doi:10.1017/S0003055410000262

Political Polarization and the Size of Government

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In this article, we study the relationship between political polarization and public spending using the dispersion of self-reported political preferences as our measure of polarization. Political polarization is strongly associated with smaller government in democratic countries, but there is no relationship between polarization and the size of government in undemocratic countries. The results are robust to a large set of control variables, including gross domestic product per capita and income inequality.

Countries differ widely in the extent to which they rely on the government to allocate resources, goods, and services. For example, government consumption in the year 2000 amounted to 34.3% of total consumption in Sweden as compared to 17.6% in the United States (Gwartney and Lawson 2008). Such large differences in government size are hard to reconcile with the standard political economy model of redistribution (Meltzer and Richard 1981), where the size of government is determined by the economic interest of the median voter.[1] However, more recent research in economics and political science has suggested that the size of government is also determined by the dispersion or polarization of political preferences.

For example, polarization can affect political decision making within governments and legislatures. Veto player theory (Tsebelis 2002) predicts fewer changes in the budget in countries where the government consists of several parties and the ideological distance between parties is large. Alesina, Baqir, and Easterly (1999) show that disagreement about the appropriate use of public spending leads to lower spending if the size of the budget is decided before its composition. Following Alesina and Tabellini (1990) and Persson and Svensson (1989), there are several articles that study the incentives of incumbent governments to limit future governments' ability to tax and spend. Depending on the specific assumptions, this type of explanation can rationalize both negative (e.g., Svensson 1998) and positive (e.g., Azzimonti n.d.) relationships between polarization and size of government. Furthermore, polarization could lead to conflicts of interest among the poor that affect their ability to form coalitions for increased redistribution (Fernández and Levy 2008). Polarization might also be more directly related to preferences for redistribution. Similarity of attitudes and opinions has been shown to be positively related to altruism (e.g., Byrne 1961; Newcomb 1961) and, therefore, potentially also to higher support for redistribution.

So far, empirical work on political polarization and economic outcomes has used indirect measures of political preferences based on income, ethnicity, or religion.[2] However, if political views do not follow straight from economic self-interest or group identification, polarization in terms of income, ethnicity, or religious beliefs may not fully capture the true level of political polarization.[3] In this article, we instead derive measures of political polarization based on voters' self-reported political preferences. We then test whether these measures can explain differences in the size of government across countries.[4] Although it is unclear

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Previous versions of this article have been published in the authors' dissertations—see Lindqvist (2007) and Östling (2008). We thank Alberto Alesina, Martin Bech Holte, Roberta Dessi, Mikael Elinder, Tore Ellingsen, Justina Fischer, Olle Folke, Christina Fong, Ola Granström, Magnus Johannesson, Henrik Jordahl, Ethan Kaplan, Torsten Persson, Daniel N. Posner, Paul Seabright, Jean Tirole, and Björn Tyrefors; the coeditors of the *American Political Science Review*; three anonymous referees; and seminar participants at the ENTER Jamboree 2007 in Mannheim, the Research Institute of Industrial Economics (Stockholm), the 2006 Ratio Colloquium for Young Social Scientists, Stockholm School of Economics, and Uppsala University for encouragement and valuable comments. We are grateful to Carles Boix, Alexander Downes, and Torsten Persson for providing data; Aron Berg and Selva Baziki for research assistance; Christina Lönnblad for editorial assistance; and Jan Wallander's and Tom Hedelius' Research Foundation for financial support.

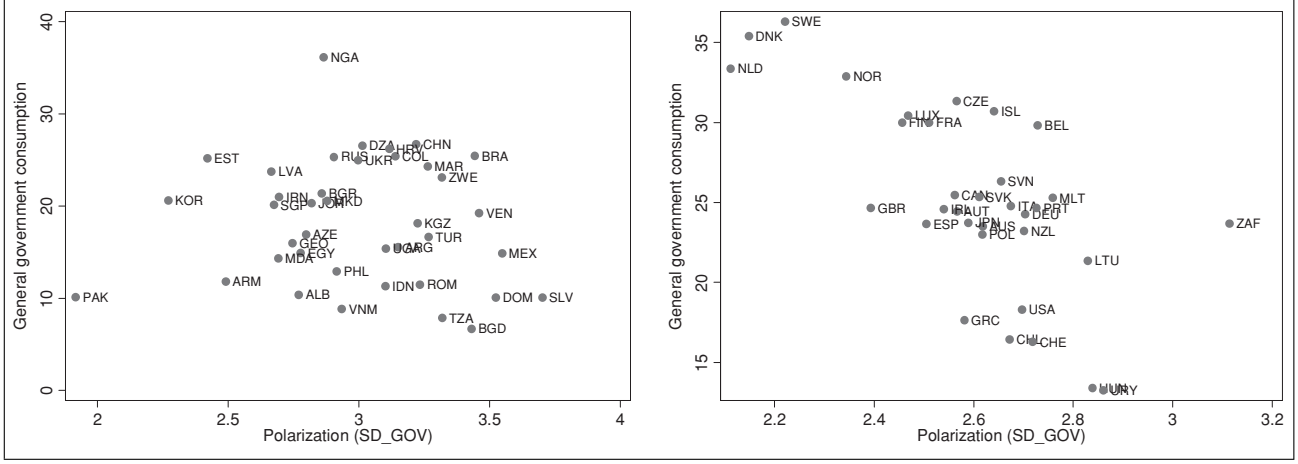
[1] Previous literature has considered many other potential determinants of the size of government. Electoral rules (e.g., Iversen and Soskice 2006; Persson and Tabellini 2003), social insurance (Moene and Wallerstein 2001), country size (Alesina and Wacziarg 1998), and openness to international trade (Rodrik 1998) are just a few examples.

[2] For example, ethnic diversity is associated with smaller size and lower quality of government (e.g., Alesina, Baqir, and Easterly 1999; Alesina, Glaeser, and Sacerdote 2001; Alesina and Zhuravskaya 2008; Luttmer 2001; Vigdor 2004). Another line of research has focused on the polarization of political parties and various economic outcomes (e.g., Alt and Dreyer Lassen 2006; Cukierman, Edwards, and Tabellini 1992; Frye 2002; Svensson 1998).

[3] See Shayo (2009) for a model of how group identification may affect political preferences.

[4] To the best of our knowledge, we are the first to test the effect of polarization on the size of government using direct measures of political preferences. We are not the first, however, to study the dispersion of responses to multiple-choice questions at the country level. DiMaggio, Evans, and Bryson (1996) use survey data to study changes in dispersion and polarization of attitudes over time. Au (1999) and Au and Cheung (2004) study how variation in job characteristics affects certain social outcomes, such as job satisfaction. There is also a literature within social psychology on the determinants of value consensus (e.g., Shalom and Sagie 2000). See also Gerber

FIGURE 1. General Government Consumption and Polarization (Standard Deviation of Government Responsibility Question) in Weak (*left*) and Strong (*right*) Democracies



from a theoretical perspective whether the net effect of polarization on the size of government is positive or negative, our measures of political polarization based on survey data are strongly negatively related to the level of public spending.

Do these relationships reflect a causal effect of polarization on government size? An alternative explanation is that political polarization is instead affected by the size of government. As a simple test of the direction of causality, we divide the sample according to the level of democratic development. The idea is that voters must have a say in the political process for polarization in the electorate to affect spending decisions. Political polarization may be affected by government policies, but it is not obvious why this should depend on the level of democratic development. We find that the relationship between polarization and size of government is substantially stronger in democratic countries, supporting the view that polarization affects public spending rather than the other way around.

Figure 1 shows the relationship between one of our polarization measures (the standard deviation of responses to a question about government vs. individual responsibility) and government consumption as a fraction of total consumption for countries that are classified as "weak" or "strong" democracies, respectively. The correlation between polarization and size of government is clearly much stronger for strong democracies. Moreover, Figure 1 shows that the relationship is not driven by extreme values in a few countries.

The pattern in Figure 1 is suggestive, but it does not allow us to conclude that political polarization causes smaller government. There are three specific problems associated with testing the effect of polarization on the size of government that we address. First, our measure of political polarization may be correlated with some other factor that in turn affects size of government. For example, polarization is higher in countries that either are poor, are ethnically fragmented, or have a low level of trust. We show that our measure of political polarization remains a robust predictor of size of government when controlling for these factors, as well as a wide range of other variables.

Second, standard political economy models of redistribution (e.g., Meltzer and Richard 1981) predict that political polarization is increasing in income inequality. If government spending affects income inequality, for example, by improving labor market opportunities for the poor, then this would give rise to an endogeneity problem (i.e., that political polarization is itself a function of the size of government). However, our results are robust to controlling for income inequality and using polarization measures that adjust for the distribution of income within countries.

Third, our measure of polarization may reflect uncertainty as to how to answer survey questions rather than genuine disagreement over economic policy. For example, it is conceivable that certain types of public spending (e.g., schooling) reduce the uncertainty respondents feel about how to respond to survey questions, thereby creating a spurious link between government size and political polarization. Our main test for this possibility is to calculate a measure of "ideological coherence"—the extent to which answers to questions of economic policy follow a certain pattern—and then use this measure as a control variable. We also perform additional robustness checks related to our use of survey data, but none of these tests change our results appreciably.

Having established that there exists a strong, robust correlation—and perhaps also a causal relationship—between political polarization and public spending, we devote the last section of the article to the question of *why* this relationship exists. Surprisingly, we do not find that countries with high levels of polarization among the electorate have more fragmented legislatures or governments in terms of the number and relative size of

and Lewis (2004), who calculated a measure of heterogeneity in voter preferences from voting records and showed that legislators were more constrained by the preferences of the median voter in homogeneous districts.

TABLE 1. Economic Policy Questions

EQUALITY	How would you place your views on this scale? 1 means that you completely agree with the statement, "Incomes should be made more equal," and 10 means that you completely agree with the statement, "We need larger income differences as incentives."
PRIVATE	How would you place your views on this scale? 1 means that you completely agree with the statement, "Private ownership of business should be increased," and 10 means that you completely agree with the statement, "Government ownership of business and industry should be increased."
GOV	How would you place your views on this scale? 1 means that you completely agree with the statement, "People should take more responsibility to provide for themselves," and 10 means that you completely agree with the statement, "The government should take more responsibility to ensure that everyone is provided for."
COMP	How would you place your views on this scale? 1 means that you completely agree with the statement, "Competition is good. It stimulates people to work hard and develop new ideas," and 10 means that you completely agree with the statement, "Competition is harmful. It brings out the worst in people."

