Swing Voters, Electoral Risk, and the Provision of Public Services (Working Paper*)

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Abstract

Why is there such enormous variation in public services expenditures across and within advanced democracies? The internal composition of the electorate may be an important factor in explaining this variation. When either core or swing voters dominate in their electoral relevance, incumbents can be expected to allocate more resources to the predominant group through targeted goods and fewer resources to public services. However, when the electoral relevance of both groups is at balance, transfer spending is associated with high political risks because no single voter group can ensure election victory and particularistic benefits can cause alienation among non-beneficiaries. Therefore, under such circumstances, the highest level of public services provision—as a means to hedge against electoral uncertainty, accommodate both groups simultaneously, and demobilize opposition voters—can be expected. Two empirical analyses in different contexts—one across American states and one across OECD countries—deliver evidence in favor of this theory.

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The most recent version of this paper may be obtained at the following URL: http://www.janvogler.net/Swing_Voters_PSE.pdf

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1 Introduction

What is the relationship of electoral competition and the supply of public services? A strand of political economy claims that electoral competition is generally beneficial to the vast majority of the population due to lower levels of corruption, fewer rent-seeking opportunities, the provision of new information to the electorate, and consequently higher public services expenditures (PSE) (Beer & Mitchell, 2004; Besley, Persson, & Sturm, 2010; Brown & Mobarak, 2009; Bueno de Mesquita, Morrow, Siverson, & Smith, 2001; Bueno De Mesquita & Smith, 2005; Deacon, 2009; Lake & Baum, 2001; Pop-Eleches & Robertson, 2015). The question of what determines PSE is important because higher quality of public health and education contributes to economic growth (Baum & Lake, 2003). Moreover, the successes of the East Asian Tiger states are partially attributed to their public investments, especially in education and infrastructure (Page, 1994; Stiglitz, 1996). On the other hand, the poor economic performance of many sub-Saharan African countries could be in part due to low quality of public services (Easterly & Levine, 1997; Stasavage, 2005).

Given the relevance of public services, it is puzzling that there is such significant variation in their provision *between and within* advanced democracies—data by the World Bank from the 1990s and 2000s suggest that differences are remarkable (World Bank Group, 2015). For example, on average Australia spent 35.7% of GDP per capita on each student in primary and secondary education while Denmark spent 59.1%. This is striking because Australia has compulsory voting, implying a large "selectorate", which should be associated with high levels of PSE (Bueno de Mesquita et al., 2001).

Considering this variation, the questions this paper aims to answer are: Why does the

level of public services provision vary remarkably between the advanced democracies? How does the composition of the electorate shape strategic decisions of incumbent parties in this respect?

These questions are related to several ongoing debates in the literature on electoral competition and political responsiveness (Blome, 2016; Key, 1984). Many prominent studies support the notion that politically central groups are the main beneficiaries of electoral competition (Downs, 1957; Fleck, 2001; Lindbeck & Weibull, 1987; Stokes, 2005). Yet, others claim that incumbents primarily allocate benefits to their core constituency to win elections (Cox & McCubbins, 1986; Nichter, 2008). The ability of incumbent parties to deliver economic favors to core or swing voters may influence who they target (Dixit & Londregan, 1996). Accordingly, the "core versus swing voter" literature primarily focuses on the question of which of the two groups is the primary beneficiary of electoral competition (Cox, 2010, 342).

However, theoretical claims that a specific voter group reaps most of the benefits of electoral competition can be considered at odds with the literature that sees the entire (s)electorate or the "winning coalition"—which in many democracies is a very large subset of the population—as the main beneficiary (as a result of higher PSE) (Bueno de Mesquita et al., 2001; Bueno De Mesquita & Smith, 2005; Stasavage, 2005). There is also an ongoing debate on whether competitive elections generally improve the quality of public services (Cleary, 2007; Kudamatsu, 2012; Ross, 2006). Within-country variations in the closeness of elections are one potential explanation for differences in public services supply but this factor alone cannot account for the enormous levels of cross-national divergence (Besley et al., 2010; Hobolt & Klemmensen, 2008).

Only few studies build on both the core versus swing voter literature and the literature on public services. This includes the portfolio perspective—according to which parties simultaneously invest into both targeted goods for their core voters and public goods—and the view that everyone gains from public services but poor voters benefit most (Diaz-Cayeros, Estevez, & Magaloni, 2016; Min, 2015).

In short, many scholarly contributions speak to the relationship of electoral competition and public services. The predominant argument is that this relationship is positive. However, both theory and empirical evidence from the core versus swing voter literature cast doubt on the claim that incumbents generally have incentives to benefit the entire electorate through high public services supply. Given a constrained budget, the goals of accommodating swing voters, core voters, or the entire electorate through public services may be at odds with each other.

This paper addresses the questions raised above by considering two arguments about how the internal composition of the electorate can influence the provision of public services. A conventional view that can be derived from parts of the existing literature on macroeconomic policies suggests a *partisanship effect*, meaning that the relative electoral support of left-wing parties heavily and positively influences the level of public services supply. In contrast to this traditional view, a new theory based on the size of the swing vote and the associated electoral risk will be introduced here.

2 Theory

When an election takes place, the winning party receives crucial information about the composition of the electorate in terms of core, swing, and opposition voters. Such information is easily obtained from exit-poll analysis among others (Best & Krueger, 2012; Hilmer, 2008). It allows incumbents to make strategic political choices to maximize their chances of winning the next election. As there are constraints on public resources, one of the most important decisions by newly elected parties is how to allocate these resources in the medium term (Fleck, 1999; J. Green, 2011; Wright, 1974).

In general, incumbent parties in parliament and government can allocate their budget to targeted goods or public services. Public services (or "collective goods") are defined as investments by the government that broadly benefit the vast majority of a country's population (Kitschelt & Wilkinson, 2007). The alternative are targeted goods, which are defined as transfers accessible only to a subset of the population, comparable to club goods. How can the composition of the electorate affect the strategic spending choices of newly elected governments?

2.1 The Traditional Perspective: The Impact of Partisanship

If we consider the internal composition of the electorate as a key factor for the provision of public services, the electoral support that left-wing parties receive could potentially be decisive. Left-wing core voters often have a more positive attitude towards government spending, including the supply of public services (Jacoby, 1994, 2000). Their view might in part result from the redistributive nature of some public services (Ansell, 2010). This argument is

compatible with the view that partisanship significantly influences macroeconomic policies and public spending (Cusack, 1997; Hibbs, 1977; Tellier, 2006). Therefore, the conventional perspective on how the internal composition of the electorate affects PSE can be summarized in the following hypothesis:

Hypothesis 1: Partisanship is the decisive factor influencing the level of PSE. The stronger the electoral support of left-wing parties, the higher PSE will be.

