way to ascertain the different factors that shape those motivations.

In the next section, we detail how "own taxes" are situated within the revenue structure of *Common Regime* ACs and outline the different types of fiscal and regulatory taxes included in this category. To explain taxation innovation, we present in the subsequent section a theoretical framework, drawn from the fiscal federalism and political economy literature that assigns importance to functional pressure, political factors, and contextual conditions. We then verify that

framework by conducting a series of logistic regressions of taxation innovation, across fifteen *Common Regime* ACs from 1986 to 2018. The conclusion summarizes the results.

Our analyses show that the introduction of taxes is motivated by politics. ACs governments introduce taxes when governed by left-wing parties or by a coalition government that included a regionalist party. Taxes are thus viewed as instruments for achieving redistributive goals, for defining the scope of territorial autonomy and for shaping the regional community. This is evident from the specific incidence of innovation across different types of taxes: property taxes that target assets such as land or capital held in banks were likely to be introduced by left-wing parties, while the introduction of environmental taxes was less sensitive to partisan left-right ideology but was more likely under a governmental coalition that included a regionalist party. We also find that parties follow a strategic calculus and show an awareness of the temporal context when introducing new taxes: an approaching election and a previously introduced tax decrease the chances of tax innovation. Again, the effects of these variables are stronger in ACs governed by a left-wing party.

Our second set of results show that AC government also respond to functional-economic pressures and introduce new taxes to shore-up their revenues when faced with a budget deficit. The effect of a region's fiscal health was evident in the tendency to impose taxes on specific activities such as tourism, which are perceived as straightforward sources of revenues. But politics matters here too, as left-wing parties are more responsive to this pressure. Finally, one notable finding is that taxation innovation is not sensitive to the availability of alternative source of revenue, such as inter-governmental transfers. Contrary to the expectations of the SGT of fiscal federalism, such revenues do not depress the impetus of regions to use their constitutional authority to introduce new taxes.

Territorial Financing in Spain

Since 1978, Spain has evolved from a unitary state into a highly decentralized state. ACs emerged as new political entities between 1979 and 1983. From the start, decentralization was marked by a double asymmetry between *Foral* ACs (the Basque Country and Navarra) that were granted complete taxation autonomy and the *Common Regime* ACs that relied on inter-governmental transfers to finance their policy responsibilities,[2] and between the historic nationalities (Andalusia, Basque Country, Catalonia, Galicia) that adopted a "fast route" to autonomy and nonhistoric regions that adopted a "slow route." Over the course of several "waves" of decentralization, *Common Regime* ACs were granted responsibilities for the provision of a wide range of costly public services, such as health and education, agriculture, industry, environmental, or regional infrastructures. By

2001, the ACs that had adopted the "slow route" had converged with the others, such as there was an important degree of homogeneity across expenditure competences, which accounted at the time for around 35 percent of public expenditure (Lago-Peñas, Fernández-Leiceaga, and Vaquero-García 2017). But the financial crisis (2007–2009) and sovereign debt crisis (2009–2014) had an important impact on this system. In 2012, the central government made fiscal consolidation the key target of its economic policy and imposed on ACs strict expenditure ceilings and control mechanisms over their public spending, as well as severe adjustment programs backed up by a system of sanctions.

The system of revenue assignments to ACs also decentralized gradually, in an asymmetric and complex fashion. Among the *Common regime* ACs, this complexity stems from the multiplicity of revenue sources, the opacity of how inter-governmental transfers are calculated, the weak degree of fiscal responsibility (CERFA 2017), and the significant inter-regional differences in financing (Herrero Alcalde et al. 2015). The next section places "own taxes" within AC's overall revenue structure.

The Revenue Structure of Common Regime ACs

Grounded in the 1978 Spanish Constitution (SC), the *Common Regime* was established in 1980 by the *Ley Orgánica de Financiación Autonomica*, (LOFCA), and was amended in 1986, 1992, 1996, 2001, and 2009 (León 2015). Following these reforms, the financing model evolved from one based on centralized tax collection and conditional transfers to one based on three pillars: (1) inter-governmental transfers, equalization grants, and conditional transfers, (2) "shared" taxes, and (3) "own taxes" (CERFA 2017, 3). However, the share of each of the three pillars in the revenue structure varies from ACs to ACs.

1. Inter-governmental transfers and equalization grants are designed to guarantee that all ACs have the same level of resources to provide public services (Article 157.1b SC). There are four such payments: the Guarantee Fund for Fundamental Public Services, the Global Sufficiency Fund, the Competitiveness Fund, and the Cooperation Fund. The Guarantee Fund for Fundamental Public Services is the main equalization instrument, as it generates sizable horizontal flows from rich to poor ACs and reduces regional disparities in per capita financing (De la Fuente 2016). It is calculated as the difference between the expenditure needs of each AC in the "fundamental public services" (education, health, and social service) and 75 percent of their "fiscal capacity," measured as the potential revenue collected from "ceded" taxes (see paragraph below) plus some fees and charges.[3] The Global Sufficiency Fund on the other hand aims to preserve revenue levels at the time of the 2009 reform, meaning that revenues for ACs are maintained with

respect to the year of reference 2007; it is calculated for each AC as the difference between the expenditure needs and the tax revenues and the transfers from the Guarantee Fund. To reduce the standard deviation of financial resources across ACs, the Law 22/2009 created two unconditional grants: the Competitiveness Fund, which offers resources for ACs that are below the national average, and the Cooperation Fund, which provides additional financing for ACs with low-income per capita, population growth or population density. To reduce regional disparities in income, some ACs also receive grants from the Inter-Territorial Compensation Funds and conditional grants from the European Regional Development Fund; some ACs also receive conditional grants from the central government to finance certain regional or joint projects (CERFA 2017, 35).

2. *Shared* (or "*ceded*") *taxes*, are either completely or partially ceded (Article 157.1a SC). *Completely ceded* taxes are taxes over which the AC governments are responsible for the collection and management, and over which they can apply regulatory modifications.[4] *Partially ceded* taxes are taxes over which the central government retains responsibility for collection and management, but over which ACs can increase rates and decide on tax deductions; they cannot however determine the tax base or sharing formula. Table 1 below presents the different types of completely and partially ceded taxes and the years in which modifications in regulatory powers were introduced. In 1997, ACs were allowed to set the tax rate and to establish tax credits and allowances. The 2001 reform expanded the proportion of "shared taxes" as the main source of revenue for ACs: 33.3 percent of the personal income tax (*Impuesto de Renta Personas Fisicas*, IRPF) was shared and based on AC regulation. The reform also included the sharing of VAT (35 percent) and excise tax (40 percent). The 2009 reform increased the regional share to 50 percent of IRPF and 50 percent of VAT (López Laborda 2010).

3. "*Own*" *taxes* are those that ACs have the power to introduce and abolish, to define the tax base and rate, and to grant tax deductions (Blöchliger and Rabesona 2009). Moreover, the revenue from own taxes belongs entirely to AC governments. There exists a broad constitutional basis for the establishment of "own" taxes (Article 156.1, Article 157.1b, Article 133.2 of the 1978 SC). However, there is an important constraint: ACs cannot impose a tax on a base that is controlled by central or local governments. Since these two bodies had established taxes on most bases, there was in practice little tax room left to ACs. Moreover, the LOFCA prohibits ACs from imposing barriers to the functioning of the internal market and further constraints are set by the EU competition law that interprets certain taxes as a state-aid.[5] Over time, however, AC governments have found space to introduce a range of new taxes that can be classified into three categories shown in table 2: environment, property, and activity taxes.