The wording of the questions has been slightly abbreviated.

political parties. We do, however, find that the average level of polarization among the supporters of different political parties is higher in polarized countries. For example, the U.S. Congress is much more concentrated than the Swedish seven-party parliament in terms of the number of political parties, but the level of polarization is larger among the supporters of both the Democratic Party and Republican Party than within the entire Swedish electorate.

As a further test of why polarization is related to government size, we calculate the level of polarization among respondents who support a party in government and among supporters of opposition parties. Although there are several reasons to expect polarization among government supporters to affect size of government, it is not clear that polarization among supporters of the opposition should have a direct effect on size of government. We indeed find that polarization among government supporters is a stronger predictor of size of government than polarization among opposition supporters. We also find that the relationship between political polarization in the electorate and size of government is substantially stronger in democracies with fragmented governments or legislatures. This result is consistent with veto player theory (Tsebelis 2002); spending proposals are more likely to be vetoed when there are several parties that disagree about the proper course of action.

Our results should be interpreted with some caution. The association between political polarization and size of government is robust, but much work remains before we can establish whether this correlation reflects a causal effect of polarization on public spending and, if so, which is the main mechanism behind this relationship.

Before proceeding to the empirical analysis, we describe our measures of polarization and the outcome and control variables. Data sources and definitions of variables are provided in Appendix A. All empirical results not provided in the text are available online in a Supplementary Appendix, which is available at http://www.journals.cambridge.org/psr2010005.

DATA

Political Polarization

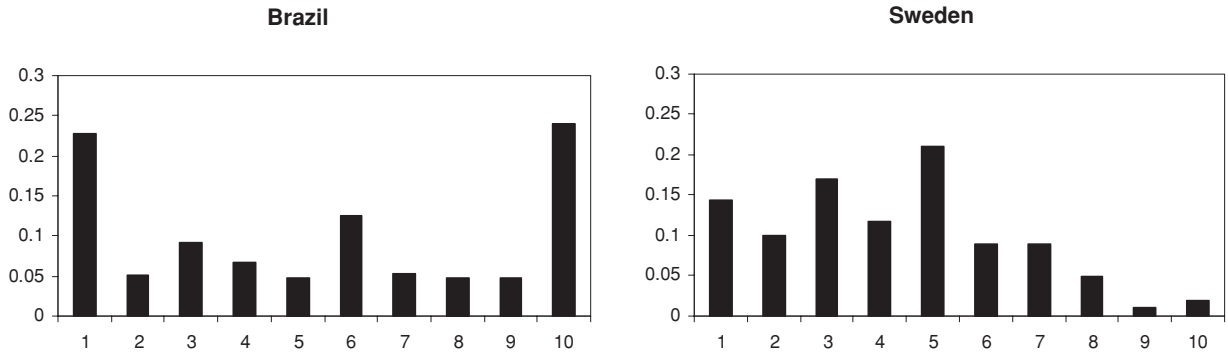
We base our measures of polarization on responses to multiple-choice questions from the World Values Surveys (WVS) (European Values Study Group and World Values Association 2006). We focus on the 2000 wave for most countries, but data from the 1995 wave are used for some countries so as to increase the sample size. The WVS is based on face-to-face interviews with about 1,000 respondents in 83 different countries, but 9 of these are not included in our analysis.[5] The included countries and the year when the survey was carried out are listed in Table A1 of Appendix A.

We consider four questions that, broadly speaking, measure various economic aspects of left and right on a 1-to-10 scale.[6] Table 1 displays the wording of each question. Two things are worth noting about the way

[5] We excluded three countries (Northern Ireland, Puerto Rico, Taiwan) because they were not included as separate entities in the other data sources, and four other countries (Serbia and Montenegro, Iraq, Belarus, Saudi Arabia) because government size data were unavailable. In addition, we excluded two countries (Israel and India) because fewer response alternatives were used in these countries.

[6] There are other questions in the WVS that might also be relevant, but these four questions satisfy a number of criteria (more than two response alternatives, sufficiently many observations, and not too high correlation between the mean and standard deviation) that we used in a previous version of this article. We considered using an index combining all economic policy questions instead of reporting the results for the four questions separately. However, we abstained from doing so primarily because there would be fewer observations for this index than for any single question. Moreover, the results for

FIGURE 2. Histogram of Responses to GOV Question in Brazil and Sweden



the questions are formulated. First, the questions capture preferences for the size of government rather than the focus of public spending (with the question about competition as a possible exception). Second, all but the competition question ask whether the government should be larger or smaller than the status quo in each country. We return to these issues in what follows.

To compare the level of polarization across countries in a systematic way, we use the standard deviation as our main measure of polarization. The standard deviation is perhaps the most common measure of dispersion and has the advantage of being simple and transparent. A property of the standard deviation is that it does not depend on whether answers are clustered in distinct groups. In this sense, it is a measure of "dispersion" as much as "polarization." To see why this may be important, consider the histogram of responses for the government responsibility (GOV) question in Brazil and Sweden shown in Figure 2. Clearly, by any sensible interpretation of "polarization," Brazil is more polarized than Sweden with respect to respondents' views about the proper size for government. Note that in the case of Brazil there are two distinct groups at each end point (the respondents who state "1" and "10," respectively), whereas responses are spread out more evenly for Sweden. Esteban and Ray (1994) developed a polarization measure that takes this into account. We therefore also calculate the level of polarization using Esteban and Ray's measure and a simple measure of bipolarization: the minimum of the proportion of respondents that answer "1" or "10." These measures are highly correlated with the standard deviation (see Appendix B for a more detailed discussion of the different polarization measures).

The economic policy questions are posed in different languages and contexts. Moreover, the fact that three of the questions relate to the current size of government is potentially problematic. For example, fewer people might prefer an increase in the size of government if the current size of government is large. Consequently, not only mean responses, but also polarization of preferences may depend on the size of government (e.g., larger size of government might generate agreement that government size should be reduced). The set of questions listed in Table 1 is therefore not ideal; it would have been better to use questions about the preferred absolute size of government rather than preferred changes from the status quo. However, as long as there is no censoring of responses and concentration of responses do not directly depend on the current size of government, the standard deviation is unaffected by whether questions refer to preferred changes from the status quo or preferences for the absolute size of government.[7] Table 2 also shows that the standard deviations calculated from the different economic policy questions are strongly correlated at the country level. The lowest correlation is 0.66 and the highest 0.86. The mean values are correlated to a much lower extent; the correlation ranges from −0.14 to 0.41. This suggests that it is much less of a problem that questions

TABLE 2. Pairwise Correlations of Standard Deviations

	EQUALITY	PRIVATE	GOV	COMP
EQUALITY	1			
PRIVATE	0.73	1		
GOV	0.70	0.86	1	
COMP	0.75	0.70	0.66	1

an index would be less straightforward to interpret, and it is unclear how to control for the mean value. Comparing the results for four related questions is also a sensible first robustness check.

[7] A simple numerical example illustrates the point. Consider two countries (denoted 1 and 2) with two types of voters (denoted A and B) of equal share of the population. In both countries, type A's ideal size of government is "2", whereas type B's ideal size is "8". If voters are asked about their ideal size of government, the mean value will thus be 5 and the standard deviation 3 in both countries. Now suppose that the actual size of government is "4" in country 1 and "5" in country 2 and that voters are asked how they want the size of government to change. In country 1, A prefers a change of −2, whereas B prefers a change of +4. In country 2, A prefers a change of −3, whereas B prefers a change of +3. In this case, the mean values will be +1 in country 1 and 0 in country 2, but the standard deviation will still be 3 in both countries. Note that this argument presumes that the scale of the responses is interpreted similarly irrespectively of whether questions ask about relative or absolute size.

TABLE 3. Countries with Lowest and Highest Levels of Political Polarization

Rank	Lowest	SD_GOV	Rank	Highest	SD_GOV
1	Pakistan	1.92	65	Morocco	3.26
2	Netherlands	2.11	66	Turkey	3.27
3	Denmark	2.15	67	Zimbabwe	3.32
4	Sweden	2.22	68	Tanzania	3.32
5	South Korea	2.27	69	Bangladesh	3.43
6	Norway	2.34	70	Brazil	3.44
7	Great Britain	2.39	71	Venezuela	3.46
8	Estonia	2.42	72	Dominican Republic	3.52
9	Finland	2.46	73	Mexico	3.55
10	Luxembourg	2.47	74	El Salvador	3.70

are country specific when focusing on the dispersion of responses rather than mean values.

What characterizes countries with high or low degrees of political polarization? Table 3 lists the 10 countries with the highest and lowest standard deviations for the question about government responsibility (GOV). Perhaps surprisingly, Pakistan is the country with the lowest level of political polarization. This is not a peculiarity of this particular question. As shown in Table A1 in Appendix A, Pakistan also has a very low standard deviation for the other economic policy questions. However, Pakistan is among the countries with the lowest response rates. In the case of the government responsibility question, 37% of the respondents in Pakistan said that they did not know or gave no answer at all.[8] The other countries on the list are less surprising, with the Scandinavian countries among the 10 most cohesive and 5 Latin American countries among the most polarized.[9] Another indication that our measure of polarization captures something essential is that political polarization is relatively stable over time. The correlation between our polarization measures and polarization calculated from the previous wave of the WVS varies between 0.72 and 0.81 for the four questions.[10]

Outcome and Control Variables

We focus on one broad measure of government size: general government consumption as a fraction of total consumption (GOVCONS). This measure has been compiled by Gwartney and Lawson (2008), based on data from the World Bank and the International Monetary Fund. To reduce measurement error, we consider the average of the years 2003 to 2005. This measure captures the extent to which governments rely on political rather than private choice to allocate resources, but it could also reflect whether governments have the fiscal and legal capacity to collect tax revenue. As we see in the empirical analysis, our results for democratic countries are robust when controlling for gross domestic product (GDP) per capita, indicating that our results are unlikely to be driven by differences in tax-collecting capacity. We also report the main results using a measure of redistribution, transfers, and subsidies as a fraction of GDP (GOVTRANSSUB), which is obtained from the same source as the consumption measure. Naturally, this measure says nothing about the beneficiaries of redistribution. A high share of transfers and subsidies in the economy does not necessarily imply that the government redistributes resources from one group to another (e.g., from the rich to the poor). Keeping this caveat in mind, we nevertheless interpret this as a noisy measure of the level of redistribution.