2.2 An Alternative Theory: Swing Voters and Perceived Electoral Risks

In contrast to the partisanship perspective, we introduce an alternative theory of electoral risk based on the relative size of the swing vote. The key argument is that when the swing vote is at an intermediary size no single voter group can ensure election victory. As a consequence, incumbent parties are forced to pursue a strategy in which they accommodate multiple voter groups simultaneously. As elaborated below, one of the most effective ways to do this is to spend broadly on public services, which is why we expect PSE to be at their maximum when no single voter group dominates in its relative size.

Voters typically receive the highest benefits from transfers which are specifically designed for themselves. This is true even for left-wing core voters who have more positive attitudes towards public services. For example, workers and employers in coal mining welcome governmental subsidies for their industry and people who are in-between jobs welcome higher public spending on unemployment benefits. Voters generally prefer a targeted benefit to the diffuse and often indirect positive consequences of public goods provision (Gottlieb, 2016).

However, the downside of targeted benefits is that they could mobilize opposition voters and often alienate excluded voter groups (Chhibber & Nooruddin, 2004, 162). Social comparison processes, in which individuals observe the benefits that others receive and relate it to their own gains, can easily cause such alienation (Buunk & Gibbons, 2006; Festinger, 1954; Mussweiler, Rüter, & Epstude, 2006). Studies have shown that differences in economic or financial benefits often dissatisfy those who profit relatively less (Pfeffer & Langton, 1993). Furthermore, individuals that observe the positive treatment of others in a specific social dimension—in which they themselves receive a negative treatment—tend to exhibit negative reactions (Salovey & Rodin, 1984). Such social comparison processes are not restricted to individuals but can also manifest themselves on group levels (Tajfel & Turner, 1979; Zagefka & Brown, 2006), i.e. between social groups and voter groups. This means that particularistic benefits are always associated with the political risk of alienating the excluded groups.

For instance, after the Free Democratic Party (FDP) of Germany experienced an unprecedented electoral success and joined the government in 2009, it pushed through tax reductions for hotel owners, which were among its most important (financial) supporters. This move alienated many of the swing voters that had voted for it. The result was a dramatic electoral loss in the 2013 election (Patton, 2015). In short, voters have the strongest preference for targeted benefits but governments that deliver such exclusive benefits run a high risk of alienating voter groups excluded from them.

The key alternative are PSE that have broader—but on average smaller—positive effects for most of the population. First, public services, such as environmental protection, increase the quality of life of citizens (Min, 2015; OECD, 2015; The Economist, 2005). Second, public services create positive externalities: public education and health care reduce crime rates,

contribute to economic growth, and thereby increase social and economic stability (Baum & Lake, 2003; Lochner & Moretti, 2004; Machin, Marie, & Vuji, 2011). Higher education expenditures could also potentially increase a country's international competitiveness (Avelino, Brown, & Hunter, 2005). Third, the initial establishment of public services often leads to positive economic spillover effects (International Monetary Fund, 2014). Two public services have been identified as having significant positive medium- and long-term effects on the economy, which makes them ideal for this study focused on medium-term budget decisions of incumbent parties: education and health care (Baum & Lake, 2003).

How does the internal composition of the electorate affect the decision of incumbents to spend public resources on public services or targeted goods? Core voters—with a strong party attachment—might abstain from voting when they are dissatisfied with their party's performance, making their activation important. The mobilization of core voters is generally easier than the attraction of other voter groups because politicians are aware of their interests and responsiveness (Cox & McCubbins, 1986; Dixit & Londregan, 1996; Holbrook & McClurg, 2005).

Accordingly, a large core constituency creates a convenient strategic opportunity for the incumbent party. By supplying targeted goods to its core, the incumbent party could mobilize a sufficient number of voters to win the next election. Especially when the swing vote is marginal in its relative size, it might be too costly to identify and attract swing voters while not all core voters are mobilized. Empirical evidence and computational models demonstrate that the core often is the key to winning elections (Adams, Brunell, Grofman, & Merrill III, 2010; Campbell, 2008; Chen, 2013; Cox, 2010).

However, the relevance of swing voter interests for policies has been underscored by

many prominent studies (Downs, 1957; Lindbeck & Weibull, 1987; Meltzer & Richard, 1981; Stokes, 2005). Under which circumstances is it a viable option for governments to target swing voters? When the swing vote is large relative to an incumbent's core constituency, it is more important for the ruling party to attract this politically central group. Swing voters exist in all democracies and are defined as the group of voters that do not have a strong party attachment (Dahlberg & Johansson, 2002; Mayer, 2008; Stokes, Dunning, Nazareno, & Brusco, 2013). They might have a weak preference for any party, but unlike core voters they are open to persuasion through economic favors. While politicians can hope to attract their vote on a case-by-case basis, the literature on voting behavior has established that factors such as PSE typically cannot change their long-term party (non-)attachment (D. P. Green & Palmquist, 1990, 1994; D. P. Green, Palmquist, & Schickler, 2004). Thus, when the swing vote is large relative to the core vote, incumbents cannot rely on a base-mobilization strategy and instead must deliver targeted goods to the swing vote.

Finally, under which conditions do incumbents have incentives to maximize the expenditures for public services instead of targeted goods? Those incentives are maximized when the swing vote is at an intermediary size, which also implies an intermediary size of the core vote. In such a situation, incumbents cannot solely rely on either group to win the election. As long as the swing vote does not dominate in its relative size, targeting swing voters is problematic because there is greater uncertainty about their responsiveness (Cox & McCubbins, 1986). Moreover, targeting the swing also means the potential alienation—and thus demobilization—of a party's core voters and vice versa (Chhibber & Nooruddin, 2004, 162). Similarly, delivering extensive targeted goods to both swing and core voters could lead to a strong mobilization effect on opposition voters. Thus, when the swing vote is at

an intermediary size, the incumbent hedges against an uncertain future and broadly invests into public services that benefit both groups diffusely, have the lowest potential to alienate any subset of the population, and could even demobilize opposition voters (Chen, 2013).

To summarize, the goal of incumbents is to maximize their vote share in the next election. Voters are most satisfied when they receive targeted goods, but such targeted benefits often alienate excluded groups and can mobilize the opposition. In general, two main constituencies can be targeted with particularistic benefits: (1) core voters can be mobilized and (2) swing voters can be attracted. If either group is dominant in its relative size and thus electoral relevance, the incumbent party has strong incentives to primarily accommodate this group through transfers and spend less on public services.

When the swing vote is at an intermediary size, however, targeted spending is associated with high political risks, arising from informational asymmetries about responsiveness and the potential alienation of other groups. Consequently, incumbents will increase PSE as they have broad and diffuse positive effects, benefiting all voter groups and not alienating any of them.[1]

Hypothesis 2: The size of the swing vote is the decisive factor influencing PSE. When the swing vote is at an intermediary size, political risks of targeted spending are maximized, leading to the highest level of PSE.

[1]Comparable claims about a curvilinear relationship between presidential approval and responsiveness exist (Canes-Wrone & Shotts, 2004). However, the argument advanced here differs significantly insofar as it relates strategic budget decisions to the observed underlying composition of the electorate into voter groups, which is less prone to be actively shifted by policy than approval ratings.

