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ABSTRACT: This paper analyzes the impact of ideology on the size of US state governments. Following Pickering and Rockey (2011) this impact is hypothesized to increase with mean 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.

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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 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 manifestos 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

¹An 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.

This paper takes the same hypothesis to US state level data. There are three reasons why the 48 continental states of the United States represent a better data set than 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 the sample is larger. 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 grew by 5% in Minnesota, and actually shrank in Louisiana (by 0.19%) and Wyoming (by 0.24%). A general upward trend, together with an increasing dispersion thus characterizes the US state level data as with the OECD sample.

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” (ibid, p. 38).² 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 colleagues in the north. Nonetheless, it is interesting that “recent work finds support for party control” (ibid, p. 39), including the regressions reported by Besley and Case themselves.³ The apparent late ignition of the

²In 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.

³The relevant results in Besley and Case (2003, pp. 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

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.⁴ These data are compiled from the observed voting patterns of the state's congressional delegation 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 manifestos. 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 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.

⁴As 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), Kim and Gerber (2005) have all used these data as determinants of state-level policy.

include 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 of 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.

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 section 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.⁵ Ideology is defined by preferences for the public good relative to private consumption. One possible justification is that services like education, health, defence and law and order may be underprovided by private markets, and should enter the utility function distinctly precisely because they are distinct. Another is that citizens derive altruistic utility from redistribution (perhaps in kind).⁶ 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 to finance pure redistribution and/or a distinct public good 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. β defines the prevailing ideology in the state - with greater values

⁵It is simplest to think of the public good as rival and excludable rather than a public good of the Samuelson variety.

⁶See also Alesina et al (2001), Alesina and Angeletos (2005), Benabou (2008) and Picketty (1995).

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

$$t\bar{y} = g$$

where \bar{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

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

where y_m is median income.⁷ Assuming that the distribution of income is constant and defining $m = \frac{\bar{y}}{y_m} (> 1)$ 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

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

In the general formulation a shift to the left (increase in β) increases the size of the govern-

⁷Note that given the properties of F and G the equilibrium is unique and bounded, i.e. $0 \leq t^* < 1$.

ment 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.⁸ 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 which 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.⁹ This utility function results in

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

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

Given this utility function then it follows that

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

⁸As well as entering (2) directly, c_m and g also depend on \bar{y} , hence restrictions on the third-order derivatives are required.

⁹Meltzer and Richard (1983) also employ this functional form.

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 US.) Equation (3) also implies Wagner's law, that the relative state size will increase with mean income:

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

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

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

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,

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

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. The size of the public sector is defined as total taxes per capita divided by state income per capita.¹⁰ 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 increasing 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.

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 manifesto data by Kim and Fording (1998, 2003) also depict a rightward shift by both major parties in the 1980s.

¹⁰Total taxes are defined as the sum of sales, income and corporate taxes. The data are described in full in Besley and Case (2003).

State level ideology data are taken from Berry et al (2010) (hereafter BFRHK), who revise and extend their original data (Berry et al, 1998) 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 utilized here for the sake of robustness.

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 does 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. Therefore, the median state-citizen ideology measures are preferred. However, median voter models by construction abstract away 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 is also clearly 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 and 2010) describe these data in more detail and argue strongly for temporal variation within states (hence criticizing fixed 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 of the ideology data with 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).¹¹ 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.¹² 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 by state. 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

¹¹Note 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.

¹²Besley and Case (2003) also used square 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 square terms. Secondly the theory is concerned with income elasticity and inference is more straightforward when just the linear term is included.

dependent variable. This time the relationship between ideology and state size is found to be negative, though again insignificant.

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 model of Section 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.¹³ It is 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 specification¹⁴ in column (4) of table 4 but there is still little evidence for any political determinants of the size of government.

The evidence therefore does not support a relationship between government size and *contemporaneous* ideology. In fact this resonates with Pickering and Rockey (2011) who 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 into 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 previous 10 years. Taking the average of the past 10 years' data also alleviates concerns of endogeneity - the ideology measures now substantially predate the observations

¹³This follows immediately from the state budget constraint.

¹⁴The results below are robust to the omission of *Transfers*.

on government size.