We use the same basic set of control variables as Persson and Tabellini (2003, sect. 3.2.1) in their government size regressions. We divide the Persson and Tabellini controls into two categories: one set of control variables that are likely to be exogenous with respect to both polarization and government size, and one set that may be endogenous. The exogenous controls are geographic dummy variables and colonial origin. The regional dummies are Africa (AFRICA), South and East Asia (ASIAE), and Latin and South America and the Caribbean (LAAM). The colonial variables indicate British (COL_UKA), Spanish (COL_ESPA), or other colonial origin (COL_OTHA) weighted by years of independence. The variables that may be endogenous are logarithm of GDP per capita in 2000 (LYP), openness to trade in 2000 (TRADE), proportion of population

[8] The report from the person responsible for collecting WVS data in Pakistan does not reveal anything particular except that certain regions of the country could not be included in the survey for political and security reasons (e.g., close to the Afghan border). The data from Pakistan may thus not be fully representative.

[9] It should be kept in mind, however, that we cannot readily compare polarization across continents because we only have data from 74 countries. In addition, there seems to be a tendency that larger and more developed countries are more likely to be included in the WVS.

[10] We use the most recent prior wave (1990 or 1995) that is available for each country to calculate the intertemporal correlations. There is also a 1980 wave of the WVS, but none of the four economic policy questions were used in that first wave. Another indication that political polarization is relatively stable over time is that the level of political polarization in East and West Germany in 1990, the year of the reunification, is remarkably similar. Ranking all countries by polarization in 1990, the rank of East and West Germany is 13 and 16 for EQUALITY, 12 and 4 for PRIVATE, 29 and 11 for GOV, and 14 and 9 for COMP.

between 15 and 64 (PROP1564) in 2000, proportion of population above 65 in 2000 (PROP65), a dummy variable indicating whether the country has a federal political structure (FEDERAL), and an indicator variable for Organisation for Economic Cooperation and Development (OECD) membership before 1993 with Turkey excluded (OECD). We include a number of additional control variables as robustness checks, but these are described further in connection with the results. The definitions and sources of all variables are listed in Table A2 in Appendix A.

ESTIMATION

In this section, we discuss our empirical strategy for investigating the relationship between polarization and size of government. Let y_i denote a measure of government size in country i. To test whether political polarization is related to size of government, we run the regression

$$y_i = \alpha + \beta\ Polarization_i + \boldsymbol{X_i\gamma} + \varepsilon_i, \qquad \textbf{(1)}$$

where $Polarization_i$ is a measure of polarization in country i and $\boldsymbol{X_i}$ is a vector of control variables measured at the country level. Because polarization may be correlated with the mean value of responses, we control for the mean in all regressions. Higher levels of political polarization are associated with smaller government in case $\beta < 0$. There are three main issues associated with the estimation of β. (There are also some other issues related to income inequality and survey data that we address toward the end of the Results section.)

First, $Polarization_i$ may be correlated with other variables that affect the size of government. We use three different specifications of the vector of control variables $\boldsymbol{X_i}$ to test for this possibility. In the "basic" specification, we only include the mean response as a control variable. In the "short" specification, we include the geographic and colonial controls from Persson and Tabellini (2003). In the "long" specification, we also include the potentially endogenous set of control variables (i.e., GDP per capita, openness to trade, federal political structure, OECD membership, and the two demographic variables). Note that by including endogenous variables in the regression, we control for mechanisms through which political polarization may affect size of government.[11] Comparing the estimate of β in the basic, short, and long specifications gives an indication of the robustness of the relationship between polarization and government size. We also perform further robustness tests by controlling for geographic, demographic, cultural, and political factors.

Second, political polarization may itself be affected by the size of government. Our main way of dealing with this problem is to divide the sample according to the level of democratic development. The idea is that government policy is more likely to be affected by polarization in democratic countries. Although political polarization may, in turn, be affected by government policies, it is not obvious why this should depend on the level of democratic development. A simple test of whether polarization causes smaller government is therefore to see whether the relationship between polarization and size of government is stronger in more democratic countries. We use the Polity IV democracy index (Marshall and Jaggers 2007) and classify the 30 countries with a democracy score (DEMOC) of 9 to 10 as "strong" democracies and the 39 countries with a score of 0 to 8 as "weak" democracies. We choose this particular cutoff in order to get roughly half of the countries in each group. The democracy index is not available for 5 countries, but we classify 3 of these countries as strong democracies, giving us a sample of 33 strong democracies in total.[12] As a robustness test, we divide the sample according to more inclusive criteria for "strong" democracies.

Third, the specification of regression (1) is problematic from both conceptual and statistical points of view for countries where respondents agree that the government should be kept at a minimum (or maximum). From a conceptual perspective, it is not possible for polarization to vary between countries where all citizens favor minimal government because polarization is then always zero. From a statistical point of view, it is difficult to disentangle the effect of polarization from the effect of changing the mean when responses are close to the end points of the scale.[13] Fortunately, there is no country in our data with a mean value of responses close to the end points of the scale or where the actual size of government is negligible.[14] For example, there are only two countries with a mean response below 4 and no country with a mean response above 8 for the GOV question.[15] We have done robustness checks where we remove the countries with the two highest or two lowest mean values from the data, but because the results remain essentially unchanged, we do not discuss

[11] For example, Gradstein and Justman (2002) argue that polarization has a negative effect on national income (which, in turn, may affect government size) because it increases transaction costs. Interestingly, the correlations between GDP per capita (LYP) and the polarization measures are strongly negative: −0.28 (SD_EQUALITY), −0.66 (SD_PRIVATE), −0.50 (SD_GOV), and −0.40 (SD_COMP).

[12] The countries for which data are missing are Bosnia and Herzegovina, Iceland, Luxembourg, Malta, and Peru. However, Iceland, Luxembourg, and Malta receive the highest possible score on the political and civil rights indices in 2000 published by Freedom House (2005) and, therefore, it seems uncontroversial to classify them as strong democracies. The democracy index is not available for Peru in 2000 because the country was "in transition" with a very low score on the democracy index prior to 2000 and a high score thereafter. Bosnia and Herzegovina was reported "in transition" for the years around 2000.

[13] As an extreme example, consider a country where all respondents answer "1" to a question on a 1-to-10 scale, implying a mean value of 1 and a standard deviation of 0. Now, because "1" is the lowest possible answer, any change in the structure of responses would change *both* the mean and the standard deviation, implying that the mean and the standard deviation would be highly correlated.

[14] Among the strong democracies, the share of GDP that goes to government consumption is lowest in Hungary (13.3%).

[15] The distribution of mean values looks similar for the other economic policy questions, except for COMP, where the average mean value is 3.64 (3.86 for strong democracies).

TABLE 4. Political Polarization and Government Consumption

	EQUALITY		PRIVATE		GOV		COMP	
No controls								
β (all)	–4.40	(2.70)	−4.95**	(2.28)	−8.32**	(2.48)	−12.22**	(1.89)
β (weak)	1.20	(2.72)	−0.01	(3.09)	−1.00	(3.69)	−4.64	(3.07)
β (strong)	−8.06**	(3.14)	−9.66**	(4.19)	−17.42***	(4.96)	−17.00***	(3.69)
Short specification								
β (all)	−3.63	(3.04)	−6.75***	(2.24)	−9.32***	(2.67)	−12.33***	(2.47)
β (weak)	−0.56	(3.88)	−2.90	(3.29)	−4.65	(4.26)	−7.89	(6.62)
β (strong)	−7.60**	(3.82)	−14.41***	(4.06)	−22.73***	(4.07)	−17.31***	(3.85)
Long specification								
β (all)	−0.54	(2.93)	−2.79	(2.40)	−6.26**	(2.85)	−4.34	(3.43)
β (weak)	−0.48	(4.14)	−2.52	(3.58)	−3.88	(5.55)	−0.95	(6.04)
β (strong)	−6.57	(4.02)	−18.73***	(4.79)	−19.56***	(4.51)	−12.90***	(4.13)

Note: This table reports coefficients and heteroscedasticity robust standard errors for the standard deviation of each question for the three specifications discussed in the text.
*$p = .10$; **$p = .05$, ***$p = .01$.

them further.[16] Another indication that extreme mean values are not a serious problem is that the correlations between mean and standard deviation are low for the economic policy questions. The exception is the question regarding private ownership of business (PRIVATE), where the correlation is 0.44.[17]

RESULTS

We first report the results from our three main specifications of control variables for different levels of democratic development. We then perform robustness tests with respect to additional control variables, income inequality, and issues related to our use of survey data. In the following section, we discuss theoretical mechanisms suggested by previous literature. In the main text of the article, we focus on general government consumption (GOVCONS) as the measure of government size, which is the government size variable available for most countries (74 countries), but we also report the main result for transfers and subsidies (GOVTRANSSUB). Some results that we refer to in the text are not reported in the article, but these are available in the Supplementary Appendix.

The results from regression (1) for the three different specifications (basic, short, and long) tested on the three samples (all countries, weak and strong democracies) are shown in Table 4. Political polarization has a negative and statistically significant relationship with government consumption in the specifications with controls for the mean response and exogenous set of control variables, but the size of the coefficients and significance levels are reduced in the specification with the endogenous set of control variables. However, the results depend entirely on the level of democratic development. When the sample is restricted to strong democracies, the estimated effect of polarization on government consumption is statistically significant and robust to the different sets of control variables, whereas it is close to zero and statistically insignificant for the weak democracies.[18] The strength of the association between polarization and public spending is substantial in strong democracies. For example, an increase in our polarization measure with respect to the GOV question by one standard deviation predicts a decrease in government consumption as a share of total consumption by 4.0 percentage points. The corresponding estimate varies between 2.0 and 6.1 percentage points for the other questions.

As expected, the results for strong democracies get somewhat weaker, but are generally still statistically significant—when we use more inclusive definitions of strong democracies. The same also holds if we use the classification of democracies from the Polity IV project, which is based on the Polity score (POLITY). According to this classification, 51 countries are defined as democracies. However, because there are so few countries in the nondemocracy category, it is difficult to make an inference about heterogeneous effects based on this classification.