Table 1 Evolution of regulatory powers on "own taxes" and "ceded taxes" of the common regime autonomous communities

	Yields assigned (%)			Regulatory capacity			Tax administration by ACs	Power to introduce and abolish	Criteria for distribution among the ACs
	1997	2001	2009	1997	2001	2009			
Own taxes		100%			100%		Yes	Yes	Belongs to ACs
Partially ceded taxes									
Income tax	30	33	50	limited	Medium: determination of the rate and deductions	High: rate and deductions, minimums (±10%) on AC share	No	No	Residence of the taxpayer
VAT	–	35	50	No	No	No	No	No	AC Households consumption
Special taxes	–	40	58	No	No	No	No	No	Consumption in AC
Electricity tax	–	100	100	No	No	No	No	No	Consumption in AC
Tax on retail sales of certain hydrocarbons	–	58	58	No	Limited	High: rate on the AC share	No	No (since 2012 removed)	Consumption in AC
Completely ceded taxes									
Inheritance tax (ISD)	100	100	100	Limited	High	High: rate, existing assets, deductions and allowances.)	Yes	No	Residence of the deceased or donee, location of property

Wealth tax (IP)	100	100	100	Limited	Limited	High: rate, deductions and rebates	Yes	No	Residence of the taxpayer
Gambling taxes (TJ)	100	100	100	Limited	Limited	High: tax base, tax rates and flat rates, allowances, exemptions	Yes	No	Licences and benefits obtained in ACs
Estate and property transfer tax (ITPAJD)	100	100	100	Limited	Limited	High: rate, deductions and rebates	Yes	No	Location of the property, residence of the donee
Tax on certain means of transportation	–	100	100	No	Limited	Limited: rates (+15%).	Yes	No	Location of means of transportation

Source: Own elaboration based on CERFA, 2017:4.

The revenues that accrue from "own taxes" represent a small but not insignificant share of ACs' total budgets. Figure 1 shows that the size of revenues coming from 'own' taxes have been growing over time and that there is significant variation between ACs in the size of revenues that they derive from "own taxes." We can distinguish four types of ACs: those with a *low level* of "own taxes," representing less than 0.5 percent of revenue (e.g., Castilla-La Mancha, Madrid); those with a *medium level* of "own taxes," ranging between 1 and 2 percent of total revenue (e.g., Andalucia, Galicia); those with a *high level* of "own taxes," ranging between 2 percent and 3 percent (Cataluña, Aragon) and those with a *very high* level of more than 3 percent.

This variation in the size of revenues that each *Common Regime* AC generates from their "own sources" is reflected in their proclivity for taxation innovation over time. Figure 2 shows a timeline of the introduction of new taxes by individual ACs. We see that the first half of the 1990s and 2000s were periods of high taxation innovation, as was the period surround the economic crisis around 2012. This trend is especially pronounced in the highly active ACs such as Catalonia and Andalusia, in contrast to those that are inactive such as Castilla-y-León. Table 3 also presents a picture of when each AC introduced a new tax, according to type of tax.

The Determinants of Taxation Innovation in Common Regime ACs

The goal of this article is to explain this variation in taxation innovation. By "innovation," we understand the propensity of an AC government to introduce a new tax or to introduce a tax for the first time (cf. Walker 1969; Gray 1973). To do so, we bring together different arguments developed in the political economy and fiscal federalism literature that identify three sources of pressure for innovation: *functional pressures* associated with the fiscal "health" of ACs; *political pressures* associated with the ideological and electoral considerations that shape the motivations of parties; *contextual pressures* exerted by the temporal and geographical environment.

Functional Pressures

The political-economy literature outlines the *functionalist* logic shaping why regional governments adopt a new tax: it is shaped by short-term economic pressures that accrue from their budgetary position (Hansen 1983). The fundamental questions that regional executives ask when drawing-up the budget are: do we have the necessary resources to pay for our expenditure plans? If not, do we face the potential of spiralling deficits and unsustainable accumulated debts? In the United States, this scenario is ruled out by the constitutional requirement of states to show a balanced budget (Poterba 1994). In Europe, a similar

Table 2 AC governments "own taxes," by tax base

Environmental	Property	Activities
Use of water	Underutilized land	Specific facilities and economic activities.
Production or deposit of waste	Large commercial establishments	Gambling
Gas emissions	Bank deposits	Hunting
Plastic bags		Tourism

Source: Authors' own elaboration.

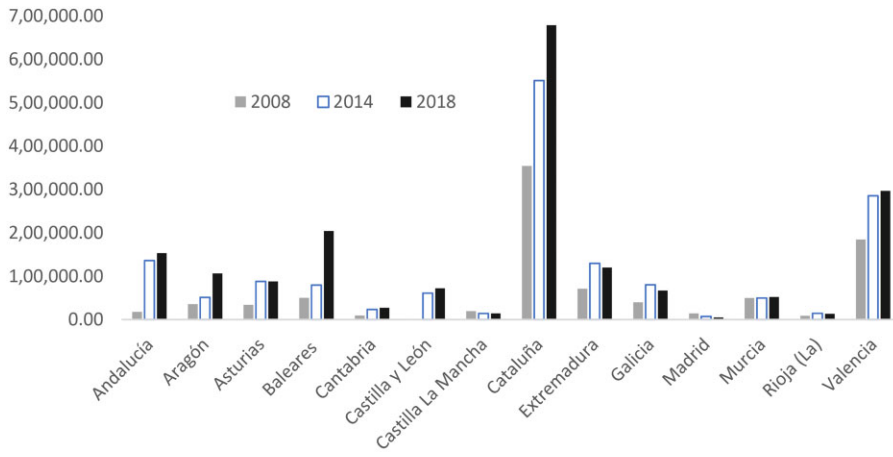

Figure 1 Level of "own taxes" by ACS in thousand EUR, (2008/2014/2018).

Source: Ministry of Finance, Government of Spain.

constitutional stricture was introduced during the Eurozone crisis (2012).[6] In the face of this budgetary constraint, ACs will introduce new taxes in order to generate revenue. But two other considerations will condition their response. They will first ask whether the regional economy is growing strongly enough to finance spending commitments without the need to introduce new taxes. Second, they will ask whether spending commitments can be financed from other sources of revenue. This is an appealing option for *Common Regime* ACs, the revenues of which are also derived from inter-governmental transfers. Research on U.S. states corroborate this: greater reliance on federal grant-in aid money results in a weaker fiscal "effort"' (Nicholson-Crotty 2008). In line with this functional reasoning, we posit the following four hypotheses:

