Public Choice (2013) 156:443–465
DOI 10.1007/s11127-012-0026-x

Ideology and the size of US state government

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Received: 2 May 2012 / Accepted: 27 September 2012 / Published online: 17 October 2012
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Abstract This paper theorizes that the impact of ideology on the size of US state governments increases with state income. This idea is tested using state-level ideology data derived from the voting behavior of state congressional representatives. Empirically the interaction of ideology and mean income is a key determinant of state government size. At 1960s levels of income the impact of ideology is negligible. At 1997 levels of income a one standard-deviation move towards the left of the ideology spectrum increases state government size by about half a standard deviation. Estimated income elasticities differentiated by state and time are found to be increasing with ideology and diminishing with income, as predicted by the theory.

Keywords Ideology · Wagner's law · Size of government

JEL Classification D72 · H10

1 Introduction

The average size of US state governments, measured as the share of total state tax revenue out of state-level income, increased from 3.05 % in 1950 to 5.68 % in 1997. By then, it varied from 2.15 % in New Hampshire to 8.14 % in Minnesota. This paper finds that differences in ideology, living standards, and crucially their interaction explain to an important extent both the growth and variation in state government size. Pickering and Rockey (2011) propose and find that differences in the growth of government observed in OECD countries since the Second World War can be explained by differences in ideology and in particular

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the interaction of ideology with income. Ideology is defined as tastes for public services or indeed altruistic redistribution relative to private consumption. When private consumption is a necessity then at low levels of income the median voter, even when left-leaning, will not tolerate reductions in private consumption induced by higher taxation and ideological differences do not lead to differences in the size of government. However as income levels increase the utility sacrifice from taxation in terms of lost private consumption falls faster than the utility gain from increased provision of public services, and only then do ideological differences manifest themselves in terms of government size. Using median voter ideology data derived from policy platforms Pickering and Rockey find that the interaction of government ideology with income empirically explains much of the growth and divergence in government size observed in the OECD sample.[1]

This paper takes the same hypothesis to US state level data. There are three reasons why US state level data represent an improvement over that analyzed previously. Firstly and most importantly, as Besley and Case (2003) observe, the common broad institutional and constitutional setting rules out many potential sources of unobserved heterogeneity, a real concern in the international context. Secondly there are more than twice as many states as there are countries in the OECD sample; hence more observations are available. Third, as detailed below the ideology data may be better measured.

Moreover the basic descriptive statistics seem to fit the story. The size of state government has tended to increase, and as with the OECD sample it is also the case that this growth has been far from uniform. Between 1950 and the end of the twentieth century, government, as measured by tax receipts as a share of state GDP, grew by 5 % in Minnesota, and actually shrank in Louisiana (by 0.19 %) and Wyoming (by 0.24 %).[2] A general upward trend, together with greater dispersion thus characterize the US state level data as they do in the OECD sample.

At a fundamental level there is an absence of consensus in the academic literature over the causes of these outcomes. The mechanism examined in this paper is that of citizen tastes, or ideology. A minimum requirement of a democracy is that government activities reflect voter preferences. But this is not the only candidate mechanism—Wagner's (1893) law predicts increasing government size with income. Baumol (1967) highlights cost disease, and the political economy and public choice literatures emphasize institutions and rent-seeking public servants. Quantifying the extent to which ideology explains government size represents an important research agenda. In related work, Bjørnskov and Potrafke (2011) also study the role of ideology in US politics; however, their hypothesis is distinct from ours. They provide evidence for an unconditional relationship between the 'size and scope of government'—a composite measure of the role of the state in the economy—and state ideology in a panel covering the period 1981–2005.[3]

[1] An extensive literature argues that differences in political culture, expressed in the form of differing political ideologies, play a role in determining the size and scope of government in mixed economies. Acemoglu (2005) makes this point in his critique of Persson and Tabellini (2003, 2004). Using international data Cameron (1978), Cusack (1997) and Tavits (2004) all find a relationship between government size and ideology using fixed ideological data (i.e., defined by parties in power). Pickering and Rockey (2011) found this relationship to be strongly conditional on income levels.

[2] In the context of US states there is an important distinction between tax revenue and public sector expenditure, as the latter is funded in part by transfers from the Federal government. This issue is addressed below.

[3] In common with this paper and Besley and Case (2003), Bjørnskov and Potrafke also emphasize the importance of divided government, as discussed below.

Besley and Case (2003) examine the determinants of US state level policy and summarize that "the early literature finds little evidence that party control matters" (2003:38).[4] Party control may be a weak determinant of government size for a number of different reasons: for example, in many southern states the Democrats historically have dominated politics, but may not have been ideologically comparable with their party colleagues in the North. Nonetheless, it is interesting that "recent work finds support for party control" (2003:39), including the regressions reported by Besley and Case themselves.[5] The apparent late ignition of the effect is consonant with the mechanism proposed by Pickering and Rockey given that income levels have risen over time.

However as has already been observed party identity is an imperfect measure of ideology due to heterogeneity in the stances taken by the same party in different states, or even by the same party in the same state at different points in time (see also Erikson et al. 1989). To address this issue, Besley and Case (2003) employ ideology data provided by Berry et al. (1998)—which have been widely used in the analysis of state-level policies.[6] These data are compiled from the observed voting patterns of states' congressional delegations and, hence, at least are based on comparable actions taken by politicians. In contrast, the Budge et al. (2001) data used in Pickering and Rockey (2011) are compiled from a textual analysis of policy platforms.[7] The latter require stronger assumptions regarding comparability, not least in that the focus is on words (furthermore written in many different languages) rather than deeds, and have been criticized in the instances of Italy (Pelizzo 2003) and Denmark (Hansen 2008). These data have also been found to exhibit weak convergent validity in the form of inconsistencies relative to expert surveys (Benoit and Laver 2007). In contrast Berry et al. (1998, 2010) report strong convergent validity of their measures with other indicators.

The empirical analysis employs the same set of controls, including institutional variables as well as state (fixed) and time effects following Besley and Case (2003). Furthermore, given the substantial persistence in government size the econometric specification is augmented by including the lagged dependent variable. The results show that the impact of ideology on the size of the US state government is strongly conditioned by state income levels. At 1960s levels of income, the impact of ideology is negligible, whilst at 1997 levels of income we find that a one standard-deviation move towards the liberal end of the ideology spectrum results in an increase in state government size of about 0.6 % of state income. The standard deviation of state government size is about 1.2 %; hence, ideology explains a sizable portion of the observed differences at 1997 levels of income. The results therefore support the previous evidence from the OECD sample.

[4] In particular Winters (1976), Dye (1984), Garand (1988) and Gilligan and Matsusaka (1995) all find little evidence that the identity of the party in control (i.e., whether Democrat or Republican) determines the overall level of spending.

[5] The relevant results in Besley and Case (2003:41, 43) are in their Tables 8 and 9. Knight (2000) also finds that Democrat (Republican) control of both houses leads to higher (lower) taxes rates relative to state GDP, Besley and Case (1995) find that Democrats raise taxes and spending when working under term limits and Rogers and Rogers (2000) also find that Democrat control in the house is associated with larger government. Blais et al. (1993) find that party identity plays a small role in driving government spending using international data.