3 First Empirical Test: US-States Comparison

An empirical test within a single country is a useful first step to evaluate the theory while holding many institutional factors constant. Such a test also allows us to directly measure the size of the swing vote because both the party system and the aggregation of votes are similar across units. The American political system, with elections that are nearly exclusively decided between two parties (Sundquist, 2011, 38), is an ideal setting for such a subnational test because the conventional wisdom is that partisanship is one of the strongest drivers of variations in public services supply there. The alternative theory based on electoral risk should be most difficult to prove here. We use a multivariate regression analysis with panel-corrected standard errors—based on state-year observations—to assess the relationship between the relative size of the swing vote and PSE.

We do not measure the delivery of targeted goods for two primary reasons. First, this paper is focused on explaining variations in PSE. Even though our theory is related to particularistic benefits, too, our key interest are variations in public services supply. Second, other than public services—for which there are common and time-insensitive measurements—targeted goods vary both over time and across regions, making it nearly impossible to find measurements that are consistently valid over multiple decades and for a large number of US states.

3.1 Key Dependent and Independent Variables

The main dependent variables for this test are state government expenditures for health care and primary and secondary education[2] as proportion of total state expenditures (United States Census Bureau, 2017). We use the proportion of the budget as it shows the relative importance that is attributed to this spending category. The data for both variables are available for the years 1961-2008. The expenditure data are inflation-adjusted with the baseline being 2008 dollars (World Bank Group, 2017).

In the context of a competitive two-party system like the US, for both theoretical and practical reasons we can measure the strategic importance of the swing vote directly by its relative size. State-level data from exit polls on the percentage of self-identified independent voters are available. We will use these data to test the swing-voter hypothesis. A squared value of the main independent variable is included as well to allow for curvilinearity. Furthermore, to test the partisanship hypothesis we use data on the number of left-wing core voters (self-identified Democrats) (Larcinese, Snyder, & Testa, 2013). Compared to inferences about the size of voter groups based on voter movements, this is a more precise and accurate measurement.[3]

[2] In order to find the expenditures for primary and secondary education, higher education expenditures were subtracted from total educational expenditures.

[3] People were asked to identify themselves as Republicans, Democrats, or Independents regardless of their vote choice. Even though the data are related to federal elections, the number of self-identified independent is determined by the underlying population of independent voters within the state and thus a sufficiently strong proxy.

3.2 Control Variables

The economic wealth of a state could have a significant impact on the composition of public spending. Accordingly, we use data on state GDP and state population[4] to create a measure of GDP per capita (Bureau of Economic Analysis, 2012; United States Census Bureau, 2017). The measure is inflation-adjusted through inflation data by the World Bank (World Bank Group, 2017).

Moreover, to control for the overall level of political competitiveness within a state, we use data about the closeness of elections, which is a good but imperfect proxy for a state's overall electoral competitiveness.[5]

We also control for government ideology through a measurement that captures the ideological position of different government actors and takes into account the relative power that those actors have (Berry, Fording, Ringquist, Hanson, & Klarner, 2010; Berry, Ringquist, Fording, & Hanson, 1998). An interaction term with the number of left-wing core voters is added.

An important determinant of adjustments in education and health care spending are demographics. Therefore, the proportion of people aged 5-17 will be included in the regressions on primary and secondary education and the proportion of people aged 65 and above will be included in the regressions on health care (CQ Press, 2012).

A table with descriptive summary statistics of the variables is included in the appendix.

The full econometric specification is:

[4]Data on GDP, government ideology, and demographics were obtained through a data collection Website for the American states ((Stateminder, 2016)). The original data sources are cited, too.

[5]Even though this measurement is not ideal as we take it from federal elections within states (Larcinese et al., 2013), it can be seen as a sufficiently strong proxy for a state's overall electoral competitiveness.

$$PSE_{i,t} = \beta_0 + \beta_1 \ Ind. \ (Prop.)_{i,t-1} + \beta_2 \ Ind. \ (Prop.)^2_{i,t-1} + \beta_3 \ Dem. \ (Prop.)_{i,t-1} + \beta_4 \ GDP \ PC_{i,t-1} + \beta_5 \ Gov. \ Ideo._{i,t-1} + \beta_6 \ Gov. \ Ideo. * Dem.(Prop.)_{i,t-1} + \beta_7 \ Closeness_{i,t-1} + \beta_8 \ Pop.Share_{i,t-1} + \varepsilon$$

3.3 Results

We find only mixed evidence with respect to the impact of partisanship on public services expenditures. While there is a positive—but sometimes insignificant—impact on education expenditures, the relationship to health care expenditures is generally negative. At the same time, however, the results provide initial evidence in favor of the electoral-risk hypothesis based on the size of the swing vote.

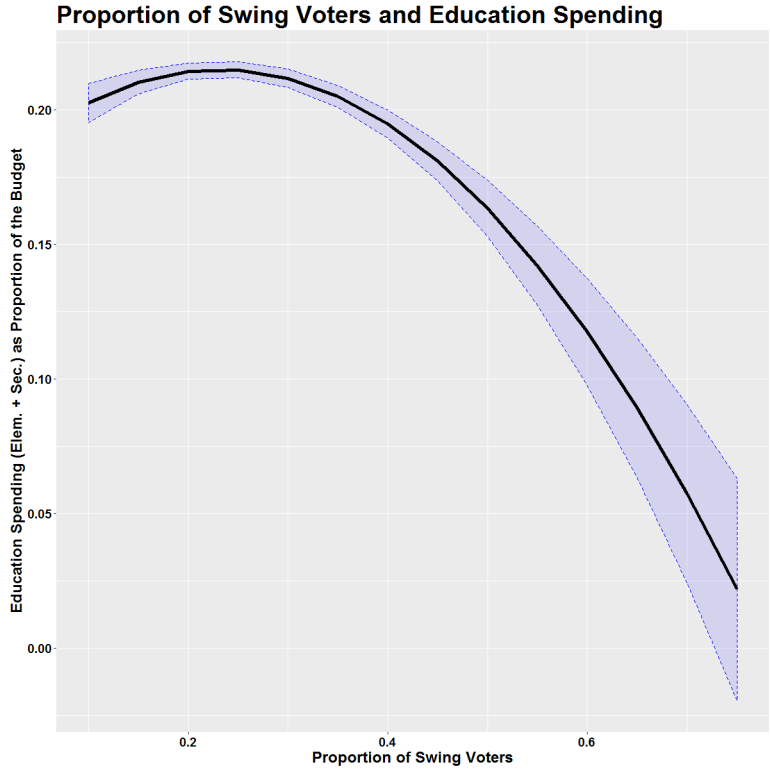
The highest level of expenditures can be observed when the swing vote is at an intermediary size as shown in Figure 1, approximately at 25 percent of the voting population.[6] Further details can be found in Table 1 and Table 2.