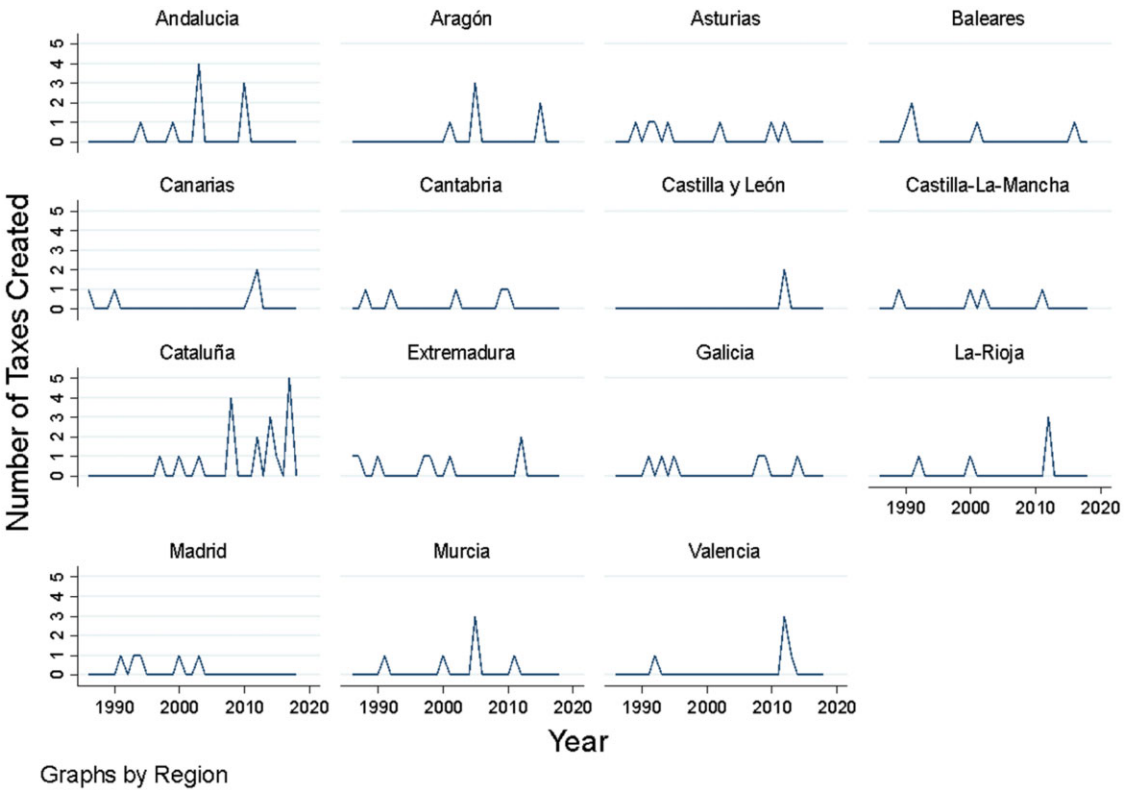

Figure 2 Timeline of tax legislation (1986–2018), by individual common regime Acs.

Source: Ministry of Finance and Public Administration, Government of Spain.

Table 3 Introduction of new tax across Acs, by year and type of tax

	waste-water	air pollution	environ-mental damage from reservoir water	radioactive and dangerous waste disposal	dischar-ges to coastal waters	plastic bags	Water rate	cable facilities/ transport	nuclear radiation	waste disposal	tourist accom-modation	wind power	Bank deposits	underu-tilized land tax/-buildings	Large commercial establish-ments	activities that affect the environ-ment	bingo gamb-ling	Surcharge on business tax	Tax on hunting/ Audio-visual content
Andalucía	2010	2003		2003	2003	2010							2010	1984			1999		
Aragón	2001	**2007**	2015					**2015**							**2007**				
Asturias	1994												2012	1989	2002	2010	1992	1991	
Baleares	1991										2001 envi./ 2016					1991	1990		
Cantabria	2002					2010				2009							1988	1992	
Castilla y León										2012						2012			
Castilla LM	2002											2011				**2000**	1989		
Cataluña	1981	2014					2003		2017	2008	2012		2012	2015	2000		1984		2014
Extremadura	2012									2012			2006	1986		1997			1990
Galicia	**1993**	1995	2008									2009					1991		
Madrid	1993									2003							1994	1991	
Murcia	2000	2005			2005					2005						2011	1984	1992	
Rioja (La)	2000									2012					2012			2012	
Valencia	1992	2012								2012			2013			2012	1985		

Source: Own elaboration.

H1/2: *if the budget deficit/stock of debt is high, tax innovation is more likely*

H3: *if economic growth is high, tax innovation is less likely*

H4: *if AC governments are more dependent on central government/EU transfer or on income from shared-taxes, tax innovation is less likely*

Political Pressures

Taxation decisions are also sensitive to political parties' goals of winning elections (electoral cycle model) and realizing their programmatic commitments (partisan model). In the partisan model, left-wing parties prefer higher levels of public spending and taxation than right-wing parties (Blais et al. 1993). This effect has been found among U.S. governments (Alt and Lowry 1994), on the introduction of carbon taxes in Flemish municipalities (Ashworth, Geys, and Heyndels 2006) and property taxes in Spanish municipalities (Delgado, Lago-Peñas, and Mayor 2011). Taxation thus offers a way for parties to meet classical political objectives, such as reducing inequalities. Such objectives also include the commitment to make firms pay for practices deemed uncompetitive and to make consumers pay for activities deemed inefficient. The potential of taxes to "nudge" firms and consumers towards a welfare-enhancing direction will appeal to regional governments in a plural state such as Spain, which features several regionalist and nationalist parties that incarnate different forms of regional distinctiveness (Pallarés, Montero, and Llera 1997). The circumscribed electoral appeal of these parties and their ongoing competition against state-wide parties with a national orientation, means that they will likely view taxation as a means both of asserting territorial autonomy in a policy area that is emblematic of statehood and of shaping the socio-economic development of their regional political community.

Despite their potential, however, taxes are also risky innovations that are seldom popular with the public. Because of their desire to be re-elected, parties in government are expected to behave opportunistically in function of the election cycle and to resist introducing new taxes in an election year. There is evidence to support the expectation that an approaching election reduces innovation in the case of municipal taxation in Flanders (Ashworth, Geys, and Heyndels 2006) and Spain (Delgado, Lago-Peñas, and Mayor 2011). Kneebone and McKenzie (2001) find that the effect is so important that it mutes the effect of ideology. This incentive to do the popular thing at election time also depends, however, on parties' perceptions about their chances of winning. Frey and Schneider (1978) develop the insight that opportunistic behavior is more likely, the less certain

parties are of their chances of winning. This results in several additional hypotheses:

H5: *if a party in regional government is left-wing, tax innovation is more likely*

H6: *if there is a regionalist party in government, tax innovation is more likely*

H7: *the nearer (further) an election, the less (more) likely is a tax innovation*

H8: *the more (less) competitive an election, the less (more) likely is tax innovation*

Contextual Pressures

The literature on state policy diffusion in the United States (Graham, Shipan and Volden 2013) shows that regional governments are also sensitive to external pressures generated by the geographic and temporal context. State governments monitor their neighbors' policies which leads contiguous constituent units to adopt similar policies. There is evidence of such "tax mimicking" between states in the United States (Case et al. 1993), as inter-jurisdictional competition for mobile citizens and business means that regional governments have the strategic incentive to minimize policy differences and engage in tax-competition (Rom et al. 1998; Bailey and Rom 2004). But even in the absence of such migration, external pressures can be produced by electoral spill-overs across jurisdictions, if informed voters "benchmark" their own jurisdiction's tax policy against that of a neighboring jurisdiction (Besley and Case 1995). This is why policy diffusion is found even among consumption taxes, the revenue from which is not as sensitive to inter-jurisdictional migration as income tax (Nelson 2002).