[6] As Berry et al. (2010) note, Soss et al. (2001), Shipan and Volden (2006), Wood and Theobald (2003), Langer and Brace (2005), Songer and Ginn (2002) and Kim and Gerber (2005) all have used these data as determinants of state-level policy.

[7] In this paper we prefer the term 'policy platform', but the wider literature often prefers 'manifesto'. For our purposes, the terms are equivalent.

To head off any potential concerns that the causal relationship of interest is not as we claim, we also estimate state-time specific income elasticities of state taxation and regress these on state-time ideology and income per capita. The results are exactly in line with the theory. Income elasticity is found to be increasing with (leftist) ideology and decreasing with income.

The next section revisits the Pickering and Rockey (2011) hypothesis formally and Sect. 3 presents the empirical analysis. Section 4 concludes.

2 Ideology and the growth of government

In the seminal paper of Meltzer and Richard (1981) voters derive utility from consumption and the median voter mandates redistribution because the income distribution is right-skewed. The tax rate is set below 100 % because the median voter rationally anticipates the disincentive effect of higher taxes and the key insight is that greater inequality in the before-tax income distribution leads to a larger government. Pickering and Rockey (2011) extend this analysis by arguing that public services are distinct in how they affect the utility of voters and represent the government as providing a public-sector good in addition to pure redistribution.[8] Ideology is defined by preferences for the public good relative to private consumption. One possible justification is that services like education, health, defense and law and order may be underprovided by private markets, and should enter the utility function separately precisely because they are distinct. Another is that citizens derive altruistic utility from redistribution (perhaps in kind).[9] Stronger (conversely, weaker) tastes for these services describe ideology that is left- (right-) wing. Notably, these services may be 'luxury goods' and exhibit income elasticity greater than one as in Wagner's (1893) law. Ultimately, whether tax revenues are modeled as pure redistribution, a distinct public good, or both, depends on the objectives of the researcher and, indeed, Pickering and Rockey (2011) model the government as providing both. In this paper, for simplicity, taxes finance public goods alone.

Formally, in any particular state the voter (i) has a utility function

$$u_i(c_i, g) = F(c_i) + \beta G(g),$$

where c_i is consumption, g is the public good and F and G adhere to the standard assumptions that $F' > 0$, $G' > 0$, $F'' < 0$ and $G'' < 0$. We also assume that $F'(0) = \infty$, but that $G'(0) \leq \infty$, i.e., the marginal utility of private consumption is very high at low levels of consumption, whilst the marginal utility of the public good may be bounded even at zero consumption levels. The parameter β defines the prevailing ideology in the state—with larger values denoting increasingly left-wing polities. Consumption is financed by disposable income, i.e.,

$$c_i = (1 - t)y_i,$$

where t is a uniformly applied tax rate and y_i is income of individual i. The budget is balanced, with

$$t\overline{y} = g,$$

[8] It is simplest to think of the public good as rival and excludable rather than a public good of the Samuelson variety.

[9] See also Alesina et al. (2001), Alesina and Angeletos (2005), Benabou (2008) and Piketty (1995).

where $\overline{y}$ is mean income; hence, g is shared out equally across the population.

Given the balanced budget and that all individuals in the population are modeled to have the same preferences, the median voter is decisive and thus chooses t^* such that

$$\beta \overline{y} G'(g) = y_m F'(c_m),$$

where y_m is median income.[10] Assuming that the distribution of income is constant and defining $m = \frac{\overline{y}}{y_m}$ (> 1) this can be rewritten as

$$\beta m G'(g) = F'(c_m). \tag{1}$$

This first order condition determines the tax rate which defines the size of government. Note first that

$$\frac{dt^*}{d\beta} = \frac{-mG'(g)}{[\beta m G''(g) + \frac{1}{m} F''(c_m)]\overline{y}} > 0. \tag{2}$$

In the general formulation a shift to the left (increase in β) increases the size of the government holding all else constant.

Equation (2) also makes clear that the impact of ideology on the size of government in general depends non-linearly on mean income.[11] However unless further restrictions are placed on F and G it is not possible to say whether this impact increases or decreases as income levels rise. Pickering and Rockey (2011) argue that consumption is a necessity. This is the dual of Wagner's law: if the services that the government provides are a luxury good, in that the income elasticity of demand is greater than unity, then in a two-good world private consumption must be a necessity. A simple way to make this operational is the Stone-Geary utility function

$$u_i(c_i, g) = \ln(c_i - \mu) + \beta \ln(g + \mu),$$

where μ is the minimum level of consumption required for survival.[12] This utility function results in

$$t^* = \frac{\beta}{1+\beta} - \frac{(1+\beta m)\mu}{(1+\beta)\overline{y}}, \tag{3}$$

with the size of government converging on some ideal level $\frac{\beta}{1+\beta}$ as income levels increase (it is assumed that $\overline{y}$ is sufficiently larger than essential consumption μ to guarantee $t > 0$). Given this utility function then it follows that,

$$\frac{\partial t^*}{\partial \beta} = \frac{\overline{y} - (m-1)\mu}{(1+\beta)^2 \overline{y}} > 0.$$

This simply restates the above finding that an increase in β increases the size of government. (The inequality requires that mean income sufficiently exceeds the level of subsistence—a condition clearly met in the post-war era United States.) Equation (3) also implies Wagner's law, that the relative state size will increase with mean income:

$$\frac{\partial t^*}{\partial \overline{y}} = \frac{(1+\beta m)\mu}{(1+\beta)\overline{y}^2} > 0. \tag{4}$$

[10] Note that given the properties of F and G the equilibrium is unique and bounded, i.e., $0 \leq t^* < 1$.

[11] As well as entering (2) directly, c_m and g also depend on $\overline{y}$, hence restrictions on the third-order derivatives are required.

[12] Meltzer and Richard (1983) also employ this functional form.

The Stone-Geary functional form also implies two additional results, firstly

$$\frac{\partial^2 t^*}{\partial \overline{y}^2} = -\frac{2(1+\beta m)\mu}{(1+\beta)y^3} < 0, \tag{5}$$

which means that the response of government size to income is diminishing as incomes rise. As income grows to infinity, as is clearly visible from (3), government size converges to the 'steady state' defined by $\frac{\beta}{1+\beta}$. As discussed in Pickering and Rockey (2011), once income levels reach the point at which the government 'takes off' public sector growth is at first quite rapid before slowing as the steady state is approached. Below we investigate how the income elasticity of the demand for government varies with the income level empirically.

Secondly,

$$\frac{\partial^2 t^*}{\partial \beta \partial \overline{y}} = \frac{(m-1)\mu}{(1+\beta)^2 \overline{y}^2} > 0, \tag{6}$$

which implies that Wagner's law depends on ideology. This is the main result in Pickering and Rockey (2011). The impact of ideology on the size of government increases as income levels rise. At low levels of income ideological differences may not manifest themselves in differences in government size whilst economic growth will bring about a divergence in government size across different ideologies. Pickering and Rockey (2011) find empirically that government size in the OECD countries conforms to this story. In the below empirical analysis we ask whether or not the same holds for the case of US state governments.