Even though in model 6, the regular term of the swing vote proportion is not significant at conventional levels—which is likely related to the much smaller sample size—, in accordance with the theory there is a consistent negative effect of large swing vote sizes on PSE. The fact that the regular term is insignificant does not per se contradict the theory because the highest levels of PSE can still be observed at intermediary sizes of the swing vote. It is only the distinction between low and intermediary levels of the swing vote which is not as pronounced as in the other models.

How would we interpret these findings in light of the theory? At a size of 25 percent of the electorate, the swing vote is a moderate force in deciding the election outcome but

[6] The figure is based on model 2 and contains 90-% confidence intervals.

Figure 1: Proportion of Swing Voters and Education Spending



not completely dominant yet. When making strategic budget decisions, incumbents have to simultaneously accommodate both their core voters and the swing vote without alienating either group. Thus, we observe the highest level of PSE. However, as theoretically expected, when the swing vote grows beyond a moderate size, incumbents clearly lower PSE.

3.4 Discussion

The empirical test provides initial empirical evidence in favor of the electoral-risk theory. However, this evidence is weaker for health care expenditures. At the same time, the impact of partisanship variables remains ambiguous. Most analyses show that PSE are at a maximum when the swing vote is at a moderate size, meaning approximately 25 percent of the voting population.

Table 1: Prim./Sec. Education Expenditures (Prop.) across US States

	Dependent variable:					
	Prim./Sec. Education Expenditures (Prop.)					
	(1)	(2)	(3)	(4)	(5)	(6)
Ind. (Prop.) $_{t-1}$	0.291***	0.334***	0.343***	0.339***	0.329***	0.150
	(0.070)	(0.068)	(0.069)	(0.069)	(0.070)	(0.109)
Ind. Sq. (Prop.) $_{t-1}$	−0.621***	−0.719***	−0.718***	−0.714***	−0.708***	−0.447**
	(0.110)	(0.114)	(0.112)	(0.112)	(0.111)	(0.191)
Dem. (Prop.) $_{t-1}$	0.077***	0.058***	0.073***	0.134***	0.107**	0.137**
	(0.018)	(0.016)	(0.020)	(0.050)	(0.052)	(0.063)
GDP PC $_{t-1}$		−0.001***	−0.001***	−0.001***	−0.002***	−0.001***
		(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Gov. Ideo. $_{t-1}$			−0.0002*	0.0002	0.0001	0.002**
			(0.0001)	(0.0004)	(0.0004)	(0.001)
Gov. Ideo. * Dem. $_{t-1}$				−0.001	−0.001	−0.003**
				(0.001)	(0.001)	(0.002)
Closeness $_{t-1}$					0.028**	0.086***
					(0.013)	(0.012)
Pop. 5-17 (Prop.) $_{t-1}$						1.087***
						(0.100)
Observations	1,318	1,318	1,318	1,318	1,318	460
R^2	0.123	0.194	0.196	0.197	0.201	0.312
Adjusted R^2	0.121	0.191	0.193	0.194	0.197	0.299
Note: PCSE						*p<0.1; **p<0.05; ***p<0.01

The potentially most important concern is that the model could suffer from endogeneity: the level of PSE could have an immediate causal influence on many electoral factors, including the size of the swing vote. However, the dominant view in the discipline is that the causal effect of factors such as PSE on party attachment is negligible (D. P. Green & Palmquist, 1990, 1994; D. P. Green et al., 2004). Moreover, the effect that most public services have on the electorate is a *medium-term* influence, often realized only indirectly through externalities, especially in the case of health care and education (Baum & Lake, 2003). Nevertheless, regression based on observational data can never fully rule out endogeneity. Therefore, it is more appropriate to claim strong evidence in favor of a correlation than of the perfect identification of a causal relationship.

Table 2: Health Care Expenditures (Prop.) across US States

	Dependent variable:					
	Health Care Expenditures (Prop.)					
	(1)	(2)	(3)	(4)	(5)	(6)
Ind. (Prop.) $_{t-1}$	0.238***	0.319***	0.348***	0.350***	0.352***	0.012
	(0.092)	(0.087)	(0.090)	(0.089)	(0.094)	(0.115)
Ind. Sq. (Prop.) $_{t-1}$	−0.695***	−0.881***	−0.877***	−0.879***	−0.880***	−0.424**
	(0.139)	(0.145)	(0.141)	(0.140)	(0.143)	(0.195)
Dem. (Prop.) $_{t-1}$	−0.061*	−0.097***	−0.052	−0.089	−0.083	−0.096
	(0.032)	(0.024)	(0.033)	(0.077)	(0.087)	(0.068)
GDP PC $_{t-1}$		−0.003***	−0.003***	−0.003***	−0.003***	−0.002***
		(0.0003)	(0.0002)	(0.0002)	(0.0002)	(0.0003)
Gov. Ideo. $_{t-1}$			−0.001***	−0.001	−0.001	0.001**
			(0.0002)	(0.001)	(0.001)	(0.001)
Gov. Ideo. * Dem. $_{t-1}$				0.001	0.001	−0.003*
				(0.001)	(0.001)	(0.002)
Closeness $_{t-1}$					−0.006	0.099***
					(0.021)	(0.011)
Pop. 65+ (Prop.) $_{t-1}$						−1.224***
						(0.070)
Observations	1,318	1,318	1,318	1,318	1,318	460
R^2	0.087	0.210	0.221	0.221	0.222	0.408
Adjusted R^2	0.085	0.208	0.218	0.218	0.217	0.397
Note: PCSE						*p<0.1; **p<0.05; ***p<0.01

One might argue that levels of spending are not the ideal measurement for the theory because they are relatively sticky. This concern is valid, but data by the World Bank, scholarly arguments, and graphs in the appendix show that there are enormous variations of PSE within countries over relatively short time periods, meaning that substantial adjustments are possible (Ghobarah, Huth, & Russett, 2004; World Bank Group, 2015).

There are arguments that many self-identified independent voters lean toward one party and are therefore not "true" swing voters (Petrocik, 2009). However, the distribution of independents leaning to either side in the US is relatively symmetric (Mayer, 2008, 24), implying that the overall number of self-identified independents could serve as a reasonable proxy for the raw number of "true" independents.

Finally, the Voting Rights Act of 1965 potentially had effects on education expenditures because it increased the political power of African-American communities who then lobbied for better public education (Cascio & Washington, 2013). Accordingly, we have re-estimated all models for the time period beginning in 1965 and the results hold.

4 Second Empirical Test: Cross-National Analysis

We now evaluate the theory across a large number of countries, especially because issue salience as well as the relationship of party attachment and policy preferences can differ between political systems (Givens & Luedtke, 2005; Milazzo, Adams, & Green, 2012). This makes it potentially more challenging to find consistent results.[7]

A measurement of loss probability (LPR) published in 2015 is a good—though imperfect—measurement of the relative size of swing vote vs. core vote across countries (Kayser & Lindstädt, 2015). LPR is a post-election measurement that reflects the perceived chances of a plurality party in parliament to win or lose its status in the next election. This measurement takes differences in the closeness of contestation and vote aggregation mechanisms into account, which means we indirectly control for those factors and can use it for cross-country comparisons. LPR is determined by two factors: (1) the overall distribution of votes for a newly elected plurality party in parliament[8] and (2) the approximate size of the swing vote. The combination of both makes it ideal as measurement for the *relative strategic importance*

[7]Issue salience could affect governmental responsiveness (Canes-Wrone & De Marchi, 2002). Due to the multitude of indirect positive effects of public services provision outlined above, we would expect the theory to hold for both high-salience and low-salience public services.