Regional governments also learn from their own experience with tax innovation. But this learning process takes time: if an AC government has introduced new taxes, it will take time before it is accustomed to the technicalities of their deployment and before it has assessed their effectiveness in attaining its revenue-raising or regulatory objectives. The passing of time that is required for the internalization of this learning experience shapes incentives to introduce new taxes. This explains, for instance, the staggered "time to adoption" of sales taxes across jurisdictions (cf. Afonso 2016). These contextual pressures generate two additional hypotheses:

H9: *the higher the proportion of neighboring ACs that have introduced a new taxes, the more likely is tax innovation*

H10: *the longer the time-period without a tax innovation, the higher the probability of tax innovation*

Data and Measures

The objective of our analysis is to estimate the influence that these *functional, political*, and *contextual pressures* exert on tax innovation among *Common Regime* ACs in the period 1986–2018.[7] If we consider fifteen ACs from 1986 to 2018, we obtain a dataset of 495 (=15*33) observations in which each observation is an AC in a specific year.

Dependent Variable

The dependent variable is a dummy variable "*Tax innovation*" that equals 1 if the AC has introduced any tax in any given year, and 0 if not. Our source for this information is the Government of Spain's (n.d.) Ministry for Budget and Public Function. Although it is quite rare, we recognize that an AC can introduce more than one tax in any given year. We study this outcome using a count model (Model 10, Supplementary Appendix A2) that considers the number of taxes created as the dependent variable. This does not affect the results. Table 4 shows the descriptive statistics our dependent and independent variables, which we organize according to types of pressures.

Functional Pressures

(i) *Budget deficit* is calculated as (Spending—Revenues)/Revenues in the previous year. We use total nonfinancial operations (*obligaciones/derechos reconocidos*) and budget liquidation data. Source: Ministry of Finance and Public Administration (1986–2001) and BADESPE (Fiscal Studies Institute 2002–2016).[8]

(ii) *Stock of debt* is measured in millions of euros in the previous year. Source: Bank of Spain. For the years 1994–2018, the data are available on the Bank of Spain website.[9]

(iii) *Economic growth* is measured as the percentage of "output gap," the difference between Real GDP and Potential GDP. Source: A Hodrick Prescott Filter is used to estimate the Potential GDP based on data from De la Fuente (2019).

(iv) *Transfers from central government:* is measured as per capita transfers in 2010 euros for the period 1986–2018. Source: BADESPE. This includes: Guarantee Fund, Global Sufficiency Fund, Competitiveness Fund, Cooperation Fund, investment agreements and contracts, and health and social services transfers.

(v) *European Funding per capita*: include payments to ACs in the period 1990–2016 from the European Regional Development Fund (ERDF), the European

Table 4 Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Region	15				
Tax innovation	495	0.14	0.34	0	1
Number of taxes created	495	0.19	0.56	0	5
Environmental tax	495	0.06	0.25	0	1
Property tax	495	0.03	0.17	0	1
Activity tax	495	0.07	0.25	0	1
Functional pressures					
Budget deficit prior year	480	0.07	0.11	−0.5	0.5
Stock of debt prior year	480	5.052	10.104	7.212	77.739
Output gap (%)	495	−0.00	0.03	−0.69	0.09
Ceded taxes per capita	465	1.009	821	0	2.899
Transfers per capita	465	776	612	0	2.737
Total resources per capita	465	2.283	1.182	274	4.518
European Funding per capita	361	85	83	0	572
Political pressure					
Ideology (Left =1)	495	0.41	0.49	0	1
Election cycle = 0	495	0.23	0.42	0	1
Election cycle = 1	495	0.27	0.45	0	1
Election cycle = 2	495	0.24	0.43	0	1
Election cycle = 3	495	0.25	0.43	0	1
Competitiveness of an election	495	0.14	0.08	0.0	0.4
Electoral year dummy	495	0.23	0.42	0	1
Regional coalition	495	0.35	0.48	0	1
Contextual pressures					
Diffusion effect (any tax)	495	0.12	0.21	0	1
Diffusion effect environmental tax	480	0.06	0.15	0	1
Diffusion effect activity tax	480	0.06	0.14	0	1
Diffusion effect property tax	480	0.03	0.10	0	1
Number of years a tax was not introduced	480	4.64	4.72	0	26

Agricultural Fund for Rural Development (EAFRD), and the European Social Fund (ESF). Source: European Commission.

(vi) *Total "ceded" taxes per capita.* are tax revenues that accrue to ACs total ceded taxes, measure in 2010 euros for the period 1986–2018. Source: BADESPE

(vii) *Total fiscal resources per capita:* are total per capita resources for an AC government in any year, in 2010 euros for the period 1986–2018. Source: BADESPE

Political Pressures

(i) *Ideology* is a dummy variable that equals 1 if the political party in control of the AC government or the major coalition partner in the AC is left-wing (more than 50 percent of Parliamentary seats), 0 on the contrary. Data are gathered from Nordsieck (2014).
(ii) *Regionalist party coalition* is a dummy variable that equals 1 if the AC (coalition) government includes a regionalist party.
(iii) *Election cycle* is a categorical variable that measures the difference in years between the next election date and the current year. It equals 0 if the year corresponds to an electoral year, 1 if the distance to the next election is 1 year, 2 if it is two years, 3 if it is three or four years. As an alternative measure, we introduce a dummy variable *Electoral Year*, that equals 1 if the year is an electoral year and 0 otherwise.
(iv) *Competitiveness* is measured by the difference in vote share between the winning and the runner-up party. We draw this data from Nordsieck (2014).

Contextual Pressures

(i) *Diffusion effect* is measured as the percentage of neighboring ACs that have introduced a tax in the previous year. We lag these variables by one year, as ACs need time to observe a change in a neighboring government's taxation policy. When conducting the analysis by type of tax (environmental, property, activity), we consider the behavior of neighboring ACs in each type of tax.
(ii) *Time dependence* counts the number of prior years that the variable "tax innovation" equals 0. So, if in the prior year, there was a tax innovation, time dependence will be 0. We also consider an alternative regressor capturing the number of taxes created in the prior year by a specific AC: for instance, it is more likely that an AC will introduce a tax if, in the prior year, it only introduced one tax rather than say five taxes.

Model

For the estimations of the dependent variable "Tax innovation" we have the following:

$$y = \{1 \ \textit{The AC introduces a tax in a given year}$$

$$0 \ \textit{The AC does not introduce a tax in a given year}\}$$

The goal is to estimate the probability that an AC introduces a tax in a given year, based on the independent variables considered. The equation used to estimate this likelihood is

$$\begin{aligned} Tax\ \ Innovation_{i,t} = \varphi(\alpha &+ \beta_1 BudgetDeficit_{i,t-1} + \beta_2 StockofDebt_{i,t-1} \\ &+ \beta_3 percent\ \ output\ \ gap_{i,t} + \beta_4 Ideology_{i,t} + +\beta_5 ElectionCycle_{i,t} \\ &+ \beta_6 Comp.Election_{i,t} + \beta_7 Reg.coalition_{i,t} \\ &+ \beta_8 DiffusionEffect_{i,t-1} + \beta_9 NumberofTaxesCreatead_{i,t-1} \\ &+ \beta_{10}\text{Financial System}) \end{aligned}$$

A way to guarantee that the fitted values will be in the $\lfloor 0, 1 \rfloor$ interval is by considering the logistic transformation.[10]

The pooled logit model is the usual cross-section model,

$$Pr(x_{it}) = F\left(x'_{it}\beta\right)$$

Where $F(z) = e^z/(1 + e^z)$ is the logistic distribution function.