3 Empirical analysis

The data source for the dependent and control variables is Besley and Case (2003), who provide comprehensive state-level policy and institutional data for the years 1950–1997. Following their analysis our first measure of the size of the public sector is total taxes per capita divided by state income per capita.[13] Table 1 contains descriptive statistics for this variable in selected years. As discussed in the introduction, the data exhibit an upward trend on average and also greater dispersion over time. The trend has not been constant, with most of the increases occurring in the first half of the sample. These stylized facts are consistent with the theory outlined above.

In the context of US state governments, the size of the public sector is somewhat more nebulous than for national governments, for whom budgets (eventually) must balance. Grants and transfers from the federal center are a major source of state revenues; hence taxes alone understate public sector size at the state level. For this reason the analysis also uses state government expenditure divided by state income as an additional dependent variable. Table 1 contains descriptive statistics for this variable showing an upward trend over time as with the taxes data. However, total state expenditure is of course subject to Federal decision-making, in turn determined by processes that lie outside of the theoretical framework considered above. Given these considerations the appropriate measure of state government size is not clear a priori. Nonetheless, the real per capita tax revenue and state expenditure data are quite highly correlated with each other—the correlation coefficient is 0.88. It seems likely that both variables are good measures of state-level public sector size;

[13] Total taxes are defined as the sum of sales, income and corporate taxes. The data are described in full in Besley and Case (2003).

Table 1 Descriptive statistics for $\frac{t}{y}$, the ratio of total taxes to state income per capita, and $\frac{g}{y}$, the ratio of total spending to state income per capita

	mean	sd	min	max
1950				
$\frac{t}{y}$	3.047	0.987	0.960	5.344
$\frac{g}{y}$	6.901	2.007	2.989	12.591
1960				
$\frac{t}{y}$	3.852	1.099	1.423	6.354
$\frac{g}{y}$	8.227	2.400	3.179	15.010
1970				
$\frac{t}{y}$	5.172	1.107	2.492	7.602
$\frac{g}{y}$	10.955	2.586	6.532	16.737
1980				
$\frac{t}{y}$	5.381	1.054	2.450	7.436
$\frac{g}{y}$	11.430	2.240	7.979	16.278
1990				
$\frac{t}{y}$	5.695	1.126	1.957	7.716
$\frac{g}{y}$	11.921	2.452	7.474	19.351
Total				
$\frac{t}{y}$	4.629	1.471	0.960	7.716
$\frac{g}{y}$	9.887	3.048	2.989	19.351

Data are in percentage terms. Each year reported contains data for all 48 states

all the econometric specifications examined in this paper are therefore estimated using both variables. As will be seen, the results are robust using either variable.

The apparent slowdown in public sector expansion in the later years could also be explained by a general ideological movement to the right, i.e., greater antipathy towards public sector provision in the electorate at large. In support of this narrative, Smith (1990) analyzes 455 surveys on the liberal/conservative dimension and writes that "Liberal growth was strongest during the 1960s and early 1970s. In the mid-1970s, many liberal trends slowed, with some stopping their advance and a few reversing direction". The US-level ideological data for presidential elections generated from policy platform data by Kim and Fording (1998, 2003) also depict a rightward shift by both major parties in the 1980s.

State level ideology data are taken from Berry et al. (2010) (hereafter BFRHK), who revise and extend their original data (Berry et al. 1998), which were employed by Besley and Case (2003). BFRHK provide a measure of the median state-citizen ideology ($ideo_c$) and two series for state government ideology. The first of these measures uses Americans for Democratic Action (ADA) and Committee on Political Education (COPE) scores of congressional representatives and is denoted $ideo_{gADA/COPE}$. The second uses NOMINATE measures of state government ideology ($ideo_{gNOM}$), which rely on common space scores of Members of Congress. BFRHK find that the $ideo_{gNOM}$ measure marginally outperforms their original $ideo_{gADA/COPE}$ measure in terms of validity checks, although both measures are

Table 2 Descripitive statistics for $ideo_c$

	mean	sd	min	max
1960	0.504	0.198	0.062	0.857
1970	0.445	0.182	0.110	0.816
1980	0.424	0.160	0.153	0.772
1990	0.484	0.132	0.219	0.883
Total	0.464	0.171	0.062	0.883

Each year reported contains data for all 48 states

utilized here for the sake of robustness. The steps by which the congressional voting scores translate into state level measures of citizen and government ideology are described in full in Berry et al. (1998) and their sequel paper.

As noted in the introduction, the BFRHK data perform well in tests of convergent validity. Nonetheless, these data may still be imperfect measures of true ideology. In particular, the data are constructed from measures of the positions taken by congressional representatives rather than state-level politicians. For example, one key assumption (acknowledged by Berry et al. 1998) made in the construction of the state-level government ideology series is that state-level representatives of any particular party have the same ideology as Members of Congress from the same party and state. Berry et al. (1998) report strong correlations between their data and the limited available data that do directly measure state-level representatives' ideology.

In the theoretical model, the median voter defines policy, and Pickering and Rockey (2011) employ median voter data in their analysis. The BFRHK citizen ideology variable measures the average location of the active electorate in each state on a liberal-conservative dimension and is our preferred measure in the empirical work.[14] However, median voter models by construction abstract from the possibility that government policy may diverge from the median. For this reason and also the possibility of mismeasurement in the data, the analysis also includes the state government ideology measures.

Summary statistics of $ideo_c$ are presented in Table 2. Higher numbers represent greater 'liberalism' (i.e., increasingly left-wing ideology). The state mean exhibits a move towards the right in the 1970s and 1980s relative to the 1960s. There clearly also is considerable cross-sectional variation throughout the sample. Furthermore, the summary statistics disguise interesting state specific trends. The states of New England and California have tended to be relatively leftist throughout, whilst Southern states such as Louisiana and Oklahoma have on the whole consistently maintained a right-wing stance (though even in these examples there is some temporal variation). On the other hand, many Mountain states, such as Idaho, Wyoming and Montana, have to varying degrees drifted rightwards ideologically, whereas Southern Atlantic states, such as Delaware, North and South Carolina and Virginia, have drifted to the left over time. Berry et al. (1998, 2010) describe these data in more detail and argue strongly for temporal variation within states (hence criticizing fixed

[14]The liberal-conservative dimension links with the above theory wherein ideology is defined by preferences for the public good relative to private consumption. For example, Saunders (2004) writes that "A liberal… favors activist government and has a progressive vision of the state's role… through necessarily higher taxes" whilst "the conservative tends to oppose an activist government… (and) usually favors lower… taxes. Simply put a pure conservative believes in the least government possible at all levels."

Table 3 Correlation coefficients of the ideology and political representation data

	$ideo_c$	$ideo_{g,ADA/COPE}$	$ideo_{g,NOM}$	FDLH	FDUH
$ideo_c$	1				
$ideo_{g,ADA/COPE}$	0.662	1			
$ideo_{g,NOM}$	0.375	0.874	1		
FDLH	−0.208	0.203	0.430	1	
FDUH	−0.262	0.154	0.393	0.893	1

ideology measures) and also identify considerable heterogeneity across states in both levels and trends.