In table 5 estimation results are presented using the lagged ideology data. 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 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 include the lagged dependent variable (LDV). There are (at least) two good reasons for including the LDV. Firstly total government size is a slow 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).¹⁵

Table 7 contains the estimation results, confirming firstly that government size is highly

¹⁵The time dimension is sufficiently long that the bias engendered by the presence of the LDV is negligible (Nickell, 1981).

persistent. Columns 1a, 2a and 3a contain the estimated short-run (period t) 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 analogous experiment 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 \$6722 in 1960 to \$14800 in 1997 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 the interaction term with income. Following Braumoeller (2004), Figure 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 spending until a minimum level of income - around \$14,000 - is attained.

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.¹⁶ Super majority rules are found by Knight (2000) as well as Besley and Case (2003) to have a negative effect on state spending. Table 8 columns (1)-(11) contain results augmenting the specification in table 7 column (1) with each of the institutional variables one at a time.¹⁷ The key result doesn't change. In every specification ideology and its interaction with income remain significant. The results further suggest that divided government, *split*, or its interaction with a gubernatorial line-item veto, *vetosplit*, leads to lower taxation. 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.¹⁸ The inference regarding ideology and its interaction with income remains unaltered.

Pickering and Rockey (2011) also use a two-step procedure to empirically analyze 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.¹⁹ The first stage obtains state-specific

¹⁶In 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.

¹⁷Ideally 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.

¹⁸It is not possible to adequately distinguish between the effects of *split* and *vetosplit* as they are highly correlated.

¹⁹The first of these hypotheses restates equation (6) and the second equation (5).

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

$$\beta_{1ia} = \underset{(0.140)}{0.843} + \underset{(0.027)}{0.135} \overline{ideo}_{ia} - \underset{(0.012)}{0.059} y_{ia} \quad (7)$$

(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 equations (6) and (5) above. Wagner coefficients for archetypal left- and right-wing regimes are reported in table 9. The first clear result is the decline in the income elasticity of government. At 1960s income levels a \$1000 increase in income roughly is estimated to lead to a 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. These results clearly support the hypothesis implied by equation (5) above. At the higher levels of income, the growth of government has essentially levelled 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 equation (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 idea that ideology explains differences in government size is as old as the observation that government size differs across countries. 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 the left-wing equivalent. Moreover, this difference of 1.21% is equal to about 1 standard deviation of observed differences in state government size, suggesting that ideological differences when interacted with income accounts for a sizable portion of the total observed variation.

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

	mean	sd	min	max
1950	3.047	0.987	0.960	5.344
1960	3.852	1.099	1.423	6.354
1970	5.172	1.107	2.492	7.602
1980	5.381	1.054	2.450	7.436
1990	5.695	1.126	1.957	7.716
Total	4.629	1.471	0.960	7.716

Data are in percentage terms.

Each year reported contains data for all 48 states.

Table 2: Descriptive statistics for $ideo_c$

(1)

	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.

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

Table 4: Replicating Besley and Case

	(1)	(2)	(3)	(4)
	total taxes per capita	total taxes per capita	$\frac{t}{y}$	$\frac{t}{y}$
FDLH	48.002** (22.268)	64.444 (56.328)	0.370 (0.441)	0.744 (0.445)
FDUH	41.662** (19.643)	28.504 (41.836)	0.489 (0.315)	0.541 (0.371)
demgov	-0.497 (3.210)	-4.842 (5.381)	-0.000 (0.044)	-0.019 (0.050)
demboth	5.451 (5.690)	8.079 (10.417)	0.055 (0.085)	0.030 (0.072)
polcomp	89.554* (54.293)	75.220 (127.774)	0.943 (0.894)	-1.233 (1.030)
citi6008	18.256 (21.730)	4.885 (54.266)	-0.179 (0.430)	-0.670 (0.493)
transhare				0.546 (0.677)
Years in sample	1960-1993	1960-1997	1960-1997	1960-1997
Number of Observations	1583	1724	1583	1583
Number of States	47	47	47	47
R^2 (within)	0.899	0.894	0.679	0.645

Standard errors (in parentheses) in column 1 are calculated under the assumption of homoskedasticity. (Clustered) Robust standard errors in parentheses for columns 2-4. $\frac{t}{y}$ is the ratio of total taxes 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. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5: Using Lagged Ideology Measures

	(1)	(2)	(3)
	\overline{ideo}_c	$\overline{ideo}_{g,ADA/COPE}$	$\overline{ideo}_{g,NOM}$
\overline{ideo}_i	0.006 (0.881)	0.287 (0.368)	1.007 (0.858)
income	-0.047 (0.098)	-0.047 (0.099)	-0.048 (0.100)
FDLH	0.672 (0.458)	0.626 (0.467)	0.598 (0.464)
FDUH	0.378 (0.369)	0.403 (0.365)	0.391 (0.363)
demgov	-0.041 (0.050)	-0.063 (0.052)	-0.077 (0.052)
demboth	0.061 (0.070)	0.050 (0.072)	0.043 (0.071)
polcomp	-1.623 (1.225)	-1.903* (1.000)	-1.854* (0.950)
transhare	0.290 (0.673)	0.281 (0.701)	0.261 (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

$\frac{t}{y}$, the ratio of total taxes to state income, is the dependent variable.