The logistic model assumes:

$$ln\ \left(\frac{p}{1-p}\right) = x'_{i,t}\beta + u$$

Where p is the probability that an event occurs.

Operating algebraically and by considering $x'_{i,t}\beta + u = z$,

$$ln\ \left(\frac{p}{1-p}\right) = z$$

$$\frac{p}{1-p} = e^z$$

$$p = \frac{e^z}{1+e^z}$$

In this sense,

$$p = \frac{e^z}{1+e^z} = F(z) = F(x'\beta)$$

The logistic regression model is nonlinear, but it is linear in a logarithmic scale as

$$ln\left(\frac{p}{1-p}\right) = z$$

$$ln\ (p) - ln\ (1-p) = z$$

$$ln\ (p) - ln\ (1-p) = x'\beta + u$$

That is, the difference in the probability that an event will occur with respect to the fact that it does not occur is linear but on a logarithmic scale. Therefore, the meaning of the coefficients, although keeping a certain relationship with the linear regression model, will be somewhat more complex to interpret. To sum up, there are two ways of express the logistic model. The first one is called *Logit*, and the second one, *odds-ratio*.

$$ln\ (p) - ln\ (1-p) = x'\beta + u$$

$$\frac{p}{1-p} = e^{x\prime\beta}$$

For the logit model, the sign of the coefficient is also the sign of the marginal effect $(\partial p/\partial x_{it})$, where p is the probability $p = Pr(x)$. But, the coefficient and the marginal effect are not the same. While in linear models the marginal effect is given by the coefficient β, in the logit model, the marginal effect is given by the following equation: $F(x'\beta)\Big\{1 - F(x'\beta)\beta_j$. The logistic regression coefficients give the change in the log-odds of the outcome for a one unit increase in the predictor variable. One of the limitations of this model is that it assumes independence over regions (i) and years (t), leading to potential efficiency loss (Cameron and Trivedi 2009). A cluster-robust estimate of the variance–covariance matrix of the estimator (VCE) is then used to correct for standard error correlation over time for a given region. We also include a data panel estimation that contemplates fixed effects at the AC level. This controls for every aspect from each AC that has not varied over time and is unobservable.

Results

We first consider the probability of adopting a tax for all types of taxes during the entire period and then disaggregate the data-set into different time-periods and types of taxes. We present in table 5, the results of the first analysis.

- Model 1 shows the estimates considering a linear probability model (LPM).
- Model 2 shows the estimates using a logistic regression
- Model 3 includes the proportion of Shared Taxes using a logistic regression

Table 5 Estimates for linear, logistic regression and fixed effect models (1–7)

Variables	(1) MPL	(2) Logit	(3) Logit	(4) Logit	(5) Logit	(6) Logit	(7) FE
Functional pressures							
Lag budget deficit	0.268*	2.221*	2.272**	2.205*	2.111*	1.813	3.005**
	(0.144)	(1.159)	(1.056)	(1.215)	(1.082)	(1.342)	(1.350)
Lag stock of debt	0.000	0.000	0.000*	0.000	0.000*	0.000	−0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Output gap (%)	−0.307	−2.829	−0.438	−0.524	−0.975	−2.337	−4.377
	(0.423)	(3.877)	(3.909)	(3.894)	(4.042)	(4.327)	(4.851)
Political pressures							
Ideology (Left-Wing = 1)	0.094***	0.872***	0.990***	0.987***	1.047***	0.763**	0.907*
	(0.028)	(0.322)	(0.340)	(0.341)	(0.359)	(0.335)	(0.486)
Regional coalition	0.052	0.445*	0.499*	0.477*	0.513*	0.476	1.183**
	(0.031)	(0.259)	(0.275)	(0.277)	(0.271)	(0.297)	(0.534)
Distance from an election year (in years) = 1	0.043	0.542	0.840*	0.851*	0.847*	0.680	0.605
	(0.038)	(0.467)	(0.433)	(0.435)	(0.440)	(0.484)	(0.459)
Distance from an election year (in years) = 2	0.051*	0.588*	0.864***	0.874***	0.854***	0.890**	0.651
	(0.026)	(0.304)	(0.322)	(0.321)	(0.326)	(0.415)	(0.456)
Distance from an election year (in years) = 3	0.130***	1.165***	1.265***	1.264***	1.266***	1.187***	1.190***
	(0.033)	(0.359)	(0.372)	(0.377)	(0.377)	(0.393)	(0.432)

(continued)

Table 5 Continued

Variables	(1) MPL	(2) Logit	(3) Logit	(4) Logit	(5) Logit	(6) Logit	(7) FE
Competitiveness of an election (%)	0.001	0.009	0.006	0.006	0.005	0.000	0.008
	(0.002)	(0.018)	(0.019)	(0.018)	(0.019)	(0.026)	(0.023)
Contextual pressures							
Dif. Effect (proportion of neighboring regions)	0.109*	0.810*	0.744	0.667	0.764	0.595	0.992
	(0.062)	(0.477)	(0.576)	(0.559)	(0.584)	(0.545)	(0.629)
Number of years that a tax was not imposed	0.005*	0.049**	0.062***	0.054**	0.065***	0.050*	0.115***
	(0.003)	(0.024)	(0.023)	(0.024)	(0.025)	(0.028)	(0.037)
Functional pressures: territorial financing system							
Ceded taxes per capita			−0.000*				
			(0.000)				
Transfers per capita				−0.000			
				(0.000)			
Total resources per capita					−0.000		
					(0.000)		
European funding per capita						0.001	
						(0.002)	
Constant	−0.051	−3.767***	−3.745***	−3.827***	−3.586***	−3.783***	
	(0.051)	(0.739)	(0.771)	(0.774)	(0.794)	(0.980)	
Observations	480	480	450	450	450	361	480

Robust standard errors in parentheses.
***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

- Model 4 considers the transfers from central government using a logistic regression
- Model 5 includes the total resources using a logistic regression
- Model 6 includes the EU transfers using a logistic regression
- Model 7 shows the estimates for a fixed effects logit panel data model.

All Models

We first run all the models (the linear probability model (Model 1), the logit models (Models 2–6), and the fixed effect model (Model 7) to estimate which variables have a significant effect on tax innovation. Results for the analysis using "count" models are reported in the last column of the table in Supplementary Appendix A2. The results are the same.

Budget deficit has a positive coefficient in all models, at a 90 percent level of significance. For every one unit increase in the variable *budget deficit*, the log odds of tax innovation increase by 2.2. So, the poorer the fiscal health of an AC, the more likely it is to adopt a new tax. Interestingly, the availability of other sources of revenue from central government transfers and ceded taxes does not depress the willingness of ACs to introduce new taxes (Models 3–5). If they face a budget deficit, they will raise revenue with whatever means available. However, when the variable *European Funding* is included, the effect of the budget deficit loses significance. This suggests that such funds help close a deficit gap that obviates the need for new taxes. But we think this relationship is spurious: European funds are allocated on a seven-year basis, so are unlikely to help an AC shore up its short-term budgetary position.