Table 3 shows that the ideology data are quite strongly correlated with one another, though not perfectly—there is at least some distinction between the ideology measures of the median voter and government positions. This table also reports correlation coefficients between the ideology data and the political representation data, in particular the fraction of Democrats in the lower and upper houses (respectively *FDLH* and *FDUH*), which are in general much lower. This provides further support for the argument that party representation in government is a weak measure of the prevailing ideology in a state at a point in time.

The starting point for the econometric analysis is a replication of column 1 of Table 9 in Besley and Case (2003).[15] This regression has total taxes per capita as the dependent variable rather than taxes as a proportion of income, and in the interests of ensuring comparability we begin by following suit. Following their analysis this benchmark specification includes both fixed and time effects and controls for the proportion of population aged 65 and above, the proportion of population aged 5 to 17, state income per capita in real terms, and state population.

There are also a number of other political variables included in this regression, namely *FDLH*, *FDUH*, an indicator variable for whether or not the governor is a Democrat (*DemGov*), an indicator variable for Democrat control of both houses (*DemBoth*) and also a measure of party competition (*PolComp*). Column 1 of Table 4 reports the results which are very close to the original. The only slight exceptions are that the estimated coefficient pertaining to ideology, whilst still exhibiting a positive sign, is no longer statistically significant. It is likely that revisions to the ideology data made by Berry et al. (2010) underpin this discrepancy. In column 2 of Table 4 the same regression model is estimated with two modifications: firstly, the extended ideology data are included and, secondly, the standard errors are estimated robustly and are clustered. Unfortunately under this specification none of the political variables are statistically significant.

However, the hypothesis under investigation concerns the size of government *relative to GDP*, i.e., total taxes divided by GDP. This is the dependent variable employed in Pickering and Rockey (2011); hence column 3 of Table 4 recasts the analysis using this alternative dependent variable. This time the relationship between ideology and state size is found to be negative, though again insignificant.

As noted above one potential source of bias in the Besley and Case (2003) specification could be fiscal transfers between the states via the Federal Government. It follows from the

[15] Note that because Berry et al. (2010) have since updated their ideology data, estimation is now feasible for the full sample whereas Besley and Case (2003), only had access to ideology data ending in 1993. The ideology data begin in 1960. Following Besley and Case (2003) Nebraska is omitted from the analysis because it has a unicameral non-partisan legislature.

Table 4 Econometric output—replicating Besley and Case

	(1) total taxes per capita	(2) total taxes per capita	(3) $\frac{t}{y}$	(4) $\frac{t}{y}$	(5) $\frac{g}{y}$
FDLH	48.002**	64.444	0.370	0.744	1.673**
	(22.268)	(56.328)	(0.441)	(0.445)	(0.806)
FDUH	41.662**	28.504	0.489	0.541	0.488
	(19.643)	(41.836)	(0.315)	(0.371)	(0.800)
demgov	−0.497	−4.842	−0.000	−0.019	−0.120
	(3.210)	(5.381)	(0.044)	(0.050)	(0.108)
demboth	5.451	8.079	0.055	0.030	0.024
	(5.690)	(10.417)	(0.085)	(0.072)	(0.162)
polcomp	89.554*	75.220	0.943	−1.233	−3.189
	(54.293)	(127.774)	(0.894)	(1.030)	(2.016)
$ideo_c$	18.256	4.885	−0.179	−0.670	−0.319
	(21.730)	(54.266)	(0.430)	(0.493)	(0.926)
transhare				0.546	1.539
				(0.677)	(1.390)
Years in sample	1960–1993	1960–1997	1960–1993	1960–1993	1960–1993
Number of observations	1583	1724	1583	1583	1583
Number of states	47	47	47	47	47
R^2 (within)	0.899	0.894	0.679	0.633	0.638

Standard errors in parentheses. $\frac{t}{y}$ is the ratio of total taxes to state income. $\frac{g}{y}$ is the ratio of total state expenditure to state income. *DemGov* is an indicator variable set equal to one when the governor is a Democrat. *Demboth* is an indicator variable set equal to one when the Democrats control both houses. *PolComp* is a measure of political competition that takes higher values when seat shares are more equal. Other controls include state income, state population, and the proportions of children and senior citizens. Citizen ideology, $ideo_c$ and percentage net transfers *transhare* are explained in the main text. All regressions contain year and state fixed effects

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

model of Sect. 2 that for any given level of income, positive net inter-state transfers and thus higher state government spending would imply that the median voter's preferred tax level will be lower.[16] It is also possible that these funds are not entirely fungible with those raised through taxation, and therefore the total net value of transfers received, *Transfers*, is added to BC's specification in column 4 of Table 4 but there is still little evidence for any political determinants of the size of government. Similarly column 5 of Table 4 reproduces column 4 using state expenditure as a share of state income as the dependent variable and again current ideology is shown to have little impact.[17]

The evidence therefore does not support a relationship between government size and *contemporaneous* ideology. In fact this resonates with Pickering and Rockey (2011), who

[16] This follows immediately from the state budget constraint.

[17] Besley and Case (2003) also used quadratic terms in income and state population but we have dropped these terms for two reasons. Firstly, they are highly collinear with the other variables. In particular the Variance Inflation Term (VIF) for state income is 180 when column 1 of Table 4 is extended to include the squared terms. Secondly, the theory is concerned with income elasticity and inferences are more straightforward when just the linear term is included.

Table 5 Using lagged ideology measures

	(1) $\overline{ideo}_c$	(2) $\overline{ideo}_{g,ADA/COPE}$	(3) $\overline{ideo}_{g,NOM}$
$\overline{ideo}_i$	0.006	0.287	1.007
	(0.881)	(0.368)	(0.858)
income	−0.047	−0.047	−0.048
	(0.098)	(0.099)	(0.100)
FDLH	0.672	0.626	0.598
	(0.458)	(0.467)	(0.464)
FDUH	0.378	0.403	0.391
	(0.369)	(0.365)	(0.363)
demgov	−0.041	−0.063	−0.077
	(0.050)	(0.052)	(0.052)
demboth	0.061	0.050	0.043
	(0.070)	(0.072)	(0.071)
polcomp	−1.623	−1.903*	−1.854*
	(1.225)	(1.000)	(0.950)
transhare	0.290	0.281	0.261
	(0.673)	(0.701)	(0.700)
Years in sample	1960–1997	1960–1997	1960–1997
Number of observations	1724	1724	1724
Number of states	47	47	47
R^2 (within)	0.615	0.616	0.618

Clustered robust standard errors in parentheses. $\overline{ideo}_i$ is the lag of average ideology as discussed in the main text. All other variables are as for Table 4. * $p < 0.10$

also found little evidence of a contemporaneous relationship in the OECD sample. Following their reasoning, an alternative line of attack is to posit a link between lagged ideology measures and current policy. In practice, bureaucratic inertia might mean that it takes time before the full impact of ideological shifts manifest themselves in policy changes. At any point in time government size is likely to be cumulatively a function of ideology in several past years rather than exactly mirroring the current zeitgeist. Following Pickering and Rockey (2011), we define $\overline{ideo}_i$ (where $i = c, gADA/COPE, gNOM$) as the moving average of ideology over the past 10 years of data. Taking the average of the past 10 years' data also alleviates concerns of endogeneity—the ideology measures now substantially predate the observations on government size.