[8]This includes the distribution of votes across districts in majoritarian electoral systems, which is important because the geographic dispersion of voter groups across electoral districts could also affect government spending decisions (Rickard, 2012).

and size of voter groups.[9]

Ceteris paribus, plurality parties have lower LPR when their general electoral support as measured by their vote share is higher. A high level of electoral support could be associated with a large core constituency, but we need to further account for the size of the swing vote. Thus, the vote volatility in previous elections is used as proxy for the number of swing voters (Kayser & Lindstädt, 2015). Holding all other factors constant, as the size of the swing vote increases, the probability of parties to lose plurality status increases because the potential for significant vote swings becomes larger. This means that higher levels of LPR represent a larger relative size of the swing vote and lower levels of LPR represent a smaller relative size of the swing vote, accounting for both the vote aggregation mechanism and the closeness of elections. Therefore, LPR represents a good proxy for the *context-specific electoral importance of the swing vote*. LPR theoretically ranges from 0 to 1. The empirical maximum of 0.75 is observed for Australia in 2001.[10] We take several steps to address the fact that the data refer to the plurality party in parliament, which might be problematic in presidential system: first, we control for presidentialism. Second, as discussed below, we also re-estimate all models without the US (the main presidential system in the dataset).

The empirical test will be a cross-sectional time-series linear regression with panel-corrected standard errors. It is based on country-year observations and analyzes levels of PSE standardized by either GDP or the number of students and GDP per capita. Several

[9] Although we use this measurement by Kayser and Lindstädt to test our theory, it differs significantly from theirs. Our theory is primarily concerned with the *underlying* concept of the relative strategic importance of different voter groups and how it affects distributional choices of incumbents.

[10] Following the example by the creators of the dataset, the simplifying assumption will be introduced that LPR remains constant for the electoral cycle. This simplifying assumption is in accordance with the real practice of many governments as coalition partners generally agree on their strategic budget decisions at the beginning of an electoral term.

control variables that capture other theories about the determinants of PSE are included and will be discussed below. The universe of cases covered is a subset of OECD countries in all statistical tests as LPR is also limited to those. For a list of all units, please see the appendix.

4.1 Key Dependent and Independent Variables

As elaborated in section 2, we are primarily concerned with cross-national variation in the level of PSE for education and health care. Specifically, (1) public expenditures for primary and secondary education per student as percentage of GDP per capita and (2) public expenditures for health care as percentage of GDP. Data on expenditures for these two public services is available for most OECD countries but for a very limited time period in which LPR is also available, which is from 1999 to 2010 in the case of education expenditures and from 1996 to 2010 in the case of health care spending (World Bank Group, 2015).

As discussed above, LPR is used to measure the context-specific electoral relevance of the swing vote (Kayser & Lindstädt, 2015). A squared value of the main independent variable is included as well to allow for curvilinearity.

Additionally, in order to test the partisanship hypothesis, which is based on the electoral support that left-wing parties receive, we measure the government cabinet share of left-wing parties (Armingeon, Knöpfel, Engler, Potolidis, & Gerber, 2013).

4.2 Control Variables

We control for government tax revenue as percentage of GDP for two reasons. First, the level of taxation could influence the interest of voters in the quality of public services (A. Persson & Rothstein, 2015). Second, we need to account for the significant cross-national differences in government tax capacities (World Bank Group, 2015).

Furthermore, several political and institutional factors may affect the level of public services spending according to the political-economic literature.[11] For example, presidential systems may lead to the redistribution of resources towards a minority, implying lower levels of public services supply (T. Persson, Roland, & Tabellini, 2000).

Additionally, federal systems can have decisive influence on economic policies (Wibbels, 2000), in part because state governments may have partial control over PSE.[12] However, even in federal systems we may find strong party-linkages across the state and central governments, meaning that local actors have incentives to act in accordance with party interests on the federal level (Cox, 1999).

Electoral systems have a potential impact on government spending decisions: proportional representation (PR) systems have been found to be more prone to transfer spending while majoritarian systems are more prone to supply local public services (Milesi-Ferretti, Perotti, & Rostagno, 2002). Alternatively, majoritarian institutions may lead to underinvestment in public goods (Leblanc, Snyder Jr, & Tripathi, 2000). Thus, we control for different

[11] The *Comparative Political Dataset* (CPDS) (Armingeon et al., 2013) offers indicators on institutional factors and the ideological composition of governments amongst others. If not stated otherwise, the control variables of the cross-country analysis are taken from this dataset.

[12] The data that we use to control for this factor has three levels, (1) no federalism, (2) weak federalism, and (3) strong federalism.

types of electoral systems.[13]

Moreover, voter turnout in an election could heavily affect both competitiveness and the provision of public services. In countries with high turnout, the provision of public services may be permanently higher as the "selectorate" can be considered larger (Bueno de Mesquita et al., 2001; Bueno De Mesquita & Smith, 2005; Lizzeri & Persico, 2004).

The number of parties could also have a crucial impact on the level of public services provision. In a two-party system higher PSE may be expected because parties have incentives to attract large parts of the population (Chhibber & Nooruddin, 2004). Thus, we will use the level of legislative fractionalization as control variable. Finally, we also control for the share of right-wing parties in government, with the share of centrist parties being the omitted category.

A table with descriptive summary statistics and the results of the empirical test with health expenditures as dependent variable are both included in the appendix.

The full econometric specification is:

$$PSE_{i,t} = \beta_0 + \beta_1\ LPR_{i,t-1} + \beta_2\ LPR^2_{i,t-1} + \beta_3\ Left\ Gov._{i,t-1} + \beta_4\ Tax\ Rev._{i,t} + \beta_5\ Presid._{i,t-1} + \beta_6\ Fed._{i,t-1} + \beta_7\ Elec.\ Sys._{i,t-1} + \beta_8\ V.\ Turnout_{i,t-1} + \beta_9\ Leg.\ Fract._{i,t-1} + \beta_{10}\ Right\ Gov._{i,t-1} + \varepsilon$$