We find that *political pressures* are significant: the presence of a left-wing party in a regional government increases the probability of tax innovation in all the models (it increases the log-odds by at least 0.9). This is consistent with what we know from individual ACs: Madrid introduced only two taxes in twenty-five years under a PP government, while Aragon or Asturias introduced all possible taxes under PSOE governments. The presence of a *regionalist coalition* is also significant and positive (6 percentage points and 15 percentage points for the fixed effect model) in all the models, except for the estimates for LPM. Coalition governments which include regionalist parties is a long-standing trend in many ACs: e.g., Catalonia, Aragon, and Canary Islands are usually governed by coalition governments that include regionalist parties and are among the ACs with the highest tax innovation rate. The *electoral cycle* matters too as proximity to an election has a negative effect on tax innovation: being two and three years away from the next election increases the probability by 6 and 13 percentage points, respectively compared to an electoral year. There is no difference between an

election that is a year away and one that is the election year itself: there is a reduced tendency to introduce a tax.

Among *contextual pressures*, time dependence is positive and significant: the amount of time that has passed without the introduction of a tax increases the probability of a decision to introduce a tax in the current period. For a one unit increase in the variable, the log odds of creating a tax increases by 0.9. In contrast, we find only modest support for the diffusion effect in Model 2. The significance of this variable disappears when we include the variables relating to territorial financing (Models 3–6), suggesting that ACs pay more attention to their own revenue flows than to a neighbor's taxation policy.

In Models 2–6, the following variables were found to be insignificant: *stocks of debt, economic growth*, and *the competitiveness of elections*. We deduce that the stocks of debt have a negligible effect because they would have been low or nonexistent, given that ACs received their bulk of their funding from central transfers and would not have access to credit markets. Meanwhile, the effect of economic growth is only significant for fiscal health if it results in higher alternative forms of revenues. Finally, it is possible that a strategic considerations like competitiveness are less important in governmental systems in which coalition governments are the norm.

Predicted Probabilities

To better understand the results, we calculate the predicted probabilities of tax innovation, for the independent variables found to be significant in the previous analysis.[11] We calculate the likelihood of a tax being introduced for a particular independent variable, holding other variables at their mean.

First, we calculate the probability of tax innovation for certain levels of *budget deficit*, given differences in partisan *ideology*. An AC with poor fiscal health (90th percentile) has a probability of 0.16 of introducing a new tax, while an AC with a good fiscal health has a probability of 0.10.[12] If we isolate the effect of the *party ideology*, the probability of tax innovation is greater if a left-wing party is in government rather than a right-wing party (0.2 versus 0.08, a difference of 12 percentage points). But, if budget deficit and party ideology are combined, we find that there is a difference of 15 percentage points. Similarly, we find that there is a difference of 10 percentage points, in the probability of introducing a new tax between an AC government that includes a regionalist party and an AC governed by a right-wing party. Figure 3 shows this: the deterioration of an AC government's fiscal health enhances the effect of party ideology as it strengthens the willingness of left-wing and regionalist parties to introduce new taxes.

Second, we examine the effect of party *ideology* according to the strategic incentives created by the *electoral cycle*. As mentioned above, the probability of tax

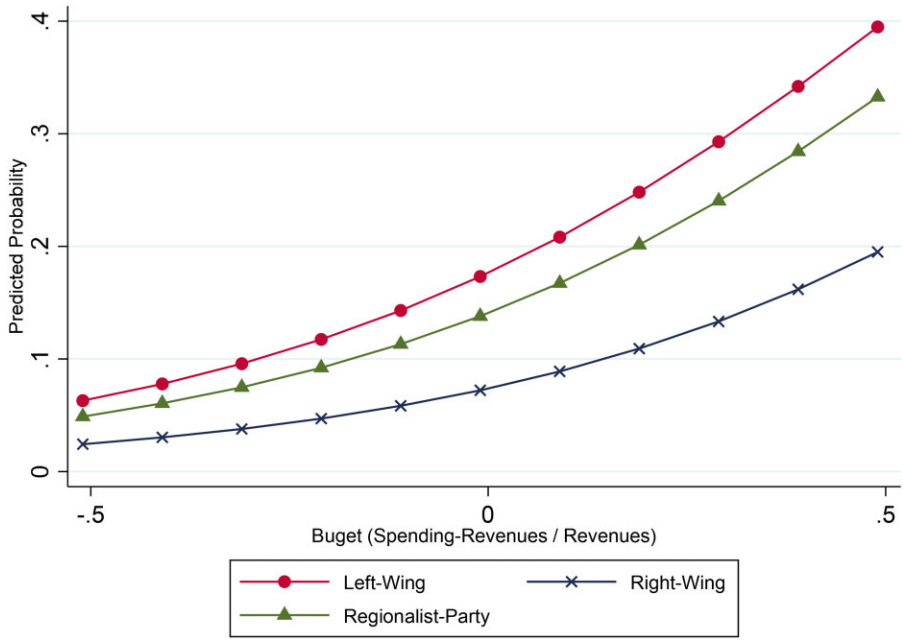

Figure 3 Predicted probability tax innovation for different levels of budgetary deficits, by party ideology.

innovation is raised by 12 percentage points as the distance to the next election increases to 3 years. This difference in probability increases to 19 percentage points if we observe a left-wing party in the regional government and decreases to 10 percentage points if this political party is right-wing. If a regionalist party is included in the cabinet, the difference is 16 percentage points in comparison with 11 percentage points, if there is no such party government. Figure 4 shows that while the electoral calendar influences the timing of tax innovation across all shades of parties, left-wing and regionalist parties are far more sensitive to this consideration. This reflect the fact that because right-wing parties are more reticent to introduce new taxes, they are more oblivious to the proximity of the next election. Left-wing and regionalist parties are more willing to introduce such measures as part of a broader progressive or region-building programme, but they are likely to do so immediately after winning regional office.