In Table 5 estimation results are presented using the lagged ideology data.[18] In the first column the average of the previous 10 years of citizen ideology ($\overline{ideo}_c$) is used and the estimated relationship is now positive, though not statistically significant. Regressions using

[18] In Tables 5 and 6 results are reported using the tax share of state GDP as the dependent variable. The results and inference are not substantially altered when total state expenditure as a share of state GDP is used instead as the dependent variable.

Table 6 Introducing the interaction of ideology measures and income

	(1) $\overline{ideo}_c$	(2) $\overline{ideo}_{g,ADA/COPE}$	(3) $\overline{ideo}_{g,NOM}$
$\overline{ideo}_i$	−4.361***	−1.993**	−1.702
	(1.232)	(0.843)	(2.298)
$income \times \overline{ideo}_i$	0.497***	0.241***	0.246
	(0.118)	(0.075)	(0.182)
income	−0.366***	−0.212**	−0.194
	(0.085)	(0.086)	(0.124)
FDLH	0.057	0.329	0.491
	(0.458)	(0.470)	(0.467)
FDUH	0.255	0.552	0.477
	(0.352)	(0.346)	(0.354)
demgov	−0.041	−0.073	−0.067
	(0.046)	(0.052)	(0.054)
demboth	0.101	0.043	0.040
	(0.069)	(0.067)	(0.069)
polcomp	0.079	−1.107	−1.669*
	(1.055)	(0.979)	(0.933)
Years in sample	1960–1997	1960–1997	1960–1997
Number of observations	1724	1724	1724
Number of states	47	47	47
R^2 within	0.649	0.636	0.624

Clustered robust standard errors in parentheses. Other details are as for Table 4

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

lagged government ideology data (in columns 2 and 3) similarly reveal positive but insignificant effects. More generally these results show no direct effect of politics on state taxation—none of the political variables are significant. However, the central insight of Pickering and Rockey (2011) is that the impact of ideology on state size is conditional on income. Table 6 thus includes interaction effects. In column 1 ideology is measured using $\overline{ideo}_c$ and the estimated interaction effect ($income \times \overline{ideo}_c$) is positive and significant at the 1 % level. The impact of greater liberalism on state government size increases with income as predicted by the theory. The results for the measures of government ideology are similar using $\overline{ideo}_{gADA/COPE}$, though significance levels are lower in the case of $\overline{ideo}_{gNOM}$.

However, before developing the inference of these results the econometric specification is augmented to included the lagged dependent variable (LDV). There are (at least) two good reasons for including the LDV. Firstly total government size is a slowly moving variable, and omission of dynamics will lead to autocorrelated residuals and biased estimates of standard errors. Secondly the LDV helps to control for unobserved heterogeneity in that it contains information on any unobserved drivers of government size that are present in adjacent periods. This is also now equivalent to the specification of Pickering and Rockey (2011), and may be written as:

$$\left(\frac{t}{y}\right)_{it} = \alpha\left(\frac{t}{y}\right)_{it-1} + \beta y_{it} + \gamma\,\overline{ideo}_{c,it} + \delta(\overline{ideo}_c \times y)_{it} + x'_{it}\theta + \omega_i + \phi_t + \varepsilon_{it}. \quad (7)$$

Table 7 Including the lag of the dependent variable

	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)
	$\overline{ideo}_c$		$\overline{ideo}_{g,ADA/COPE}$		$\overline{ideo}_{g,NOM}$	
$(\frac{t}{y})_{it-1}$	0.767***		0.777***		0.783***	
	(0.034)		(0.035)		(0.034)	
$\overline{ideo}_i$	−0.763**	−3.281**	−0.439*	−1.967*	−0.475	−2.192
	(0.356)	(1.461)	(0.242)	(1.079)	(0.585)	(2.778)
income × $\overline{ideo}_i$	0.103***	0.443***	0.049**	0.220**	0.051	0.238
	(0.037)	(0.143)	(0.024)	(0.100)	(0.047)	(0.217)
income	−0.102***	−0.441***	−0.069**	−0.319***	−0.066*	−0.306**
	(0.035)	(0.110)	(0.030)	(0.102)	(0.033)	(0.123)
FDLH	0.043		0.115		0.146	
	(0.156)		(0.157)		(0.156)	
FDUH	0.019		0.071		0.055	
	(0.115)		(0.106)		(0.109)	
demgov	−0.000		−0.003		−0.000	
	(0.014)		(0.017)		(0.017)	
demboth	0.078**		0.067**		0.067**	
	(0.030)		(0.029)		(0.029)	
polcomp	0.150		0.050		−0.058	
	(0.336)		(0.313)		(0.297)	
Years in sample	1960–1997		1960–1997		1960–1997	
Number of observations	1724		1724		1724	
Number of states	47		47		47	
R^2 (within)	0.854		0.853		0.852	

Clustered robust standard errors in parentheses. Other details are as for Table 4

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Here, y_{it} is income per capita in state i in year t, α is the coefficient on the LDV, β the direct effect of state income per capita, γ the direct effect of $\overline{ideo}_c$ and δ the coefficient on their interaction. We denote using θ the vector of coefficients associated with *transfers* and the demographic and political controls employed by Besley and Case (2003) discussed above. State and year fixed effects are denoted ω_i and ϕ_t, respectively. Finally, we assume that $\varepsilon_{it} \sim N(0, \Sigma)$; Σ is estimated allowing for clustering at the state level.

Table 7 contains the estimation results, confirming firstly that government size is highly persistent. Columns 1a, 2a and 3a contain the estimated short-run (period p) impact of the explanatory variables and columns 1b, 2b and 3b present the corresponding long-run parameter estimates. In all three cases, and again mirroring the results found by Pickering and Rockey (2011) when examining the OECD sample, the 'direct' (or unconditional) impact of ideology is estimated to be negative, but the overall impact of ideology is positive once income levels are above a certain level. Column 1 contains the results using the (preferred) citizen ideology measure. Using these parameter estimates it is possible to run an experiment analogous to Pickering and Rockey (2011), who contrast government growth in archetypal left- and right-wing regimes, respectively defined by ideology one standard deviation higher and lower than the mean. Using the parameter estimates of column 1, then given representative state income growth from \$6,722 in 1960 to \$14,800 in 1997,

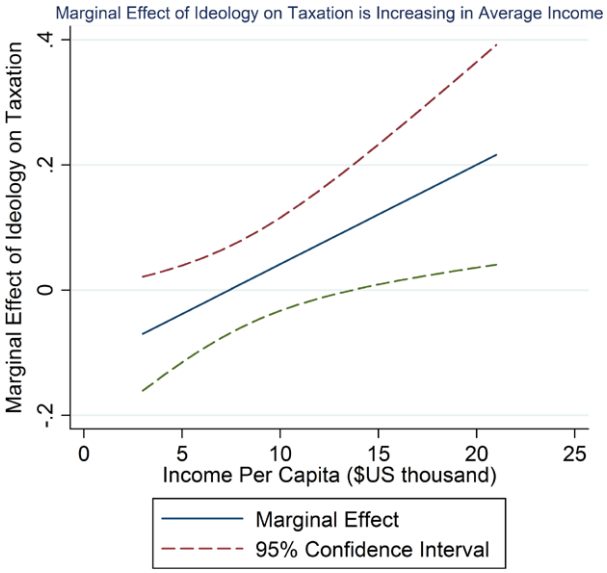


Fig. 1 Marginal effect of ideology on government taxation conditional on state income per capita

state-government growth is projected to be 1.25 % in the archetypal right-wing state as compared with 2.46 % in the archetypal left-wing state. The difference of 1.21 % may not seem large, but this represents around one standard deviation of the variation in state government size in 1997. The interaction of state-income and ideology thus explains a sizable fraction of observed differences in state government size.