4.3 Results

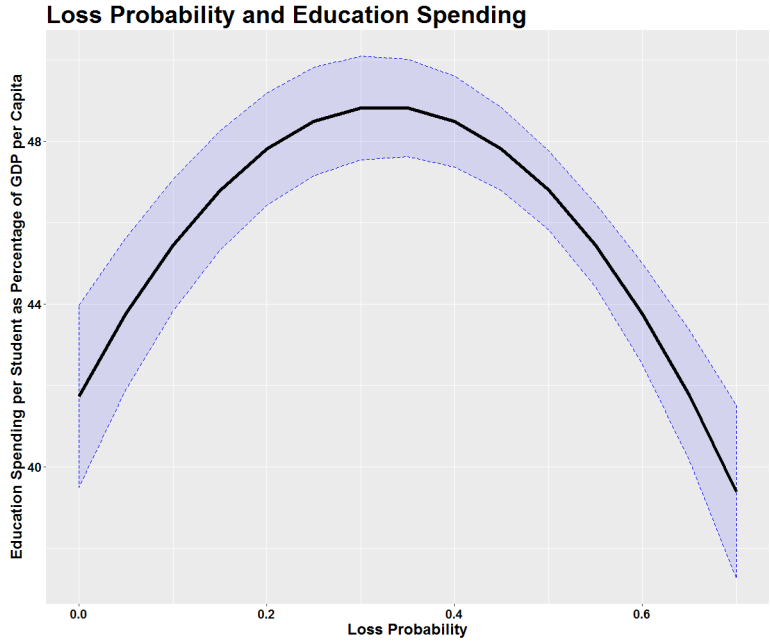
We again find only mixed evidence for the partisanship hypothesis. While left-wing presence in government appears to be strongly correlated with the level of educational expenditures, it

[13]The variable utilized has three categories, namely (1) PR, (2) modified PR, and (3) single-member, simple plurality systems.

appears to be only very weakly related to the level of health care expenditures. On the other hand, we find strong evidence in favor of the second hypothesis derived from the electoral-risk theory.

The relative size of the swing vote as measured by LPR is strongly correlated with the level of public services expenditures in terms of both education and health care. The curvilinear form of this relationship is clearly visible in Figure 2, with the maximum of PSE at an LPR value of approximately 0.33 to 0.36.[14] See Table 3 and the table in the appendix for more details.

Figure 2: Loss Probability and Education Spending



What does it mean substantively that the observed maximum of public services spending is at a loss probability of approximately 0.33 to 0.36? Let us compare it to a very low LPR value like 0.05. An LPR of 0.05 indicates that a plurality party has such strong electoral support that voter movements will lead to a loss of its plurality status in only 5 percent of the

[14]The figure is based on model 2 and contains 90-% confidence intervals.

cases. This means that the swing vote is small relative to the size of the core support that the incumbent enjoys. Under such circumstances it is an efficient strategy for the incumbent to focus on mobilizing its core through particularistic benefits to win the upcoming election, resulting in the observed low level of PSE.

An LPR of 0.33 to 0.36, however, indicates that the swing vote is at a moderate size, meaning that movements of the swing vote threaten its plurality position in about one third of the cases. In this situation, it is no longer a viable strategy for the incumbent to solely focus on the core vote to win the upcoming election. Considering that the swing vote could be alienated by excessive spending on the core, it becomes important to allocate resources in a way that the swing vote also benefits, resulting in higher PSE. This expectation is confirmed empirically. In accordance with the theory, at even higher levels of LPR, the incumbent again has incentives to reduce PSE.

4.4 Discussion

While we again find only mixed evidence in favor of the view that partisanship has a strong effect on the level of PSE, the results of the cross-national analysis provide further evidence in favor of the electoral-risk hypothesis. However, variations in data reliability, culture, perceptions, and a multitude of other factors mean that cross-country comparisons can give us a rough idea about an association between variables but we need to acknowledge the weaknesses (Levine & Zervos, 1993).

It has been shown that the outcome of studies of distributive politics is heavily affected by the choice of the dependent variable and that there is the danger for scholars to arbitrarily

Table 3: Education Expenditures across Countries

	Dependent variable:			
	Education Exp. per Student (Pct. of GDP PC)			
	(1)	(2)	(3)	(4)
LPR $_{t-1}$	42.283***	43.850***	50.742***	54.008***
	(7.475)	(6.951)	(8.330)	(9.922)
LPR Sq. $_{t-1}$	−68.701***	−67.434***	−83.175***	−89.913***
	(11.262)	(10.179)	(13.947)	(17.068)
Left Gov. $_{t-1}$	0.040***	0.036***	0.054***	0.075***
	(0.011)	(0.011)	(0.014)	(0.024)
Tax Rev. $_{t-1}$		0.228***	0.470***	0.320**
		(0.066)	(0.129)	(0.142)
Presid. $_{t-1}$			3.317***	2.532*
			(0.869)	(1.485)
Federal. $_{t-1}$			2.722***	2.579***
			(0.930)	(0.932)
Elec. Sys. $_{t-1}$			−3.278***	−2.728***
			(0.511)	(0.953)
V. Turnout $_{t-1}$				0.036
				(0.071)
Legisl. Fract. $_{t-1}$				0.043
				(0.068)
Right Gov. $_{t-1}$				0.032
				(0.022)
Observations	189	183	183	183
R^2	0.163	0.186	0.279	0.288
Adjusted R^2	0.150	0.168	0.250	0.246
Note: PCSE				*p<0.1; **p<0.05; ***p<0.01

and opportunistically choose the dependent variables that confirm their theory (Kramon & Posner, 2013). Therefore, further tests using data on environmental spending by the IMF as dependent variable also confirm the theory (International Monetary Fund, 2015). Like the results on health care expenditures, they are included in the appendix.

Finally, the US is very different from the other countries in the sample as it has both a majoritarian and a presidential system. Therefore, we have removed the US from the sample and re-estimated all models. The coefficients of both LPR and LPR^2 keep the right direction and even though their statistical significance is slightly reduced in a few cases, it remains at $p < 0.05$ in the full econometric specification.

5 Conclusion

What is the effect of electoral competition on the provision of public services? This paper highlights an essential factor that has mostly been neglected by the literature on public services—the internal composition of the electorate in terms of core, swing, and opposition voters. A conventional argument that can be derived from parts of the established literature on partisanship and macroeconomic policies is that the electoral support left-wing parties receive should be decisive in terms of the level of public services supply. We find only mixed evidence in favor of this view.

Instead, we find strong and consistent support for the theory based on electoral risk introduced earlier. We argue that the relative size of the swing vote decides to which extent parties can win elections by core voter mobilization through targeted goods. When the swing vote is at an intermediary size, the transfer of particularistic benefits is associated with high political risks because of uncertainty about voter responsiveness, the potential alienation of excluded groups, and the possible mobilization of opposition voters. Therefore, we expected the highest level of public services supply under such circumstances—as a means to hedge against electoral uncertainty, benefit all voter groups simultaneously, and demobilize opposition voters. This expectation was confirmed empirically through two sets of empirical tests with multiple public services as dependent variables. While this paper does not reach the experimental ideal, the consistent significance of the observed correlation across different contexts and measurements provides strong support for the theory at hand.

The most important contribution of this paper is that it bridges the gap between arguments in two debates. The core versus swing voter literature is characterized by disagreement

over whether governments target core or swing voters. This paper argues that their choice is contingent on the size and thus electoral relevance of those subgroups of the electorate. Furthermore, disagreements over the effects of electoral competition on supplying public services are also addressed here—we argue that the extent of PSE in democracies is subject to the strategic electoral relevance of voter groups. In short, this paper provides a unique perspective on public services supply by utilizing and building upon insights from the core versus swing voter literature.