When looking at the effect of *temporal dependence*, we found that the probability of introducing a new tax increases by 6 percentage points for every one-unit change in the independent variable. However, this effect also varies according to party ideology, as shown in Figure 5 below. A left-wing party that is in power in a regional government where a tax has not been imposed in the three

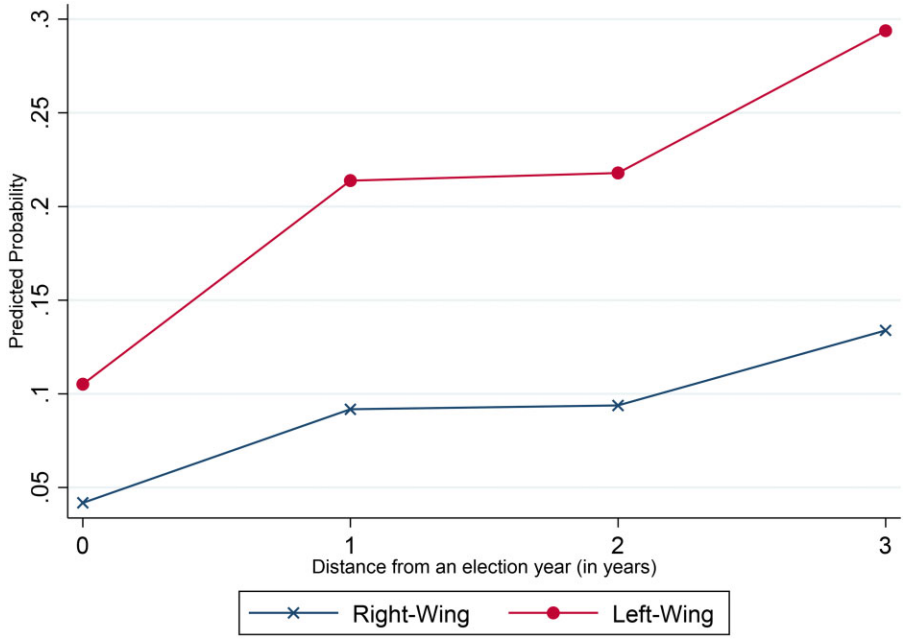

Figure 4 Predicted probability of tax innovation as time to next election increases, by party ideology.

previous years (median of the variable), has a probability of setting a tax of 0.18 while if the government has a right-wing ideology the probability is 0.08. Again, the difference between left-wing and right-wing parties' inclination to introduce taxes is maintained, but left-wing parties are also more wary of introducing them in too quick a succession.

Analysis by Time-Period

The puzzling result of our analysis is the absence of effects from the variables associated with the territorial financing system. One possible reason is that our analyses overlook the differences in the level of taxation autonomy that exist between time periods. To overcome this limitation, we divide the dataset into two: the observations from 1986 to 2000 and those from 2001 to 2018. The choice of the cut-off period was made in light of the significance of the territorial financing reform of 2001, which gave ACs the ability to raise a significant share of their revenues from 'ceded' taxes. We expect that this reform will depress the incentive to introduce 'own' taxes.

The results presented in Supplementary Appendix A1 reveal that this expectation is not met: the effect of "ceded" taxes, central transfers, and total

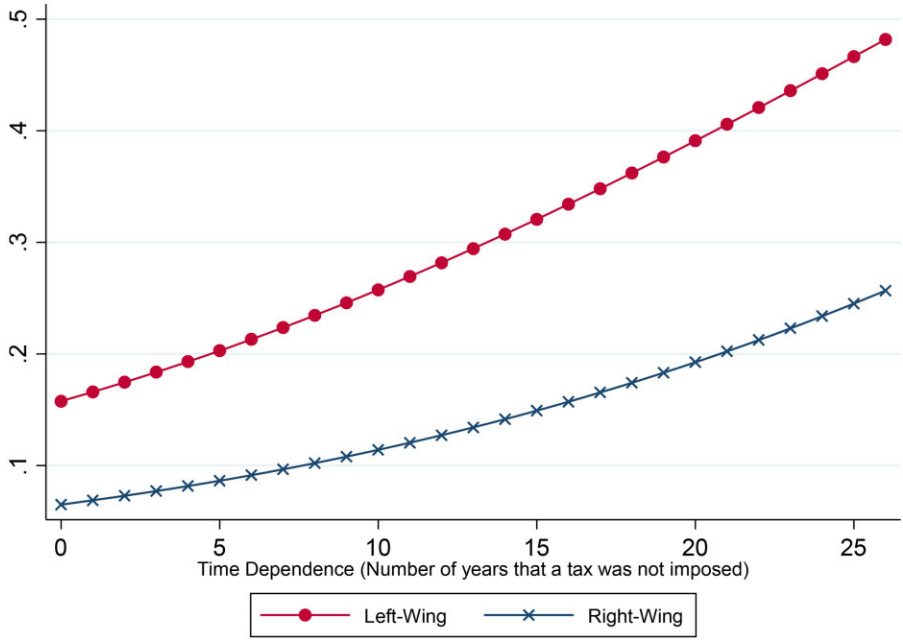

Figure 5 Predicted probability of tax innovation, as number of years with no prior tax increases, by party ideology.

available resources on tax innovation are weak and insignificant across both time periods. This provides further evidence that alternative revenues will not influence tax innovation. The main difference between the periods is that the *budget deficit* has a positive and significant effect on tax innovation in 1986–2001, while for the second time period, this effect disappears. This result is counter-intuitive because we expect budget deficits to be more consequential after the reform of 2001 which, by conferring greater taxation autonomy, may have led to funding shortfalls. The absence of such an effect may be explained by the fact that economic growth ("*output gap*") had a significant and negative effect on taxation innovation in this second period. Thus, the incentive to introduce new taxes was depressed by the absence of a budget deficit, which resulted from the effect of economic growth on alternative revenue sources.

Analysis by Type of Tax

In this section, we disaggregate the dataset into the types of taxes that we identify in table 2. The purpose is to evaluate how the determinants of tax innovation vary across different types and to establish points of confluence in the fiscal federalism and regulatory federalism. In addition, we wish to probe further the potential effect

of *geographical context* on taxation innovation. We therefore run the same models, but introduce activity, property, and environmental taxes as the dependent variables. The results are reported in Supplementary Appendix A2. One important result, common to all types of taxes, is that geographical context is not significant: policy diffusion through the mimicry of neighbors' policies is thus not a feature of taxation policy among Spanish regions.

(i) *Activity taxes:* are taxes on certain activities such as gambling or hunting, and, most importantly, given the value of this sector, tourism. The independent variables associated with innovation in this type of tax are: *budget deficit*, *electoral cycle*, and *time dependence*. The effect for *stock of debt* is also positive and significant but is weak. Similarly, *ceded taxes* and *total resources* have a negative and significant, but very weak effect. Meanwhile, *ideology* and *regionalist coalition* do not have an effect at all. It therefore appears that this type of tax is introduced by parties of all stripes, after being elected, in order to tackle a budget shortfall, if no such tax has been introduced previously. Taxes on tourism are ripe for such priorities given the ubiquity of this sector across Spanish regions and the potentially large source of revenue it presents.

(ii) *Property taxes*: are levied against different forms of capital such as land and bank deposits, and on large commercial establishments. The strongest and most significant effect is found for the *ideology* variable, revealing that the introduction of this type of tax is sensitive to the programmatic orientation of the party in office. Only two out of 17 tax innovations for property taxes were introduced by PP governments, the rest were introduced by a left-wing party. For example, the PSOE government of Extremadura introduced a tax on bank deposits (2006) followed by PSOE governments in Andalucia (2010) and Asturias (2012). In addition, the *election cycle* variable is significant revealing that, since these taxes are likely to be visible and politicized, their introduction is timed carefully, and only likely as soon as a left-wing party enters office.