The overall effect of ideology depends on its interaction term with income. Following Braumoeller (2004), Fig. 1 depicts how the overall effect of $\overline{ideo}_c$ changes with income. As predicted by the model, and similar to the findings of Pickering and Rockey (2011), the graph demonstrates that ideology has little empirical impact on government taxation until a minimum level of income—around $14,000—is attained.[19]

The results in Table 7 are if anything strengthened when public sector expenditure, $\frac{g}{y}$, is used instead as the measure of state government size. Table 8 presents the relevant results and shows that for all three ideology measures the significance of the interaction term is increased using the expenditure data, although broadly the inference is unchanged.[20]

One potential concern with the estimation results is that the dependent variable is non-stationary. The estimated coefficient on the autoregressive term is around 0.78; hence, there is clearly at least a strong degree of persistence. To test such concerns a battery of a panel unit root tests were performed. The most appropriate for the dataset at hand are that of Im et al. (2003) and Choi (2001); in both cases these suggest that we should reject the null hypothesis of integration. Conversely, Hadri's (2000) test rejects the alternative null hypothesis of stationarity. Although this test has been found to exhibit low power (cf. Hlouskova and Wagner 2006), the results of these tests are best considered inconclusive and to avoid doubt, we also estimate the first-difference analogue of (7) for both $\frac{t}{y}$ and $\frac{g}{y}$, i.e.,

$$\Delta\left(\frac{t}{y}\right)_{it} = \alpha\Delta\left(\frac{t}{y}\right)_{it-1} + \beta\Delta y_{it} + \gamma\Delta\overline{ideo}_{c,it} + \delta\Delta(\overline{ideo}_c \times y)_{it} + \Delta x'_{it}\theta + u_{it}, \quad (8)$$

[19] When state expenditure is the dependent variable, the impact of ideology becomes significant at $9,000.

[20] Note that the state expenditure data include observations from 1998, thus increasing the sample size by 47.

Table 8 Using state expenditures as the dependent variable

	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)
	$\overline{ideo}_c$		$\overline{ideo}_{ADA/COPE}$		$\overline{ideo}_{g,NOM}$	
$(\frac{g}{y})_{it-1}$	0.765***		0.781***		0.787***	
	(0.038)		(0.034)		(0.033)	
$\overline{ideo}_i$	−1.282*	−5.454**	−0.808*	−3.692**	−0.761	−3.568
	(0.670)	(2.519)	(0.461)	(1.936)	(1.028)	(4.765)
income × $\overline{ideo}_i$	0.260***	1.105***	0.116**	0.532**	0.148	0.692
	(0.084)	(0.273)	(0.050)	(0.201)	(0.093)	(0.418)
income	−0.293***	−1.246***	−0.197***	−0.899***	−0.203**	−0.952***
	(0.085)	(0.218)	(0.070)	(0.213)	(0.079)	(0.272)
FDLH	−0.045		0.168		0.222	
	(0.218)		(0.234)		(0.235)	
FDUH	0.092		0.247		0.211	
	(0.233)		(0.218)		(0.219)	
demgov	−0.025		−0.050		−0.046	
	(0.032)		(0.033)		(0.032)	
demboth	0.013		−0.027		−0.029	
	(0.048)		(0.053)		(0.053)	
polcomp	−0.099		−0.177		−0.328	
	(0.651)		(0.642)		(0.615)	
R^2	0.876		0.874		0.874	
N	1771		1771		1771	

$\frac{g}{y}$, the ratio of total state government expenditure to state income, is the dependent variable

Clustered robust standard errors in parentheses. Other details are as for Table 4

$^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$

where Δ is the difference operator and $u_{it} = \varepsilon_{it} - \varepsilon_{it-1}$. All other definitions are as for (7).[21] The results reported in Table 9 are qualitatively similar, albeit with less precision in some instances. Columns 1 and 3 report results using the specification in (8), using $\Delta(\frac{t}{y})$ and $\Delta(\frac{g}{y})$ as the dependent variable respectively. Columns 2 and 4 augment this specification with state and year effects to offer a more direct comparison with the specification of Bjørnskov and Potrafke (2011). The broad inference is unchanged: the interaction term is always positive although not significant in column 2. This is perhaps to be expected as the composite error term in Eq. (8) potentially has greater noise. However, encouragingly, the results for the same specification using $\Delta(\frac{g}{y})$ are significant at all conventional levels. Taken as a whole the results in Table 9 have the same qualitative interpretation as those in Tables 7 and 8, and further allay concerns that the results are due to non-stationarity.

A second potential source of concern is the Nickell (1981) bias associated with models involving fixed effects, sometimes termed Least Squares Dummy Variables (LSDV) models, and a lagged dependent variable. Whilst this is of the order $\frac{1}{T}$, and in our sample we

[21] This specification follows from (7), and is similar to that used by Bjørnskov and Potrafke (2011) with the distinction, following from the theory, that the difference in government size is regressed on the difference in ideology and its interaction with income, as opposed to ideology measured in levels.

Table 9 First difference estimates

	(1) $\Delta(\frac{t}{y})$	(2) $\Delta(\frac{t}{y})$	(3) $\Delta(\frac{g}{y})$	(4) $\Delta(\frac{g}{y})$
$\Delta(\frac{t}{y})_{it-1}$	−0.105***	−0.174***		
	(0.029)	(0.024)		
$\Delta(\frac{g}{y})_{it-1}$			−0.024	−0.140***
			(0.039)	(0.022)
$\Delta\overline{ideo}_c$	−3.227**	−1.521	−11.863***	−8.591***
	(1.284)	(1.419)	(3.268)	(2.429)
Δincome × $\overline{ideo}_c$	0.214*	0.161	1.067***	0.817***
	(0.118)	(0.137)	(0.324)	(0.233)
Δincome	−0.132	−0.434***	−0.940***	−1.371***
	(0.084)	(0.071)	(0.205)	(0.122)
ΔFDLH	0.220	0.205	0.122	0.429
	(0.153)	(0.163)	(0.320)	(0.280)
ΔFDUH	−0.195	−0.059	0.068	0.020
	(0.169)	(0.152)	(0.303)	(0.262)
Δdemgov	0.046*	0.041	0.047	0.017
	(0.024)	(0.026)	(0.047)	(0.044)
Δdemboth	−0.074	−0.065*	−0.054	−0.074
	(0.055)	(0.037)	(0.079)	(0.064)
Δpolcomp	0.992**	0.678	1.355	0.727
	(0.427)	(0.449)	(1.145)	(0.774)
State and Year Effects	No	Yes	No	Yes
R^2	0.044	0.260	0.091	0.392
N	1630	1630	1677	1677