An alternative explanation for the stronger relationship between polarization and size of government in strong democracies is that polarization is measured with more error in weak democracies, thus exacerbating attenuation bias. To adjust for measurement error, we instrument polarization in weak democracies with polarization from the most recent prior wave of the WVS. The estimates from these regressions are imprecise due to the limited number of observations, but the

[16] The results from this robustness check are available in the Supplementary Appendix.
[17] The correlations between mean value and standard deviation for the other polarization measures are: EQUALITY, −0.17; GOV, 0.13; and COMP, 0.27.
[18] The difference between "weak" and "strong" democracies is statistically significant, except for the EQUALITY question in the "long" specification, when we include an interaction effect between democratic development and polarization in regression (1).

size of the point estimates does not indicate that the results for weak democracies are due to problems of measurement.[19]

We interpret the stronger effect of polarization in democracies as suggestive evidence that there is a causal effect of polarization on the size of government. However, the possibility that polarization is affected by size of government cannot be ruled out. In particular, a larger size of government may induce respondents to agree that government should not expand, thereby generating a correlation between government size and polarization (see the discussion in the Data section). Because democratic countries on average have larger public sectors, this mechanism could potentially account for the stronger correlation between polarization and size of government in democracies. Although we cannot completely rule out this alternative explanation, there are two reasons why we find it less plausible. First, the results are similar for the question about attitudes toward competition (COMP), which is stated in absolute terms. Second, government size is not systematically related to a desire for smaller government (in terms of the mean responses). For example, people tend to favor a *higher* level of redistribution (as measured by the EQUALITY question) the larger is the size of government. This does not fit well with the idea that the low level of polarization in countries with large public sectors is caused by a general agreement that the size of government ought to be reduced.

Polarization is also associated with smaller governments when regression (1) is estimated using government transfers and subsidies as the dependent variable instead of government consumption. For strong democracies, political polarization is associated with lower levels of redistribution, whereas there is no relationship between polarization and redistribution in weak democracies. Political polarization is not statistically significant in the short specification for strong democracies, but statistically significant in three out of four cases in the long regression. The reason is that GDP per capita is not controlled for in the short specification. Conditional on the set of exogenous control variables (i.e., the variables in the short specification), richer countries have lower levels of redistribution. As poorer countries are also more polarized on average, not controlling for GDP per capita leads to an omitted variable bias toward zero in the short specification.

The relationship between polarization and size of government changes very little when we replace the standard deviation with the alternative polarization measures discussed in the Data section.[20]

As the effect of polarization on government consumption is only present in strong democracies, we focus on this subsample for the remainder of the article. To provide a more complete description of our results, Table 5 shows the estimated coefficients for all control variables when the sample is restricted to strong democracies.[21] We now turn to robustness checks with respect to additional control variables, income inequality, and survey data.

Robustness: Additional Control Variables

Table 6 reports the results when we add additional controls to the long specification. The first set of controls is geographic factors: percent of mountainous terrain (MOUNTAIN), the logarithm of country area[22] (AREA), and absolute distance to the equator (LATITUDE). The second set of controls includes additional demographic factors: the logarithm of total population (LOGPOP) and population density (POPDENS). We also include the average level of trust (TRUST), as well as measures of ethnic (ETHFRAC), religious (RELFRAC), and linguistic (LINGFRAC) fractionalization. Finally, we control for a number of political variables that have been found to explain the size of government in previous studies (e.g., Persson and Tabellini 2003): whether the country has a presidential regime (PRES) and whether the legislature is elected under a majoritarian rule (MAJ). Note that we restrict the sample to strong democracies and that the degrees of freedom are small in these regressions, implying that standard errors become large. Overall, the relationship between polarization and size of government remains robust when additional control variables are included in the regression. It is also worth noting that none of the additional control variables are consistently statistically significant.

Robustness: Income Inequality

One concern with the estimates reported previously is that polarization of political preferences could be a direct consequence of income inequality, which in turn might be affected by the size of government.[23] For example, spending on public schooling for the poor is

[19] Another indication that the results for weak democracies are unlikely to be driven by measurement error is that restricting the sample of weak democracies to countries with higher response rates, higher levels of literacy, or a high correlation between individual question responses does not give systematically different estimates.

[20] The results based on Esteban and Ray's (1994) measure of polarization are, however, weaker for certain parameter values. As discussed in Appendix B, Esteban and Ray's measure of polarization includes a parameter that measures the extent of sensitivity to polarization rather than dispersion. The results are weaker for high values of this parameter, which suggests that it is dispersion rather than polarization (i.e., concentration of responses to particular groups) that matters for size of government. We are reluctant to put much emphasis on this result due to the skewness of the country-level distribution of polarization for high values of the parameter (Figure B1). Note that the coefficient estimates (reported in the Supplementary Appendix) are not directly comparable across polarization measures. The reason is that each measure has a different scale (we have not undertaken any normalization with respect to the different measures).

[21] Note that the regressions reported in Table 5 are identical to the regressions for strong democracies in Table 4.

[22] Alesina and Wacziarg (1998) show that smaller countries have a larger share of public consumption of GDP.

[23] Recall that in political economy models such as Meltzer and Richard's (1981) model, voters' preferences for redistribution merely reflect their relative position in the distribution of income. Political preferences regarding redistribution will consequently be more dispersed the higher is pretax income inequality.

TABLE 5. Political Polarization and Government Consumption (Strong Democracies)

	EQUALITY		PRIVATE		GOV		COMP	
No controls								
β	−8.06**	(3.14)	−9.66**	(4.19)	−17.42***	(4.96)	−17.00***	(3.69)
Mean	1.44	(1.14)	0.86	(1.84)	−1.20	(1.06)	4.35**	(1.77)
Adj. R^2	0.222		0.229		0.460		0.379	
Short specification								
β	−7.60**	(3.82)	−14.41***	(4.06)	−22.73***	(4.07)	−17.31***	(3.85)
Mean	1.23	(1.12)	2.43*	(1.38)	−1.14	(0.96)	6.86***	(1.71)
AFRICA	−0.23	(2.26)	4.16	(2.73)	7.83***	(1.96)	2.16	(1.94)
ASIAE	—	—	—	—	—	—	—	—
LAAM	3.86	(5.89)	8.55***	(1.78)	−6.34*	(3.44)	0.27	(2.34)
COL_ESPA	−33.16*	(17.63)	−48.05***	(4.29)	14.11	(11.14)	−21.53***	(4.47)
COL_UKA	−1.44	(2.97)	1.94	(2.30)	2.96	(2.65)	1.83	(2.47)
COL_OTHA	5.66*	(3.06)	7.61***	(1.80)	5.52***	(1.52)	5.56**	(2.25)
Adj. R^2	0.427		0.649		0.639		0.479	
Long specification								
β	−6.57	(4.02)	−18.73***	(4.79)	−19.56***	(4.51)	−12.90***	(4.13)
Mean	−0.18	(1.80)	1.96	(1.76)	−1.21	(1.31)	4.95*	(2.58)
AFRICA	3.42	(7.04)	6.09	(4.85)	12.65***	(4.87)	0.86	(5.28)
ASIAE	—	—	—	—	—	—	—	—
LAAM	−0.50	(20.88)	10.16	(15.08)	23.98**	(11.66)	12.80	(16.41)
COL_ESPA	0.26	(65.50)	−48.48	(67.16)	−80.02**	(36.24)	−71.98	(48.58)
COL_UKA	−1.45	(4.87)	−0.68	(3.77)	7.20**	(3.00)	1.64	(4.78)
COL_OTHA	7.95	(6.16)	7.05*	(4.04)	7.90***	(2.62)	5.90	(4.37)
LYP	−2.36	(3.60)	−4.81	(2.97)	1.78	(2.09)	2.08	(2.80)
TRADE	0.02*	(0.01)	0.04	(0.02)	0.01	(0.01)	0.01	(0.02)
PROP1564	0.13	(1.02)	−0.33	(0.95)	−0.37	(0.70)	−0.82	(0.80)
PROP65	0.05	(0.55)	0.11	(0.48)	0.86	(0.47)	0.14	(0.55)
FEDERAL	−2.95	(3.30)	0.97	(2.82)	−1.53	(2.36)	−1.35	(2.58)
OECD	9.67	(7.32)	5.03	(6.79)	−1.41	(4.47)	−1.58	(5.33)
Adj. R^2	0.513		0.635		0.669		0.449	
N	25		24		33		33	

Note: This table reports coefficients and heteroscedasticity robust standard errors for the standard deviation of each question for the three specifications discussed in the text.
*$p = .10$; **$p = .05$, ***$p = .01$.

likely to reduce pretax income inequality. One way to control for this is to include a measure of income inequality in regression (1). As seen in Table 6, including the Gini coefficient (a measure of income inequality) in the long specification does not change the coefficients by much, with the competition (COMP) question as the exception. Note, however, that the Gini coefficient is strongly correlated with political polarization, implying that including the Gini index as a control exacerbates attenuation bias.[24]

Another way to control for income inequality is to create an "income-adjusted" measure of political polarization. For each country and question, we run a regression of the respondents' answers on the respondents' income.[25] We then calculate new polarization measures for each country based on the residuals from these regressions. This gives us polarization measures based on political opinions orthogonal to personal income. The income-adjusted polarization measures are highly correlated with the nonadjusted polarization measures; all correlation coefficients are above 0.99. Not surprisingly, rerunning the regressions of government performance using the income-adjusted standard deviations yields very similar results. The reason for the small differences between the income-adjusted and ordinary polarization measures is the low explanatory power of stated income for political preferences. A potential explanation for this result is that income is measured with error in the WVS.[26]

[24] Another problem is that the Gini index is based on consumption data for developing countries. To the extent that government consumption is correlated with redistribution from rich to poor, higher government consumption is therefore likely to reduce the Gini index for developing countries (because it is based on after-tax income). This would imply that Gini index is endogenous with respect to government consumption, thereby spuriously reducing the estimated effect of political polarization.

[25] Income in the WVS is measured on a 1-to-10 scale that is specific to each country. We include each income category as a dummy variable in the regressions.