(iii) *Environmental taxes* are levied on the use and management of water, the emission and disposal of pollutants such as waste, gas emissions, and plastic bags. The introduction of environmental taxes does not therefore respond to *budget deficit*. Among the functional pressures, the *stock of debt* and *percentage output gap* are significant determinants. But there is no basis for explaining this as environmental taxes are not designed to raise revenue. What is significant is that AC governments that include *regionalist coalitions* are more likely to introduce new taxes. During the early 2000s, there was an increasing use of taxation powers among ACs for new environmental taxes mainly because of changes in EU regulations aimed at improving the ambient air and water quality. At this time, ACs had to issue waste disposal plans, to conform with EU and national environmental law. Thus, there was an increase in the number

of ACs imposing taxes on waste water (Aragon (2001), Cantabria (2002), Murcia (2000), La Rioja (2000)); waste disposal (Cantabria (2002), Madrid (2003) and Murcia (2005) and Cataluña (2008)); waste discharge by coastal waters (Andalucia (2003) and Murcia(2005)); air pollution (Andalucia (2003), Aragon (2007), Murcia (2005)). The purpose of these taxes was to induce more environmental protection and new taxes were adopted according to very specific geographical and socioeconomic aspects of each AC.

Conclusion

This article took up the suggestion of Rodden and Wibbels (2002) to shed light on one of the blind-spots of the SGT of fiscal federalism—understanding what political factors shape the fiscal behavior of constituent units—by examining tax innovation among the "own" taxes of Spain's *Common Regime* ACs.

The article's main conclusion is that taxation policy is indeed shaped by politics. It provided evidence in support of the partisan model by showing that parties follow their programmatic commitments when introducing new taxes. Functional pressures are also important, as AC governments that faced budgetary deficits were more likely to introduce new taxes. But partisanship mediated these constraints: when faced with budgetary deficits, regional governments composed of left-wing parties or regionalist parties were more likely to introduce taxes than right-wing parties. This suggests that "own" taxes are used as instruments to satisfy revenue-raising and redistributive goals. We found further evidence of the effect of partisanship when we evaluated the incidence of innovation across different types of taxes. Property taxes, which are more clearly redistributive since they affect individuals' main financial asset, were more likely to be levied by left-wing parties. Our main conclusion was reinforced by evidence supporting the electoral cycle model and the effect of contextual pressures: ACs governed by left-wing parties were more sensitive to the incentives created by the timing of elections and the temporal context than ACs governed by right-wing parties.

Our investigation also allowed us to verify the central claim of the SGT of fiscal federalism about the benefits of taxation autonomy and "strong" budget constraints. When probing the influence of territorial financing system, we did not find an effect. This result persisted even after disaggregating the data into two time-periods separated by a significant reform to the territorial financing system. A lower dependence on central government transfers did not result in more innovation, nor did greater revenues through "partially ceded" taxes depress tax innovation. This puzzling finding calls for further investigation into how the different revenue streams of constituent units tend to interact, in particular in decentralizing system comparable to Spain such as Italy, Belgium, or the UK. But the implications with regards to the central claims of SGT are clear: if there is variation in the fiscal behavior of

constituent units due to political considerations rather than due to the incentives created by a territorial financing system, then it is difficult to arrive at an unequivocal conclusion about the inherent "pathologies" of that system.

This article also worked towards bridging the sub-field of fiscal federalism and regulatory federalism. It did so by demonstrating that "own taxes" serve multiple purposes from raising revenue, to regulating firm and consumer activity. It also revealed the variety of factors that influence the deployment of different types of taxes: the taxation of activity such as tourism was driven by functional pressures and revenue-raising objectives, while the taxation of property and the environment by political pressures. The presence of a regionalist party in the regional government increased the likelihood of regulatory environmental taxes, which are conceived as welfare-maximizing regulatory levies for the regional community. One consistent finding across all types of taxes concerned the weak effect of geographical diffusion. Research in regulatory and fiscal federalism have been brought together in the study of inter-jurisdictional competition in the United States and the anticipation this would generate "race to the bottom" in taxes and spending, and in labor and environmental standards. In the case of Spain, this anticipation is unfounded, as AC governments were motivated by their internal considerations.

Supplementary Data

Supplementary data are available at *Publius: The Journal of Federalism* online.

Notes

This research was funded with the support of the British Academy/Leverhulme Trust Small Grants (GS119085).

1. We focus on the economic and political determinants that increase the probability of tax innovation, but we do not study the revenue capacity of taxation innovation itself
2. Within the *Foral* regime, the provinces of the Basque Country and the AC Navarra have the power to establish and regulate their tax systems, including the ability to collect, manage and inspect all taxes with the exception of import duties and the value added tax. Both ACs transfer to the central government the resources agreed for the management of those competences that the ACs did not assume. Neither of them participate in the state-wide equalisation programs.
3. Expenditure for fundamental public services is calculated through a set of indicators that reflect cost factors related to the provision of these services: population protected by the public health system according to age groups 38 percent; population 30 percent; population in school age (0–16) 20.5 percent; population over 65 years 8.5 percent; surface area 1.8 percent; population density 0.6 percent; insularity 0.6 percent.
4. This includes Property Transfer and Stamp Tax (Impuesto sobre Transmisiones Patrimoniales y Actos Jurídicos Documentados), Inheritance and Gift Tax (Impuesto sobre Sucesiones y Donaciones), Special Tax on Certain Means of Transport (Impuesto

Especial sobre Determinados Medios de Transporte), Taxes on Gambling, taxes (Tributos sobre el Juego), Special Tax on Hydrocarbons (Impuesto Especial sobre Hidrocarburos) and Tax on Electricity (Impuesto sobre la Electricidad).

5. The establishment of "own" taxes has given rise to a high level of jurisdictional conflict, with frequent appeals to the Constitutional Court and the European Court of Justice For example the European Commission raised questions about the legality of the tax on large commercial establishments, considering that the exemption granted to small businesses constituted state-aid incompatible with EU law. Moreover, in 2002, the Tax on Retail Sales of Certain Hydrocarbons, was introduced with the objective of funding the ACs' budget for health-care and environmental expenses. Thirteen ACs had a sales tax on hydrocarbons in 2012. But in 2014 (Case C-82/12), the European Court of Justice ruled that this tax does not have a specific purpose and has a purely budgetary objective. (López Pérez, 2018).
6. This problem became particularly acute in 2011, during which a constitutional reform took place in which a balanced budget amendment and debt brake was added to Article 135. The Organic Law on Budgetary Stability and Financial Sustainability (amended in April 2012) develops Article 135 stating that all levels of the Spanish Public Administration must present a balanced or surplus budget. None may incur a structural deficit and a penalty system has been installed.
7. We start in 1986 because prior to that date ACs were still being established (up until 1983). Moreover, not all ACs received income from the central government. In addition, comparable data for fiscal information, spending and revenues, for the years prior to 1986 is more difficult to find.
8. For the year 2018, we use Ministry of Finance data, "Ejecución Presupuestaria a diciembre 2018"
9. For the period 1990–1993, we used data published in BBVA (1999) and for 1986–1990 period, we use data published in BBVA (1993). For these years the debt is calculated in pesetas. We considered an Exchange of 1 euro= 166,386 pesetas for the transformation.
10. Linear Probability Models can be used instead, but they do not guarantee that the fitted values will be in the $\lfloor 0,1 \rfloor$ interval. However, we include the results of the estimations for this model.
11. For these calculations we consider Model 2. The percentage of correctly classified observations for this model is 64 percent and the test Hosmer—Lemeshow suggests that there is no misspecification in the model.
12. This calculation considers that the rest of the variables are at their average values, although the average of a dummy variable does not represent a real situation, this calculation reflects an approximation to the direction of the influence of the budget deficit.

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