Clustered standard errors in parentheses. The dependent variable in columns 1 and 2 is $\Delta\frac{t}{y}$, the change in the ratio of total taxation to state income. Columns 3 and 4 the dependent variable is $\Delta\frac{g}{y}$, the change in the ratio of total state government expenditure to state income. Columns 1 and 3 are estimated using the specification given in Eq. (8), columns 2 and 4 augment this specification with time and state fixed effects. Variable definitions are as for Table 4. All specifications also include the first differences of: state income, state population, the percentage of children, and the percentage of senior citizens

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

have 38 years of observations and, hence, the bias is small, it is instructive to validate the results by comparison with bias corrected estimators (BCLSDV estimators). These estimators, as proposed by Kiviet (1995) and extended by Bruno (2005a), subtract estimates of the finite sample bias from the results of alternative consistent estimators, such as difference-GMM. This approach is unfortunately not a panacea—its effectiveness relies in part on the performance of the pre-correction estimators, which, as Kiviet (1995) notes, exhibit much greater dispersion than the LSDV estimator. It is also the case that these estimators are consistent only when the cross sectional dimension of the panel tends to infinity while the time-series dimension is fixed, unlike our sample where N and T are of similar dimension. The mismatch between the available sample and the assumed asymptotics, along with the well-documented problems with the number and relevance of instruments when T is large (cf. Roodman 2009), mean that the BCLSDV estimator may or may not represent an

Table 10 Bias corrected least square dummy variable estimates

	(1) $\overline{ideo}_c$	(2) $\overline{ideo}_{ADA/COPE}$	(3) $\overline{ideo}_{g,NOM}$	(4) $\overline{ideo}_c$	(5) $\overline{ideo}_{ADA/COPE}$	(6) $\overline{ideo}_{g,NOM}$
$(\frac{t}{y})_{it-1}$	0.812***	0.822***	0.833***			
	(0.019)	(0.018)	(0.019)			
$(\frac{g}{y})_{it-1}$				0.808***	0.824***	0.830***
				(0.019)	(0.018)	(0.018)
$\overline{ideo}_i$	−0.512*	−0.334*	−0.396	−0.749	−0.545	−0.418
	(0.293)	(0.180)	(0.681)	(0.593)	(0.438)	(0.988)
income × $\overline{ideo}_i$	0.076***	0.037**	0.041	0.201***	0.085*	0.103
	(0.029)	(0.019)	(0.058)	(0.060)	(0.045)	(0.095)
income	−0.081***	−0.057***	−0.055	−0.237***	−0.157***	−0.157**
	(0.024)	(0.020)	(0.041)	(0.048)	(0.043)	(0.067)
FDLH	0.044	0.111	0.137	−0.055	0.142	0.191
	(0.121)	(0.119)	(0.163)	(0.278)	(0.271)	(0.272)
FDUH	0.015	0.054	0.038	0.080	0.213	0.177
	(0.118)	(0.113)	(0.150)	(0.222)	(0.221)	(0.224)
demgov	−0.000	−0.002	0.001	−0.021	−0.041	−0.037
	(0.019)	(0.021)	(0.028)	(0.045)	(0.047)	(0.049)
demboth	0.075**	0.066*	0.065	0.012	−0.025	−0.027
	(0.033)	(0.033)	(0.045)	(0.072)	(0.071)	(0.072)
polcomp	0.131	0.090	0.007	−0.076	−0.036	−0.141
	(0.331)	(0.310)	(0.406)	(0.574)	(0.564)	(0.578)
R^2						
N	1724	1724	1724	1771	1771	1771

All estimates are the Bias Corrected Least Squares Dummy Variable estimator proposed by Kiviet (1995) and extended by Bruno (2005). Bootstrap standard errors in parentheses. Estimates are initialized by the Andersen-Hsiao estimator and then corrected such that the maximum bias is $\mathcal{O}(N^{-1}T^{-2})$
Controls are as for Table 4
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

improvement. The Monte-Carlo study presented by Bruno (2005b) suggests that using the Andersen-Hsiao (AH) estimator to obtain the pre-correction estimates gives the best results. Although concerns remain about whether the assumptions necessary for this estimator to be consistent are reasonable in this context, they are much less demanding than those of the alternatives studied by Bruno. The resulting estimates were then corrected such that the maximum bias was of the order $\mathcal{O}(N^{-1}T^{-2})$. The results of the BCLSDV estimators are reported in Table 10 and are broadly consistent with those in Tables 7 and 9 and are only slightly less precise, as is to be expected. Arellano (2003) notes that in the case at hand the Nickell bias is always downwards, thus suggesting that the coefficients in Table 7 are (very slightly) conservative. This known, small, downwards bias compares well to uncertainties surrounding the properties of the BCLSDV estimators for our sample (as well as the availability of analytical standard errors) and thus are preferred.

As a further test of robustness we examined the impact of institutions. Besley and Case (2003) investigate how inter-state differences in taxation levels are explained by differences in voter registration requirements, spending and taxation constraints, limits on corporate

political donations, and the veto power of governors. One institutional variable which we found to be a particularly robust driver of state government size was the existence of a super majority rule.[22] Super majority rules are found by Knight (2000) as well as Besley and Case (2003) to have a negative effect on state spending. Table 11 columns (1)–(11) contain results augmenting the specification in Table 7 column 1 with each of the institutional variables one at a time.[23] The results further suggest that divided government, *split*, or its interaction with a gubernatorial line-item veto, *vetosplit*, leads to lower taxes. This suggests that divided government, consistent with Magalhães and Ferrero (2010) and Bjørnskov and Potrafke (2011) as well as Besley and Case (2003), is another important source of variation. Column 12 includes *supmaj*, *split*, and *veto* simultaneously.[24] However, the key result does not change. In every specification the inference regarding ideology and its interaction with income remains unaltered.

Pickering and Rockey (2011) also use a two-step procedure to analyze empirically the relationship between government size, ideology, and income. This procedure focuses on the specific theoretical predictions that the income elasticity will be increasing in the relative leftism of voters and decreasing in the level of income.[25] The first stage obtains state-specific time-varying estimates of the income elasticity of state spending. Specifically, regressions of the following form are estimated for rolling 20-year subsets of the data:

$$t = \beta_{0i} + \beta_{1i} y_{it} + X'\beta + \varepsilon_{it},$$

where X comprises the same controls as used above and y is state income per capita. Estimated income elasticities thus may vary across space and time. Parameter estimates for β_{1ia} (where the subscripts i and a, respectively, denote states and the midpoint of the time window) are collected and in the second stage these 'Wagner coefficients' are then regressed on the midpoint ideology measure and midpoint income:

$$\widehat{\beta}_{1ia} = \gamma_0 + \gamma_1 \overline{ideo}_{ia} + \gamma_2 y_{ia} + \zeta_{ia}.$$

Using the preferred ideology series ($\overline{ideo}_c$) estimation of the second stage yielded

$$\beta_{1ia} = \underset{(0.140)}{0.843} + \underset{(0.027)}{0.135}\,\overline{ideo}_{ia} - \underset{(0.012)}{0.059}\, y_{ia} \tag{9}$$

(with robust standard errors reported in parentheses). As with the OECD sample, the Wagner coefficients are positively and significantly associated with ideology and negatively and significantly associated with income, in accordance with the theoretical predictions, respectively contained in Eqs. (6) and (5) above. Wagner coefficients for archetypal left- and right-wing regimes are reported in Table 12. The first clear result is the decline in the income elasticity of government. At 1960s income levels, a $1,000 increase in income roughly is estimated to lead to a one-half percent increase in the size of state government, whilst at 1997 levels income elasticity of demand for government has declined to close to zero.