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

Table 6: Introducing the Interaction of Ideology Measures and Income

	(1)	(2)	(3)
	\overline{ideo}_c	$\overline{ideo}_{g,ADA/COPE}$	$\overline{ideo}_{g,NOM}$
\overline{ideo}_i	-4.361*** (1.232)	-1.993** (0.843)	-1.702 (2.298)
$income \times \overline{ideo}_i$	0.497*** (0.118)	0.241*** (0.075)	0.246 (0.182)
income	-0.366*** (0.085)	-0.212** (0.086)	-0.194 (0.124)
FDLH	0.057 (0.458)	0.329 (0.470)	0.491 (0.467)
FDUH	0.255 (0.352)	0.552 (0.346)	0.477 (0.354)
demgov	-0.041 (0.046)	-0.073 (0.052)	-0.067 (0.054)
demboth	0.101 (0.069)	0.043 (0.067)	0.040 (0.069)
polcomp	0.079 (1.055)	-1.107 (0.979)	-1.669* (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

$\frac{t}{y}$, the ratio of total taxes to state income, is the dependent variable.

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

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*** (0.034)		0.777*** (0.035)		0.783*** (0.034)	
$\overline{ideo_i}$	-0.763** (0.356)	-3.281** (1.461)	-0.439* (0.242)	-1.967* (1.079)	-0.475 (0.585)	-2.192 (2.778)
income $\times \overline{ideo_i}$	0.103*** (0.037)	0.443*** (0.143)	0.049** (0.024)	0.220** (0.100)	0.051 (0.047)	0.238 (0.217)
income	-0.102*** (0.035)	-0.441*** (0.110)	-0.069** (0.030)	-0.319*** (0.102)	-0.066* (0.033)	-0.306** (0.123)
FDLH	0.043 (0.156)		0.115 (0.157)		0.146 (0.156)	
FDUH	0.019 (0.115)		0.071 (0.106)		0.055 (0.109)	
demgov	-0.000 (0.014)		-0.003 (0.017)		-0.000 (0.017)	
demboth	0.078** (0.030)		0.067** (0.029)		0.067** (0.029)	
polcomp	0.150 (0.336)		0.050 (0.313)		-0.058 (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

$\frac{t}{y}$, the ratio of total taxes to state income, is the dependent variable.

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

Table 8: Including Measures of Institutional Variation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
$(\frac{t}{y})_{it-1}$	0.757*** (0.035)	0.764*** (0.032)	0.768*** (0.034)	0.768*** (0.034)	0.765*** (0.033)	0.764*** (0.035)	0.714*** (0.036)	0.765*** (0.033)	0.717*** (0.037)	0.767*** (0.034)	0.767*** (0.034)	0.710*** (0.036)
\overline{ideo}_i	-0.698* (0.389)	-0.786** (0.356)	-0.756** (0.364)	-0.727** (0.355)	-0.711* (0.369)	-0.714** (0.350)	-1.178** (0.476)	-0.794** (0.348)	-1.169** (0.468)	-0.769** (0.359)	-0.733** (0.360)	-1.139** (0.457)
$\text{income} \times \overline{ideo}_i$	0.106** (0.042)	0.105*** (0.038)	0.102*** (0.038)	0.101*** (0.037)	0.097** (0.038)	0.098** (0.037)	0.168*** (0.047)	0.105*** (0.036)	0.161*** (0.048)	0.103*** (0.037)	0.101*** (0.037)	0.163*** (0.046)
stinc	-0.111*** (0.038)	-0.102*** (0.035)	-0.102*** (0.035)	-0.101*** (0.035)	-0.099*** (0.036)	-0.102*** (0.035)	-0.152*** (0.044)	-0.104*** (0.034)	-0.149*** (0.044)	-0.103*** (0.035)	-0.101*** (0.035)	-0.155*** (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*** (0.036)						
veto							-0.173 (0.179)					-0.107*** (0.045)
split												-0.184 (0.178)
vetosplit								-0.039** (0.016)	-0.042** (0.020)			-0.047*** (0.018)
lameduck										-0.010 (0.019)		
initiati											-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. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. $\frac{\partial t}{\partial y}$, the income elasticity of state spending, is the dependent variable. All specifications also included FDLH, FDUH, demgov, demboth, polcomp, and transhare. 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.