This analysis also has limitations that could be addressed in future research. For instance, more refined measurements of electoral groups could be used to go beyond the core-swing-opposition voter classification. Furthermore, potential asymmetries of the effects of public expenditures (across regions or subgroups of the electorate) are avenues for additional research. Even though the theory will require further confirmation and more refined empirical tests in the future, we can now better explain some of the significant variation in public service expenditures across the advanced democracies.

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6 Appendix

6.1 Public Services Expenditures Across Countries

Figure 3 and Figure 4 graphically illustrate the significant variation of education expenditures and health care expenditures across and within OECD countries that has motivated this paper.

Figure 3: Public Education Expenditures Across Countries

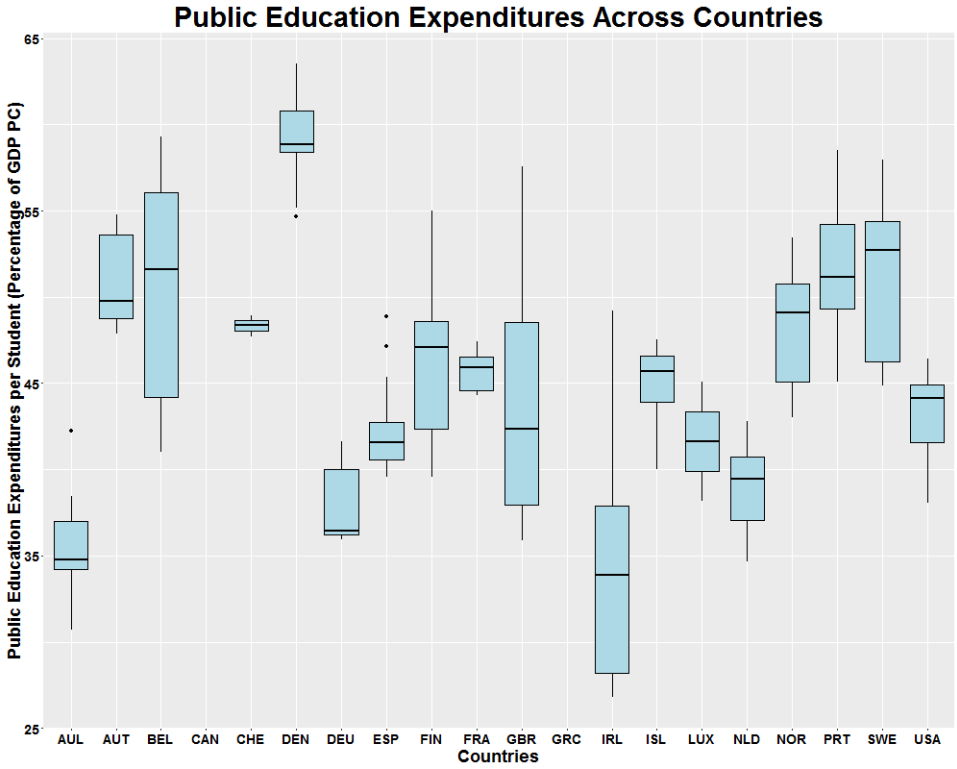
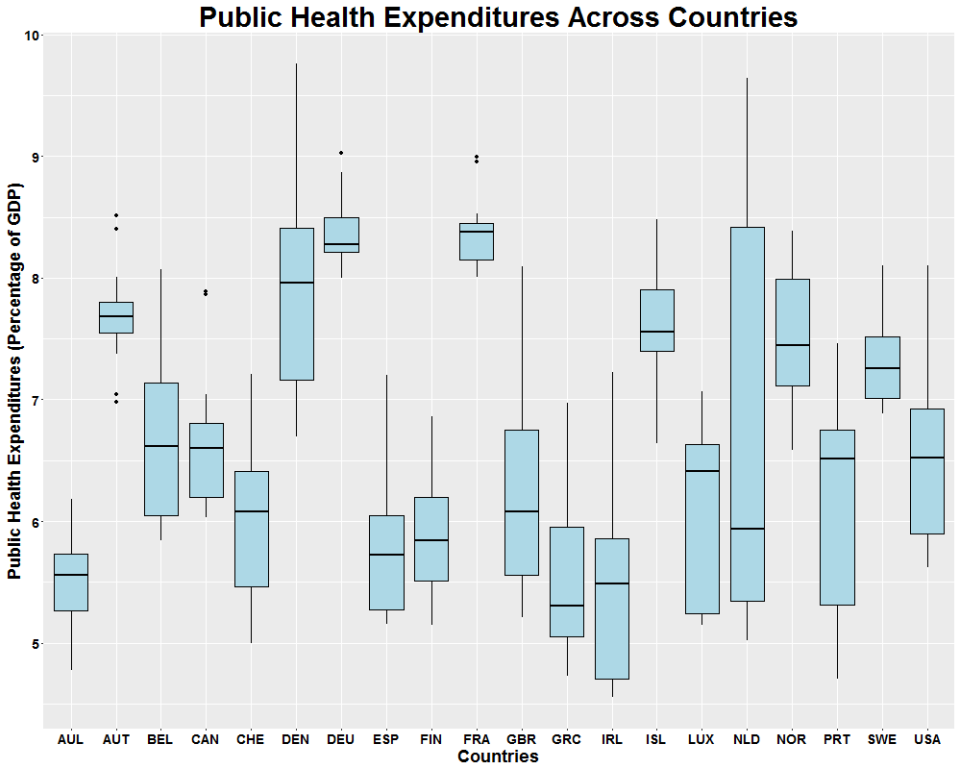


Figure 4: Public Health Expenditures Across Countries



6.2 First Empirical Test: Summary Statistics

Table 4 shows descriptive summary statistics of the variables used in the first empirical test.

Variable	**n**	**Min**	$\mathbf{q_1}$	$\bar{\mathbf{x}}$	$\tilde{\mathbf{x}}$	$\mathbf{q_3}$	**Max**	**IQR**
Prim./Sec. Educ. Exp. (Prop.)	2400	0.04	0.17	0.20	0.21	0.24	0.40	0.07
Health Care Exp. (Prop.)	2400	0.11	0.29	0.33	0.33	0.38	0.52	0.09
Independents (Prop.)	1318	0.09	0.22	0.28	0.27	0.33	0.75	0.11
Democrats (Prop.)	1318	0.00	0.34	0.39	0.38	0.44	0.61	0.10
GDP PC (2008 USD, '000)	2300	10.56	22.39	30.48	28.49	37.45	106.79	15.06
Government Ideology	2450	23.64	45.59	52.97	53.12	61.90	79.16	16.31
Closeness	1702	0.40	0.78	0.84	0.87	0.93	1.00	0.15
Population Aged 5-17 (Prop.)	700	0.15	0.17	0.18	0.18	0.19	0.25	0.02
Population Aged 65+ (Prop.)	700	0.05	0.12	0.13	0.13	0.14	0.19	0.02

Table 4: Descriptive Statistics: US-States Comparison

6.3 First Empirical Test: US States

A list of all American states that are included in the second empirical test follows.