[22] In particular, we estimated column 2 of Table 13, column 4 of Table 14 and column 1 of Table 15 in Besley and Case (2003), with the inclusion of the lagged dependent variable, and using clustered robust standard errors. In this more demanding econometric specification, only the super majority rule survived in terms of statistical significance. These results are available on request.

[23] Ideally, we would include all of institutional variables at once. The problem with this approach is that many of these variables are correlated with each other. Besley and Case (2003) also take the approach of examining particular institutions in isolation.

[24] It is not possible to adequately distinguish between the effects of *split* and *vetosplit* as they are highly correlated.

[25] The first of these hypotheses restates Eq. (6) and the second Eq. (5).

Table 11 Including measures of institutional variation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
$(\frac{t}{y})_{it-1}$	0.757***	0.764***	0.768***	0.768***	0.765***	0.764***	0.714***	0.765***	0.717***	0.767***	0.767***	0.710***
	(0.035)	(0.032)	(0.034)	(0.034)	(0.033)	(0.035)	(0.036)	(0.033)	(0.037)	(0.034)	(0.034)	(0.036)
$\overline{ideo_i}$	−0.698*	−0.786**	−0.756**	−0.727**	−0.711*	−0.714**	−1.178**	−0.794**	−1.169**	−0.769**	−0.733**	−1.139**
	(0.389)	(0.356)	(0.364)	(0.355)	(0.369)	(0.350)	(0.476)	(0.348)	(0.468)	(0.359)	(0.360)	(0.457)
income × $\overline{ideo_i}$	0.106**	0.105***	0.102***	0.101***	0.097**	0.098**	0.168***	0.105***	0.161***	0.103***	0.101***	0.163***
	(0.042)	(0.038)	(0.038)	(0.037)	(0.038)	(0.037)	(0.047)	(0.036)	(0.048)	(0.037)	(0.037)	(0.046)
stinc	−0.111***	−0.102***	−0.102***	−0.101***	−0.099***	−0.102***	−0.152***	−0.104***	−0.149***	−0.103***	−0.101***	−0.155***
	(0.038)	(0.035)	(0.035)	(0.035)	(0.036)	(0.035)	(0.044)	(0.034)	(0.044)	(0.035)	(0.035)	(0.043)
primarytype	0.003											
	(0.048)											
regveh		0.074										
		(0.044)										
regpolls			−0.023									
			(0.092)									
nonbind				0.052								
				(0.045)								
bind					0.053							
					(0.053)							
supmaj						−0.097***						−0.107**
						(0.036)						(0.045)
veto							−0.173					−0.184
							(0.179)					(0.178)
split								−0.039**				−0.047**
								(0.016)				(0.018)

Table 11 (*Continued*)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
vetosplit									−0.042**			
									(0.020)			
lameduck										−0.010		
										(0.019)		
initiatives											−0.051	
											(0.060)	
N	1581	1724	1724	1724	1724	1724	1491	1724	1491	1724	1724	1491
R^2	0.855	0.854	0.854	0.854	0.854	0.854	0.855	0.854	0.855	0.854	0.854	0.856

(Clustered) Standard errors in parentheses. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$. $\frac{t}{y}$, the ratio of total taxes to state income, is the dependent variable. All specifications also include state and year fixed effects and political and demographic controls as in Table 4. *regveh* is an indicator variable taking a value of 1 if a state allows voter registration via vehicle registration, *regpolls* takes a value of 1 if polling day registration is allowed, *nonbind* takes a value of 1 if there are tax/spending limitations that don't bind, *bind* equals 1 if they may. *supmaj* is equal to 1 if a state requires a supermajority to enact any increase in taxation, *veto* is 1 when a governor has a line-item budget veto, *split* equals 1 if the governor's party is not that of the united majority party in the legislature, *vetosplit* is the interaction of the last two variables, *lameduck* equals 1 in any year in which the incumbent governor can't re-run for election, *initiatives* describes whether the state allows voter initiatives

Table 12 Estimated Wagner coefficients for archetypal left- and right-wing regimes, 1960 and 1997 levels of income

	1960 mean income	1990 mean income
Archetypal left	0.521	0.044
Archetypal right	0.494	0.017

The estimated coefficients are generated using equation (9) in the text

The 1960 mean income was $6,722 per capita, and the 1997 mean income was $14,800 per capita. The archetypal left-wing regime has an ideology measure set equal to 0.35, and the archetypal right-wing regime has an ideology measure set equal to 0.55

These results clearly support the hypothesis implied by Eq. (5) above. At the higher levels of income, the growth of government has essentially leveled off. The differences attributable to ideology seem at first sight to be smaller—though to repeat, the coefficient on ideology in the second-stage regression is highly significant, in support of Eq. (6) above. The important point to recognize here is that the ideological differences accumulate so that small differences in income elasticity translate, over decades, into meaningful differences in government size. For example, suppose that both types of regime in 1960 have government size equal to 3.852 % of state income and state income per capita of $6,724 (the averages in that year). Given representative income growth up to the 1997 average state income, these numbers suggest that state government rises to 6.15 % of state income in the archetypal right-wing state, and to 6.50 % in the archetypal left-wing state. The difference is 0.35 % of state income, which represents about one-third of a standard deviation of the observed differences.

4 Conclusions

The notion that ideology explains differences in government size is as old as the observation that government size differs across countries. Likewise, the idea that economic growth explains growth in government size is as old as the observation that governments have tended to grow over time. Pickering and Rockey (2011) combine these ideas and argue for an interaction between ideology and income, and find this to be a significant determinant of the growth and divergence of government size in OECD countries. This paper takes the same hypothesis to US state level data. For three reasons the US data are preferable as a test of the model. Firstly, there are more data and, secondly, the ideology data are better than in the original paper. Third and perhaps most importantly there is much less unobserved heterogeneity in institutions and culture across states.

Differences in ideology have played an important role in shaping the evolution of US state government size. The results in Table 7 suggest that tax levels in archetypal right-wing states have grown at under half the rate of their left-wing equivalents. Moreover, this difference of 1.21 % is equal to about one standard deviation of the observed differences in state government size, suggesting that ideological differences when interacted with income account for a sizable portion of the total observed variation.

In the introduction we noted an absence of consensus concerning the driving causes of the observed differences in the state-level public sector size. This paper places citizen ideology as foremost among the contending explanations, although this should not be seen as precluding a role for institutions as argued by Besley and Case (2003). The important

condition is that the impact of ideology is contingent on income. As noted in Pickering and Rockey (2011), ideology will itself have its own deeper determinants, though this must be the subject of future research.

Acknowledgements We thank Tim Besley and Richard Fording for making their data available and seminar participants at the University of York. We also thank the editor and the anonymous referees. The standard disclaimer applies. Part of this work took place whilst Rockey was visiting the Institut d'Economia de Barcelona and he is grateful for their generous support and hospitality.

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