[26] Current income may not be a very good proxy for permanent income. Therefore, we have also tested to add educational attainment (on a 1-to-3 scale) as a regressor in the first stage when computing the income-adjusted polarization measures. This "income-and-

TABLE 6. Political Polarization and Government Consumption: Additional Control Variables (Strong Democracies)

	EQUALITY		PRIVATE		GOV		COMP	
β	−8.55**	(4.08)	−20.43***	(4.87)	−21.39***	(5.92)	−8.05	(5.89)
MOUNTAIN	0.01	(0.08)	0.02	(0.05)	−0.04	(0.07)	−0.15	(0.10)
LATITUDE	1.99	(13.43)	−5.28	(9.95)	−6.31	(10.28)	14.64	(11.47)
AREA	1.81	(1.67)	1.76	(1.34)	0.44	(0.78)	−0.43	(1.22)
N	23		22		29		29	
β	−5.65	(4.18)	−19.42***	(4.93)	−19.80***	(4.45)	−14.65***	(5.13)
LOGPOP	0.87	(1.24)	0.80	(1.15)	0.07	(0.76)	−0.34	(1.53)
POPDENS	0.00	(0.01)	−0.00	(0.01)	0.00	(0.00)	−0.00	(0.01)
N	25		24		33		33	
β	−10.21***	(3.73)	−23.28***	(6.01)	−18.95**	(7.41)	−8.99	(5.58)
TRUST	12.94	(13.18)	11.00	(10.14)	−1.12	(8.82)	−9.84	(10.59)
N	25		24		33		33	
β	−4.24	(7.80)	−17.08**	(7.57)	−16.25**	(6.71)	−11.55	(7.64)
ETHFRAC	−8.71	(8.93)	−5.23	(5.05)	−7.14	(6.29)	−9.055	(8.32)
RELFRAC	0.70	(10.79)	−0.90	(6.28)	−0.99	(4.46)	−5.86	(7.78)
LINGFRAC	7.70	(10.20)	6.54	(7.85)	9.11	(9.04)	15.99**	(8.08)
N	25		24		33		33	
β	−5.47	(3.67)	−16.87**	(7.58)	−17.25***	(4.36)	−9.20*	(5.12)
PRES	−9.09**	(3.66)	−5.80	(4.30)	−2.16	(1.98)	−3.36	(4.10)
MAJ	−2.28	(1.58)	−0.07	(1.50)	−2.54	(1.79)	−3.69	(2.59)
N	25		24		33		33	
β	−4.51	(4.79)	−17.39*	(9.95)	−19.49**	(8.71)	−7.57	(6.51)
GINI	−0.89**	(0.45)	−0.52	(0.62)	−0.16	(0.29)	−0.57*	(0.30)
N	22		21		29		29	

Notes: All regressions include control variables from the long specification. This table reports coefficients and heteroscedasticity robust standard errors for the standard deviation of each question for the three specifications discussed in the text.
*$p = .10$; **$p = .05$, ***$p = .01$.

Robustness: Survey Data

A key problem in using survey data is that questions may not only capture differences in political preferences. In particular, the dimension of political conflict measured by our economic policy questions could be more salient in some countries than in others. If people do not perceive a question as capturing a relevant dimension of politics, then it seems plausible that they give it less thought, or that they are more uncertain about their preferences.[27] We perform two different tests to check whether political polarization is due to respondents' uncertainty about their actual preferences.

First, we include the country response rate as a control variable in regression (1). The idea is that in countries where many people are uncertain about their preferences, more people will also state that they "don't know" what they think or not answer the question at all. As shown in Table 7, the estimated effect of polarization is practically unchanged when the response rate (PROPRESP) to each question is included as a control variable in the long specification.

Second, we calculate the country-level correlations between individuals' responses to the economic policy questions. For each question, we then calculate the country average of the absolute value of the correlations with the other questions. This measure (COHERENCE) captures countries' "ideological coherence"—the extent to which responses to the questions follow a certain pattern—and we expect it to be lower the more uncertain people are about their political preferences.[28] Political polarization is negatively correlated with ideological coherence in both weak and

education–adjusted" measure of polarization is also highly correlated with our standard measure, with all correlation coefficients larger than 0.98.

[27] It is not clear whether uncertainty about preferences would lead to an upward or downward bias of the measured level of political polarization. For example, a uniform randomization on a 1-to-10 scale implies a standard deviation of 2.63, far from the theoretical maximum of 4.5 (when half of the respondents answers 1 and the other half 10). Alternatively, uncertain respondents may cluster around certain focal values (e.g., "5"), which would give a very low measured level of polarization. If uncertain respondents instead randomize between extreme values (i.e., "1" and "10"), then the measured level of polarization would be very high. It is uncertain a priori which case better represents the behavior of respondents.

[28] Our measure of "ideological coherence" is related to a literature in public opinion research on "ideological constraint." Linzer (2008, chap. 3) discusses this literature and proposes new measures.

TABLE 7. Political Polarization and Government Consumption: Survey Data Issues (Strong Democracies)

	EQUALITY		PRIVATE		GOV		COMP	
β	−6.47**	(2.86)	−15.38***	(4.63)	−18.83***	(4.60)	−12.07***	(4.05)
PROPRESP	−108.00***	(34.08)	−36.07**	(14.51)	−54.36	(58.66)	−60.45	(41.27)
N	25		24		33		33	
β	−4.43	(6.23)	−18.54***	(4.55)	−20.77***	(6.82)	−11.01	(7.30)
COHERENCE	25.98	(33.57)	18.96	(25.77)	−16.22	(19.73)	2.41	(20.94)
N	22		22		22		22	
β	−7.02*	(3.81)	−19.44***	(4.77)	−18.46***	(4.41)	−11.69***	(4.35)
CONFIDENCE	−6.04	(5.46)	−7.04*	(4.20)	−4.34	(3.25)	−4.94	(5.34)
N	25		24		33		33	
β	−8.54**	(3.65)	−21.92***	(3.98)	−18.85***	(5.41)	−11.43**	(5.06)
CORRUPTION	−1.18	(1.31)	−1.13	(0.82)	0.39	(0.86)	0.73	(0.96)
N	25		24		32		32	
β	−6.45	(4.30)	−19.23***	(5.22)	−19.48***	(4.53)	−12.90***	(4.13)
CONSENSUS	−1.64	(2.41)	3.42	(6.38)	−0.41	(1.94)	−4.95*	(2.58)
N	25		24		33		33	

Notes: All regressions include control variables from long specification. This table reports coefficients and heteroscedasticity robust standard errors for the standard deviation of each question for the three specifications discussed in the text.
*$p = .10$; **$p = .05$, ***$p = .01$.

strong democracies.[29] That is, the more polarized opinions are in a country, the lower is the correlation between responses to different questions. Moreover, ideological coherence is positively correlated with public spending.[30] However, as shown in Table 7, our results for polarization are robust to controlling for ideological coherence.[31] Ideological coherence has a positive sign in three out of four regressions, but the coefficients are never statistically significant.

The result that ideological coherence is higher in countries with a low level of polarization is reassuring in another sense. Because respondents may interpret questions in the political context of their own country, a potential concern is that political polarization is a consequence of partisan policies. For example, suppose that the government in a certain country redistributes income from group X to group Y. If people in this country think of "redistribution" as redistribution from X to Y, then measured preferences for redistribution may be polarized, even if the preferences are homogenous regarding some other redistribution scheme (say, from the rich to the poor). However, as shown previously, the estimated effect of polarization on government consumption is similar for all four questions, implying that partisan policies must shape opinions on these questions in order to invalidate our argument. The fact that the responses to the economic policy questions are more strongly correlated at the individual level in countries where polarization is low therefore indicates that divisive policies are not a main cause of the measured level of polarization.[32]

A related concern is that people might be uncertain about the trustworthiness of politicians. Such uncertainty could give rise to an unwillingness to funnel resources to the public sector and, in case people have different beliefs about how trustworthy politicians are, polarization in stated preferences for the size of the public sector. To test this possibility, we include the average response to the WVS question regarding the confidence in parliament (CONFIDENCE) as an additional control variable in regression (1). We also use the level of corruption (CORRUPTION) within the political system as a proxy for the trustworthiness of politicians. As shown in Table 7, the results change very little from either of these tests.

A final concern with the use of survey data is that people might not want to deviate too much from the opinions of others. A respondent who wants to minimize the maximum deviation from other respondents will answer 5 or 6 provided that he or she does not know the responses of others. If so, responses would be centered around 5.5 in countries where people are concerned about conforming to others. Hence, we include the absolute deviation from 5.5 (CONSENSUS) as a

[29] The correlation coefficients for the four questions vary between −0.19 and −0.38 in weak democracies and between −0.31 and −0.44 in strong democracies.

[30] The correlation coefficients are between 0.39 and 0.53 for strong democracies.

[31] Note that the size of the coefficients for ideological coherence and polarization cannot be directly compared because the scaling of the variables is different.

[32] Another form of endogeneity occurs if large governments invest more in policies that foster homogeneity. However, we have not found any evidence to support this view. For example, there is no indication in our data that political polarization is lower in countries with censorship and lack of a free press. The partial correlations between our measures of polarization and reporters without borders' index of press freedom (PFREEDOM) range from 0.16 and 0.40, where a higher score indicates less freedom.

control variable in regression (1) to serve as a rough control for "false consensus." There is an additional reason to include CONSENSUS as a control variable. Mean values need not perfectly reflect the true mean of preferences if responses are centered at either end of the scale (e.g., 1 or 10 on a 1-to-10 scale). For example, consider two countries with normally distributed underlying distributions of preferences with the same mean. If the mean is above 5.5, the country with the highest standard deviation of the underlying distribution will have a lower observable mean because a larger share of respondents has their answers censored at 10. Hence, the measured standard deviation might be informative about the true mean of preferences, even if we control for the measured mean. Including the absolute deviation from 5.5 as an additional control variable is a rough way of controlling for this confounding factor. As it turns out, our results remain almost exactly the same when CONSENSUS is included as a control variable in the main specifications. Another indication that censoring is quantitatively unimportant is that there is no systematic relationship between the mean values (in terms of left or right) and government size in the basic specification of regression (1) reported in Table 5.

WHY IS POLARIZATION RELATED TO THE SIZE OF GOVERNMENT?

So far, we have shown that polarization in the electorate is strongly correlated with size of government in democratic countries. We also presented some tentative evidence that the relationship is causal. In the remainder of the article, we try to answer the question as to *why* polarization among voters is related to the level of public spending. Most of the theoretical mechanisms mentioned at the beginning of this article imply that polarization in the electorate translates into polarization in the legislature or government. We therefore first investigate the overall question of whether polarization in the electorate is related to polarization in the legislature/government and then proceed to discuss specific theories. There are also theoretical reasons for why polarization in the electorate could have a direct effect on public spending. We discuss these theories toward the end of the section.