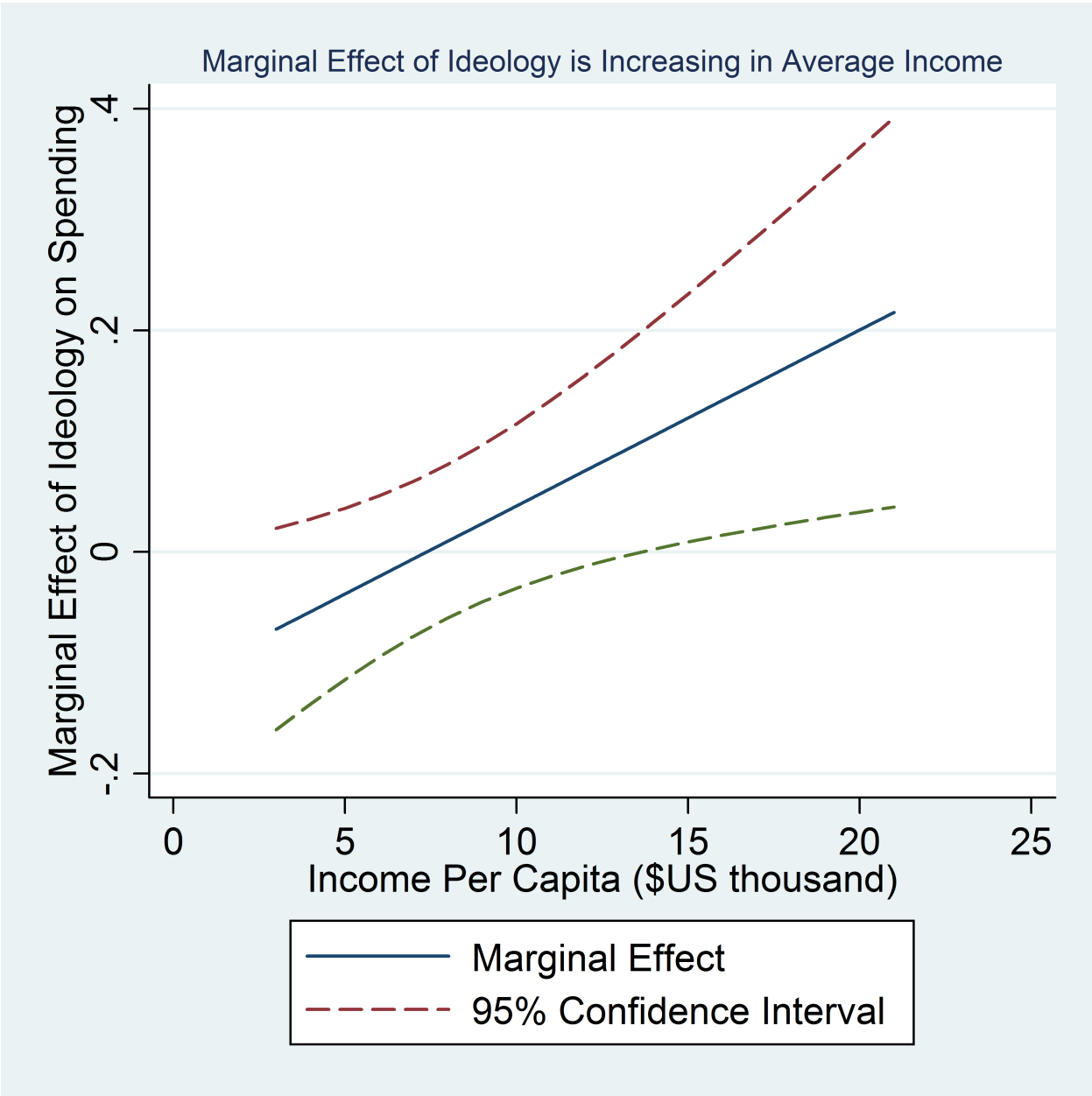


Figure 1: Marginal effect of Ideology on government spending conditional on state income per capita

Table 9: 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 (7) 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.

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