	Education Expenditures	Health Care Expenditures
1	AL	AL
2	AR	AR
3	AZ	AZ
4	CA	CA
5	CO	CO
6	CT	CT
7	DE	DE
8	FL	FL
9	GA	GA
10	IA	IA
11	ID	ID
12	IL	IL
13	IN	IN
14	KS	KS
15	KY	KY
16	LA	LA
17	MA	MA
18	MD	MD
19	ME	ME
20	MI	MI
21	MN	MN
22	MO	MO
23	MS	MS
24	MT	MT
25	NC	NC
26	ND	ND
27	NE	NE
28	NH	NH
29	NJ	NJ
30	NM	NM
31	NV	NV
32	NY	NY
33	OH	OH
34	OK	OK
35	OR	OR
36	PA	PA
37	RI	RI
38	SC	SC
39	SD	SD
40	TN	TN
41	TX	TX
42	UT	UT
43	VA	VA
44	VT	VT
45	WA	WA
46	WI	WI
47	WV	WV
48	WY	WY

6.4 Second Empirical Test: Summary Statistics

Table 5 shows descriptive summary statistics of the variables used in the second empirical test.

Variable	**n**	**Min**	$\mathbf{q_1}$	$\bar{\mathbf{x}}$	$\tilde{\mathbf{x}}$	$\mathbf{q_3}$	**Max**	**IQR**
Educ. Exp. per Student (% of GDP PC)	189	26.82	40.99	45.69	45.87	49.81	63.50	8.82
Health Care Expenditures (% of GDP)	319	4.56	5.74	6.70	6.69	7.62	9.76	1.88
LPR	700	0.00	0.03	0.24	0.20	0.41	0.75	0.38
Left Government	700	0.00	0.00	36.50	28.57	65.14	100.00	65.14
Tax Revenue	274	8.21	18.12	20.65	21.13	24.78	34.88	6.66
Presidentialism	700	0.00	0.00	0.19	0.00	0.00	1.00	0.00
Federalism	700	0.00	0.00	0.64	0.00	2.00	2.00	2.00
Electoral System	700	0.00	0.00	0.42	0.00	1.00	2.00	1.00
Voter Turnout	700	35.00	69.30	77.02	80.15	88.40	95.80	19.10
Legislative Fractionalization	700	40.91	59.16	68.72	70.65	78.07	88.98	18.91
Right Government	700	0.00	0.00	35.69	25.00	57.14	100.00	57.14

Table 5: Descriptive Statistics: Cross-National Analysis

6.5 Second Empirical Test: Countries

A list of all countries that are included in the second empirical test follows.

	Education Expenditures	Health Care Expenditures
1	Australia	Australia
2	Austria	Austria
3	Belgium	Belgium
4	Denmark	Canada
5	Finland	Denmark
6	France	Finland
7	Germany	France
8	Iceland	Germany
9	Ireland	Greece
10	Luxembourg	Iceland
11	Netherlands	Ireland
12	Norway	Luxembourg
13	Portugal	Netherlands
14	Spain	Norway
15	Sweden	Portugal
16	Switzerland	Spain
17	United Kingdom	Sweden
18	United States	Switzerland
19		United Kingdom
20		United States

6.6 Second Empirical Test: Health Care Expenditures

Table 6 shows the results of the empirical test with respect to health care expenditures.

Table 6: Health Expenditures across Countries

	Dependent variable:			
	Health Care Exp. (Pct. of GDP)			
	(1)	(2)	(3)	(4)
LPR $_{t-1}$	1.026	1.422*	1.559**	1.797**
	(0.780)	(0.752)	(0.748)	(0.747)
LPR Sq. $_{t-1}$	−2.113**	−2.677***	−3.043***	−3.699***
	(1.015)	(0.991)	(1.050)	(1.042)
Left Gov. $_{t-1}$	−0.002	−0.002	−0.001	−0.0001
	(0.001)	(0.001)	(0.002)	(0.002)
Tax Rev. $_{t-1}$		−0.008	0.016	−0.056***
		(0.009)	(0.013)	(0.016)
Presid. $_{t-1}$			0.577***	0.836***
			(0.178)	(0.236)
Federalism $_{t-1}$			0.176**	−0.127
			(0.077)	(0.077)
Elec. Sys. $_{t-1}$			−0.146***	0.389***
			(0.024)	(0.060)
V. Turnout $_{t-1}$				0.034***
				(0.007)
Legisl. Fract. $_{t-1}$				0.041***
				(0.005)
Right Gov. $_{t-1}$				0.001
				(0.002)
Observations	318	271	271	271
R^2	0.012	0.019	0.049	0.174
Adjusted R^2	0.003	0.004	0.024	0.143
Note: PCSE				*p<0.1; **p<0.05; ***p<0.01

6.7 Additional Empirical Analysis: Environmental Protection Expenditures

In this section, we address criticism that the choice of the dependent variable is often made deliberately to confirm a theory.(Kramon & Posner, 2013) Even though we have chosen two types of public services systematically and demonstrated that the suggested relationship holds across different contexts, we use this section to measure the relationship with a third public service—environmental spending. Data on cross-national environmental protection expenditures were provided by the IMF.(International Monetary Fund, 2015) The key independent and control variables are the same as in section 4. The results provide further evidence in favor of the theory. All details can be found in Table 7.

Table 7: Environmental Protection Expenditures across Countries

	Dependent variable:			
	Environmental Protection Expenditures (Percent of GDP)			
	(1)	(2)	(3)	(4)
LPR $_{t-1}$	0.123	0.138*	0.144*	0.213**
	(0.082)	(0.078)	(0.074)	(0.088)
LPR Sq. $_{t-1}$	−0.521***	−0.524***	−0.573***	−0.703***
	(0.115)	(0.109)	(0.117)	(0.149)
Left Gov. $_{t-1}$	−0.001***	−0.001***	−0.001***	−0.00004
	(0.0002)	(0.0002)	(0.0002)	(0.0003)
Tax Rev. $_{t-1}$		0.006***	0.004**	0.003
		(0.001)	(0.002)	(0.002)
Presid. $_{t-1}$			−0.025	−0.085***
			(0.027)	(0.029)
Federalism $_{t-1}$			−0.0005	0.020
			(0.011)	(0.012)
Elec. Sys. $_{t-1}$			0.029*	0.036**
			(0.016)	(0.016)
V. Turnout $_{t-1}$				−0.001
				(0.0005)
Legisl. Fract. $_{t-1}$				0.002*
				(0.001)
Right Gov. $_{t-1}$				0.001***
				(0.0003)
Observations	187	176	176	176
R^2	0.218	0.318	0.340	0.377
Adjusted R^2	0.205	0.302	0.313	0.340

Note: PCSE *p<0.1; **p<0.05; ***p<0.01