Polarization in the Legislature and Government

A previous empirical literature measured polarization or fractionalization in the legislature and government based on the size and number of political parties. For example, Bawn and Rosenbluth (2006) and Perotti and Kontopoulos (2002) showed that a larger number of parties in government is associated with higher levels of public spending. In a similar spirit, we use the data about parties in the legislature and in government, as well as a classification of the ideology of parties from the Database of Political Institutions (Beck et al., 2001). We focus on five different measures: an index of government fractionalization (HERFGOV), an index of fractionalization in the legislature (HERFLEG), the number of political parties in government (NGOV), the number of political parties in the legislature (NLEG), and an index of the political polarization of parties in the legislature (LEGPOL). The first two measures are Herfindahl indexes calculated as the sum of the squared seat shares of all parties in the government/legislature and is thus higher the more concentrated is the government or legislature to a few large parties.[33] The number of parties in the legislature (NLEG) and government (NGOV) are simply the raw sums of the number of parties. The index of political polarization of parties in the legislature (LEGPOL) is based on an assessment of the ideology of each political party. The polarization index measures the maximum political distance between the ideology of the executive's political party (Left, Center, or Right) and the ideologies of the three largest government parties and the largest opposition party.

Perhaps surprisingly, these five measures of polarization in legislature/government are not systematically related to our polarization measures based on the stated opinions of survey respondents. The Herfindahl index for the legislature (HERFLEG) is positively related to polarization in the electorate (i.e., the party structure is *more* concentrated in polarized countries), but the correlation is only significant for the government responsibility question (GOV). In contrast, the number of parties in the legislature is positively correlated with polarization based on three of the four questions, but the relationship is only significant for the question about private versus government ownership (PRIVATE). The measures based on the number of parties in the government (HERFGOV and NGOV) are positively related with polarization for some questions and negatively for others, but none of the correlations are statistically significant. The polarization index based on party ideologies (LEGPOL) is negatively related to polarization for all four questions, but none of the correlations are statistically significant.

These findings suggest that polarization in the electorate does not affect public spending through a direct effect on the level of polarization in the legislature or government. However, the number of political parties is a crude measure of polarization because it does not say anything about the political positions of different parties. LEGPOL is based on a classification of party ideology, but this classification is coarse (Left, Center, Right) and primarily based on the names of political parties. Moreover, the formation of political parties depends on many other factors than voters' political preferences. Examples include electoral rules (e.g., Duverger 1954; Riker 1982), sociological factors (e.g., Lipset and Rokkan 1967), and the ability of social and political groups to overcome collective action problems inherent in party formation (Olson 1965).

[33] The inverse of the Herfindahl index is often referred to as the effective number of legislative/government parties (e.g., Bawn and Rosenbluth 2006).

As an alternative way to measure polarization in the government and legislature, we use information about party sympathies in the WVS to derive measures of the political opinions among the supporters of different parties.[34] Polarization among supporters of political parties can be informative about polarization in the legislature/government both because the opinions of the party elite are related to the opinions of the party's supporters and because the party elite may act based on the preferences of their voters (irrespective of their own preferences).

We first calculate the standard deviation of responses for supporters of different political parties in the legislature in each country. Interestingly, the average level of political polarization among the supporters of parties in the legislature is closely correlated with our measures of polarization in the whole electorate.[35] For example, the level of polarization among Republican Party supporters in the United States in terms of our economic policy questions is higher than the level of polarization in the entire Swedish electorate. However, polarization of political parties (as measured by the Herfindahl index) is substantially lower in the U.S. Congress than in the Swedish seven-party parliament. This suggests that whether polarization in the electorate leads to a polarized party structure depends, among other things, on whether parties are formed based on differences in opinion regarding economic policy or according to views along other dimensions of political cleavage.[36]

We also calculate the level of polarization among respondents who support a party in government, as well as polarization among supporters of parties in opposition. This gives us two polarization measures for each country, one for the government and one for the opposition. If polarization in the electorate is related to government size through polarization in the government or legislature, polarization among supporters of the government should arguably have a stronger effect than polarization among supporters of the opposition. Table 8 shows that polarization among the supporters of the government is a more robust predictor of government consumption than polarization among the supporters of the opposition. The estimated effect of polarization among opposition supporters is close to zero or even positive when we include both polarization measures in the same regression.[37]

Taken together, these results indicate that polarization among voters does not affect the level of spending by influencing the number and relative sizes of political parties. We do find, however, that polarization among supporters of the government is more strongly associated with public spending than polarization among opposition supporters. With these results in mind, we now continue to discuss a number of specific theoretical mechanisms that can potentially explain how polarization affects spending.

Veto Players. According to Tsebelis' (2002) veto player theory, political decisions are more likely to be vetoed by political parties if there are many parties in government and if the ideological distance between parties is large. This suggests that polarization leads to fewer changes in government spending, but the theory is ambiguous with respect to the level of government spending.

As we showed previously, political polarization in the electorate is not related to measures of polarization in the government or legislature based on the number of political parties. However, as pointed out by, for example, Tsebelis (1999), the importance of veto players depends both on the number of veto players *and* on the ideological distance between them. This suggests that we should expect an interaction effect between political polarization and the number of veto players. To test for this, we include an interaction term between polarization and HERFGOV and HERLEG in regression (1). As we show in Table 8, the relationship between polarization and size of government is stronger for countries with fragmented governments and legislatures. The interaction effects are not statistically significant for all four questions, but this is partly due to few degrees of freedom in the long specification.[38] In addition, we interact polarization with the number of parties in the legislature and government (NLEG and NGOV). Political polarization is more strongly related to government size in countries with many parties in government and the legislature, but the difference is generally not statistically significant.[39]

Although the interaction effects are imprecisely estimated due to few observations, the results suggest that political polarization in the electorate is a stronger predictor of public spending in countries with fragmented legislatures and governments.

Strategic Incumbents. Following the seminal work by and Alesina and Tabellini (1990) and Persson and Svensson (1989), there is a large literature that focuses

[34] See Appendix A for a more detailed description of these data.

[35] This is true for all four economic policy questions, for unweighted averages across parties, and for averages weighted by the number of seats in the legislature for each party. All correlations between polarization in the electorate and the unweighted averages are above 0.84, and the correlations with the weighted averages are 0.92 or higher.

[36] In principle, the electorate could select perfectly between parties based on their political opinions along some dimension so that all supporters of the same party hold highly similar political view on that dimension or, alternatively, each party could harbor the same level of political polarization as society as a whole. The type of economic policy questions we consider, although important, only capture one relevant dimension of politics.

[37] We also calculate polarization among respondents that support parties in the legislature, but this measure is too highly correlated with polarization among government parties for us to be able to make any meaningful inference (the correlation is above 0.92 for all four questions).

[38] In the basic specification without other control variables than the mean, the interaction effects with HERFGOV and HERFLEG are significant in three out of four regressions.

[39] The results from these regressions are not reported in Table 8, but they are available in the Supplementary Appendix. The estimate for the interaction term with NLEG is sensitive to which controls are included. The estimated effect is positive for some questions in the basic and short specifications.

TABLE 8. Political Polarization and Government Size: Test of Theoretical Mechanisms (Strong Democracies)

	EQUALITY		PRIVATE		GOV		COMP	
β (Government)	−11.95**	(6.08)	−10.69**	(5.18)	−16.52***	(4.48)	−24.41***	(6.17)
β (Opposition)	9.62	(9.14)	−5.05	(4.50)	1.94	(7.62)	12.57**	(6.30)
N	25		24		33		33	
β	−20.90***	(7.94)	−37.78***	(8.70)	−34.19***	(11.62)	−25.88**	(13.12)
β *HERFGOV	28.67*	(16.41)	37.01**	(16.43)	27.27	(18.03)	20.26	(20.21)
HERFGOV	−76.24*	(43.47)	−82.07**	(38.31)	−71.27	(46.34)	−47.14	(48.20)
N	25		24		33		33	
β	−22.05	(15.64)	−52.71**	(23.93)	−33.44***	(11.35)	−24.50*	(14.41)
β *HERFLEG	61.47	(65.80)	128.66	(92.39)	59.89*	(34.86)	41.90	(45.72)
HERFLEG	−171.36	(175.62)	−284.22	(208.43)	−165.66*	(85.10)	−110.80	(104.81)
N	25		24		33		33	
β	14.10	(12.76)	8.37	(14.79)	8.19	(19.57)	13.85	(13.08)
β *GOVSEATS	−34.43*	(19.20)	−43.88*	(22.71)	−47.12	(32.20)	−50.97**	(25.59)
GOVSEATS	83.35	(50.93)	92.81*	(51.91)	112.19	(84.46)	104.76*	(59.55)
N	25		24		33		33	
β	−6.12	(4.32)	−18.75***	(5.79)	−18.42***	(4.55)	−10.40**	(4.29)
PROPRIGHTS	0.09	(0.16)	−0.00	(0.19)	0.12	(0.12)	0.16	(0.12)
N	25		24		33		33	
β (poor)	−5.62	(4.14)	−15.63***	(4.08)	−18.78***	(3.60)	−13.30***	(3.56)
N	25		23		32		32	
β (rich)	−6.50**	(3.14)	−23.53***	(6.17)	−23.07***	(4.68)	−12.00**	(5.00)
N	25		23		32		32	
β	9.96	(33.51)	−23.89	(46.94)	−17.93	(35.19)	39.09**	(17.00)
β *TURNOUT	−21.43	(42.71)	6.70	(63.87)	0.79	(42.03)	−66.82***	(23.38)
TURNOUT	66.25	(123.22)	−11.37	(144.05)	9.49	(109.81)	162.45***	(54.42)
N	23		22		30		30	

Notes: All regressions include control variables from the long specification. The table reports coefficients and heteroscedasticity robust standard errors for the standard deviation of each question for the three specifications discussed in the text.
*$p = .10$; **$p = .05$, ***$p = .01$.

on the dynamic strategic incentives of incumbent governments. One of the main ideas in this literature is that incumbents who are uncertain whether they will be reelected have an incentive to behave strategically by implementing policies that restrict the choice set of future governments. The more the preferences of the incumbent government depart from the preferences of potential future governments, the more the incumbent will try to restrict future governments' room to maneuver. For example, Persson and Svensson consider a model in which political parties differ in their preferred size of government and show that incumbents will act strategically by incurring debt in order to affect the cost of public spending in future periods. As pointed out by Persson and Svensson, another state variable that incumbents might use to influence future governments is a "public capital stock" that may be required for the production of public goods. This implies that polarization of preferences over the size of government may be systematically related to the actual size of government. The net effect of polarization on size of government may be either positive or negative, depending on whether it is easier to build up or destroy the stock of public capital. Azzimonti (n.d.), Glazer (1989), and Svensson (1998) develop models along similar lines, although size of government is increasing in polarization in Azzimonti (n.d.) and Glazer (1989), whereas it is decreasing in Svensson (1998).

The dynamic political economy models rely on electoral uncertainty: polarization only matters in countries where reelection probabilities are sufficiently low. To test for this, we include an interaction term between polarization and the government's share of the total number of seats in the legislature (GOVSEATS). The idea is that the reelection probability is increasing in the government's vote share. As shown in Table 8, the interaction term is negative, indicating that the effect of polarization on size of government is *larger* when the government's reelection probability is high.[40] Svensson (1998) models a more specific mechanism; incumbents restrict future governments' opportunity to raise funds by implementing an inefficient legal system. Although

[40] This finding is somewhat sensitive to which controls are included in the regression. In the basic specification (without other control variables than the mean), the interaction effect is insignificant for all questions, and the sign of the interaction effect is positive for two questions (but negative for the other two questions).

polarization is the ultimate cause of small government in his model, an inefficient legal system is the proximate cause. We test this aspect of Svensson's model by including a measure of property rights (PRIGHTS) into regression (1). As reported in Table 8, the estimated effect of polarization is not particularly sensitive to controlling for property rights, thus not supporting this particular model of strategic incumbent behavior either.

Two-stage Voting on the Budget. Alesina, Baqir, and Easterly (1999) develop a model of two-stage voting where the size of the budget is decided before its composition. Agents first vote on the amount to spend on a public good, and then they vote on the type of public good to provide. As voters in the first stage anticipate the outcome of the second stage, support for spending on the public good is decreasing in the dispersion of preferences over its type. This mechanism relies on a two-stage budget process and is therefore most plausible as a model of voting in legislatures that vote on the budget in two stages.

The main prediction of the model is that disagreement about how to spend public resources leads to preferences for lower levels of spending. Unfortunately, there are no questions in the WVS that directly capture preferences over the *type* of spending. Although our economic policy questions may partly reflect preferences for the focus of spending (e.g., spending on social relief programs instead of military equipment), they arguably capture preferences for the overall size of government better.[41] To distinguish between these two types of preferences, we therefore use a principal factor analysis. The underlying idea is that the responses to the four questions depend both on a factor common to all questions and one idiosyncratic term for each question. We interpret the common factor as reflecting a general preference for increasing or decreasing the size of government, whereas the idiosyncratic terms reflect preferences for a specific type of government intervention. This interpretation is supported by the factor loadings. The common factor has a positive impact on the private ownership (PRIVATE), government responsibility (GOV), and competition (COMP) questions, but a negative loading for the income inequality question (EQUALITY), which has a "reversed" scale. We calculate new polarization measures based on the common factor and the residuals for each question from the factor analysis. As it turns out, the new polarization measure based on the common factor is strongly positively correlated with each polarization measure based on the idiosyncratic factors. Both types of polarization measures are negatively related to government consumption, indicating that polarization over both size of government and composition of public goods matters for size of government.[42] The polarization measures based on the question residuals appear to be somewhat more robust as predictors of public spending when both types of measures are added jointly to regression (1), which gives some support for this particular mechanism. However, due to the high correlation between these measures and the limited number of degrees of freedom, we are reluctant to put much emphasis on this result.[43] In addition, we have not taken into account that not all countries use a two-stage voting process and that our measures of polarization are based on the preferences of voters, not on those of members of the legislature (which would be more suitable for testing this mechanism).

Coalition Formation. Fernández and Levy (2008) develop a model that explicitly shows how polarization in the electorate may affect the formation of political parties and redistribution. In their model, parties are endogenous and preference diversity among the poor affects their ability to extract resources from the rich. As taste diversity increases from a low level, redistribution becomes increasingly tilted toward special interest groups and general redistribution to the poor goes down. However, at a certain threshold, all special interest coalitions break down and general redistribution to the poor increases. Fernández and Levy's model thus predicts a U-shaped relationship between preference heterogeneity and general redistribution.

A distinguishing feature of this model is that the level of redistribution is determined by polarization among the poor. As a rough test of this model, we therefore calculate two measures of polarization for each country, one based on respondents who reported a below-median or median income and another for respondents with an income above the median. As is shown in Table 8, the results remain qualitatively similar irrespective of which measure is used, thus not supporting the mechanism suggested by Fernández and Levy (2008).

Voter Preferences and Turnout

We now turn to a discussion of some theoretical mechanisms that can explain how polarization among voters can affect spending without necessarily implying polarization in the legislature or government.

In Meltzer and Richard's (1981) canonical model of redistribution, the size of government is determined by the income of the median voter. Two minor modifications of the model, however, directly imply that dispersion of voter preferences may be related to the size of government. We discuss each case in turn.

Voter Turnout. The first modification of Meltzer and Richard's (1981) model is to relax the implicit assumption that all citizens vote in elections. Empirical research indicates that the income of the median voter tends to be above the median income in the population (Bassett, Burkett, and Putterman 1999). If

[41] Ideally, we would like to compute an aggregate measure of each voter's satisfaction with the focus on current spending using questions about many different areas of spending, such as schools, the armed forces, and poverty relief.

[42] Because data on all four questions are only available for 22 strong democracies, there are few degrees of freedom in the long specification, leading to large standard errors.

[43] Another complication in interpreting these results is that it is not clear from a theoretical perspective that the relevant variation in the polarization measures should be orthogonal.

people with a preference for a larger government are less likely to vote, then the median *voter* will prefer a smaller government than the median opinion in the *population*. Moreover, the difference between the median voter and the median in the population will often be larger the higher is the variance of the distribution of preferences. To see this, note that there are typically fewer voters in-between two points close to the median (e.g., two different tax rates) the more dispersed are political preferences. [44]

If voter turnout is the mechanism by which polarization affects size of government, then it would imply two other phenomena. First, we should expect the median *respondent* in polarized countries to desire an increase in spending (because the decisive voter prefers a lower level of spending than the median opinion in the population). Second, the effect of polarization should depend on the level of voter turnout.

Because the questions do not clearly distinguish preferences over the size of the budget from preferences about the type of spending, we use a principal factor analysis. We follow the same procedure as in the test of Alesina, Baqir, and Easterly's (1999) model, but exclude the competition question (COMP) from the analysis because that question does not refer to the status quo. Hence, the common factor reflects the preferred change from the status quo size of government. The correlation between the median and standard deviation of the common factor for strong democracies is positive (0.27), indicating that the median voter in polarized countries indeed desires an increase in public spending, although the correlation is modest and not statistically significant. Yet, if polarization affects government size through the nonrepresentativeness of the decisive voter, then we should also expect the estimated effect of polarization in the common factor to be sensitive to the inclusion of the median as a control variable. This is not the case, which casts doubt on the importance of the voter turnout mechanism. Furthermore, we find no evidence in favor of the voter turnout mechanism when we include an interaction term between polarization and voter turnout in parliamentary elections (TURNOUT) in regression (1) (Table 8).

Altruism. The second modification of Meltzer and Richard's (1981) model is that voters may not be completely selfish. Previous research has shown that attitudinal similarity is a strong predictor of altruism, attraction, and friendship (e.g., Batson et al. 1981; Byrne 1961, 1971; Chen and Kenrick 2002; Feren, Carroll, and Olian 1988; McGrath 1984; Newcomb 1961; Suedfeld, Bochner, and Wnek 1972), suggesting that political polarization may be related to voter altruism.[45] Depending on the exact shape of the income distribution, a general decrease in altruism could in theory lead to either more or less redistribution. In practice, however, the median voter typically does not gain from redistribution. This implies that lower levels of altruism reduce redistribution and provision of public goods (Bassett, Burkett, and Putterman 1999).

In contrast to the other theoretical mechanisms, an effect of polarization on size of government via altruism could arise due to polarization about *any* type of attitude question that respondents consider salient. As a test of this mechanism, we therefore compare the results for polarization in economic policy with the results for polarization using other types of questions. We use five questions that have been deemed particularly important to explain cultural differences in value orientation across time and cultures (Inglehart and Baker 2000).[46] The five questions are questions about the importance of god (GOD), strength of national pride (PRIDE), respect for authorities (AUTHORITY), and two questions about whether abortion (ABORT) and homosexuality (HOMO) are justifiable. Naturally, the validity of this test hinges on the assumption that attitudinal similarity in terms of economic-political values is not more important for altruism than attitudinal similarity in other domains.

The estimated effects of polarization (in economic policy) remain largely unchanged when the standard deviations and means of the five questions about value orientation are included in the long specification. Polarization in terms of respect for authorities and attitudes toward homosexuality is associated with larger government, whereas polarization in the other three questions is negatively related to size of government, but the coefficients are most often not statistically significant. It is noteworthy that polarization in all five questions is negatively correlated with polarization in three of the four economic policy questions. For example, recall that Sweden was one of the most cohesive countries with respect to the government responsibility question, whereas Brazil was one of the most polarized. The opposite holds for the question about respect for authorities: Sweden is among the 10 most polarized and Brazil among the 20 most cohesive.

Taken together, these results do not lend much support to the idea that polarization affects public spending through voter altruism. The results also suggest that polarization is not one dimensional, but highly domain specific.

Theoretical Mechanisms: Summary of Results

The main result from our tests of theoretical mechanisms is that polarization is more strongly related to

[44] This holds if, for example, voter preferences follow a normal or a uniform distribution. More generally, it holds whenever an increase in dispersion shifts probability mass from the center to the tails. See Landsberger and Meilijson (1990) for one characterization of such changes in the context of risk measurement.

[45] The relationship between attitudinal similarity and altruism can be rationalized in terms of evolutionary psychology; see Hamilton (1964); Olson, Vernon, and Jang (2001); Park and Schaller (2005); and Tesser (1993).

[46] Inglehart and Baker (2000) list 10 different questions, but we exclude 5 of these because they concern behavior, are based on an index of other questions, or only allow dichotomous responses. We also exclude questions about personal happiness because they do not refer to a preference or a belief.

the size of government in countries with fragmented party structures. This is in line with veto player theory; spending proposals are more likely to be vetoed when there are several parties that disagree about the proper course of action. We also found some support for the idea that disagreement about the direction of spending matters more than disagreement about the level of spending (as predicted by Alesina, Baqir, and Easterly 1999). Although we found no support for theories that rely on strategic behavior of incumbent governments, coalition formation, voter turnout, or voter altruism, our tests of these theories are quite weak, mainly due to few observations and data limitations. More theoretical and empirical research on the link between polarization and size of government is needed before definitive conclusions can be drawn.

CONCLUSION

The relationship between political polarization and size of government has been the subject of much theoretical work in economics and political science. In this article, we conduct the first empirical test of this relationship that uses a measure of political polarization based on self-reported political preferences. From a theoretical perspective, polarization could lead to either larger or smaller governments. We show that our measures of political polarization are strongly negatively correlated with the level of public spending. This relationship is robust to a large set of control variables and holds for several different polarization measures. We also find the correlation between polarization and government size to be significantly stronger among democratic countries, which supports (although it does not prove) a causal interpretation. One particular concern with this interpretation, however, is that three out of our four measures of polarization are based on respondents' preferred changes from the current size of government, which implies that measured polarization may depend on government size. This is an alternative explanation for our findings that we could not completely rule out.

We made some progress in uncovering *why* polarization is related to government spending, although further research is needed to draw a firm conclusion. One noteworthy finding is that polarization in the electorate is unrelated to the fragmentation of the government and legislature in terms of the number of political parties. We did, however, find that the effect of political polarization was stronger in countries with fragmented governments, suggesting that polarization in terms of opinions and party structure interact in a way consistent with veto player theory.

The main priority for future research is to better identify the underlying causal mechanism. For this purpose, it would be interesting to examine whether political polarization can explain variation in public spending within countries. A definite test of the causal mechanism does, however, require some kind of exogenous variation in political polarization that does not have an independent effect on the size of government. Unfortunately, it is difficult—if at all possible—to come up with an instrument that affects political polarization, but does not have an independent effect on government size.

Another area for future research is to analyze the determinants of political polarization, a topic that is beyond the scope of this article. Previous research presents several interesting ways to study this question. For example, media probably plays a role in shaping political preferences. Bernhardt, Krasa, and Polborn (2008) developed a model that predicts that profit-maximizing media firms may have an incentive to supply biased news to partisan audiences, and DellaVigna and Kaplan (2007) and Gerber, Karlan, and Bergan (2006) empirically showed that biased media actually affects voting behavior. Political polarization could also be due to a divergence in beliefs about the effects of different policies rather than by a conflict of interest or partisanship. Dixit and Weibull (2007) and Acemoglu, Chernozhukov, and Yildiz (2007) theoretically studied how such polarized beliefs could arise.

APPENDIX A: DATA

Data on Party-level/Government/Opposition Polarization

To calculate polarization for political parties and for supporters of the government and opposition, we use the question in the World Values Survey (WVS) that asks respondents about which party the respondent would vote for if national elections were held tomorrow (WVS code: e179). The political parties in the WVS were then matched with data on the number of seats in the legislature and whether the party was in government or opposition. All respondents that supported parties that were not represented in the legislature were excluded from the data. The resulting data was then used to calculate the standard deviation of responses for each political party in each country and for government/opposition supporters in each country.

The data about political parties (number of seats and government/opposition) is based on election results from the most recent election prior to the start of the survey in each country. The main data source Beck et al. (2001), but we have also relied on other data sources (details are available on request).

TABLE A1. List of Countries, Survey Year, and Political Polarization

Country	Code	Year	SD_EQUALITY	SD_PRIVATE	SD_GOV	SD_COMP
Albania	ALB	2002	2.473	2.428	2.770	2.029
Algeria	DZA	2002	2.572	3.194	3.014	
Argentina	ARG	1999	3.253	3.075	3.151	3.189
Armenia	ARM	1997	2.779	2.845	2.491	2.538
Australia*	AUS	1995	2.555	2.294	2.618	2.116
Austria*	AUT	1999	2.569	2.101	2.567	2.012
Azerbaijan	AZE	1997	2.921	3.010	2.798	2.551
Bangladesh	BGD	2002	2.855	3.351	3.432	2.474
Belgium*	BEL	1999	2.924		2.729	2.604
Bosnia and Herzegovina	BIH	2001	2.604	2.657	2.865	2.147
Brazil	BRA	1997	3.441	3.197	3.444	2.923
Bulgaria	BGR	1999	3.005		2.858	2.465
Canada*	CAN	2000	2.663	2.214	2.562	2.356
Chile*	CHL	2000	2.962	2.805	2.673	2.824
China	CHN	2001	3.111	2.867	3.220	2.186
Colombia	COL	1997–98	2.968	3.154	3.139	
Croatia	HRV	1999	2.961	2.983	3.117	2.430
Czech Republic*	CZE	1999	2.781	2.536	2.565	2.200
Denmark*	DNK	1999			2.148	2.238
Dominican Republic	DOM	1996	2.868	3.174	3.524	2.993
Egypt	EGY	2000	2.051	2.871	2.778	
El Salvador	SLV	1999	3.400	3.443	3.702	3.203
Estonia	EST	1999	2.404	2.445	2.421	2.343
Finland*	FIN	2000	2.583	2.086	2.456	2.230
France*	FRA	1999	2.978	2.219	2.511	2.699
Georgia	GEO	1996	2.645	3.056	2.747	2.416
Germany*	DEU	1999		2.284	2.704	2.181
Great Britain*	GBR	1999	2.547	2.186	2.393	2.152
Greece*	GRC	1999			2.581	2.535
Hungary*	HUN	1999			2.839	2.545
Iceland*	ISL	1999	2.845	2.119	2.641	1.855
Indonesia	IDN	2001	2.328	2.635	3.102	
Iran	IRN	2000	2.398	2.618	2.695	
Ireland*	IRL	1999	2.749	2.276	2.540	2.290
Italy*	ITA	1999	2.729	2.214	2.675	2.487
Japan*	JPN	2000	2.201	1.851	2.589	2.068
Jordan	JOR	2001	2.735	2.951	2.819	
Kyrgyzstan	KGZ	2003	3.051	3.186	3.225	2.842
Latvia	LVA	1999			2.665	2.287
Lithuania*	LTU	1999	3.075	2.891	2.830	2.698
Luxembourg*	LUX	1999	2.606		2.468	2.484
Macedonia	MKD	2001	3.023	2.877	2.879	2.536
Malta*	MLT	1999			2.759	2.086
Mexico	MEX	2000	3.606	3.306	3.548	3.233
Moldova	MDA	2002	2.635	2.764	2.692	2.562
Morocco	MAR	2001	3.099	3.508	3.264	2.212
Netherlands*	NLD	1999	2.025	1.860	2.111	2.044
New Zealand*	NZL	1998	2.628	2.269	2.701	2.261
Nigeria	NGA	2000	2.877		2.866	
Norway*	NOR	1996	2.264	1.906	2.344	1.902
Pakistan	PAK	2001	2.151	1.647	1.917	
Peru	PER	2001	2.806	2.861	3.224	2.768
Philippines	PHL	2001	2.716	2.679	2.915	2.490
Poland*	POL	1999	3.183	2.834	2.617	2.761
Portugal*	PRT	1999		2.356	2.727	2.658
Romania	ROM	1999	3.042	3.233	3.234	2.318
Russia	RUS	1999	3.006	2.763	2.905	2.692
Singapore	SGP	2002	2.305	2.444	2.675	2.067
Slovakia*	SVK	1999			2.611	2.232
Slovenia*	SVN	1999	2.689		2.655	2.279
South Africa*	ZAF	2001	3.120	3.060	3.114	2.532
South Korea	KOR	2001	2.747	2.386	2.271	2.239

TABLE A1. Continued

Country	Code	Year	SD_EQUALITY	SD_PRIVATE	SD_GOV	SD_COMP
Spain*	ESP	1999–2000	2.858	2.494	2.505	2.350
Sweden*	SWE	1999			2.221	1.924
Switzerland*	CHE	1996	3.073	2.381	2.719	2.356
Tanzania	TZA	2001	3.834	3.836	3.319	3.137
Turkey	TUR	2001	3.248	3.298	3.267	3.093
USA*	USA	1999	2.567	2.239	2.697	2.396
Uganda	UGA	2001	3.182	3.016	3.104	2.310
Ukraine	UKR	1999	2.981	2.975	2.998	2.971
Uruguay*	URY	1996	3.250	2.718	2.861	2.869
Venezuela	VEN	2000	3.442	3.309	3.460	3.015
Vietnam	VNM	2001	3.055	2.858	2.935	2.638
Zimbabwe	ZWE	2001	3.436	3.431	3.318	2.623

Note: Asterisks (*) indicate strong democracies.

TABLE A2. Dependent and Control Variables

		N
Dependent variables		
GOVTRANSSUB	General government transfers and subsidies as a percentage of GDP. Average for 2003, 2004, and 2005. *Source*: Gwartney and Lawson (2008).	69
GOVCONS	General government consumption as a percentage of total consumption. Average for 2003, 2004, and 2005. *Source*: Gwartney and Lawson (2008).	74
Basic control variables		
AFRICA	Dummy equal to 1 if the country is in Africa. *Sources*: Persson and Tabellini (2003) and own classification.	74
ASIAE	Dummy equal to 1 if the country is in Southern or Eastern Asia. *Sources*: Persson and Tabellini (2003) and own classification.	74
LAAM	Dummy equal to 1 if the country is in Latin America, Central America, or the Caribbean. *Sources*: Persson and Tabellini (2003) and own classification.	74
COL_ESPA	Spanish colonial origin weighted by the number of years between independence and 1998. The variable takes on the value $(250 - t)/250$ for countries with Spanish colonial origin (where t is the years of independence) and zero for other countries. *Source*: Persson and Tabellini (2003).	74
COL_UKA	British colonial origin weighted by the number of years of independence (see COL_ESPA). *Source*: Persson and Tabellini (2003).	74
COL_OTHA	Other colonial origin weighted by the number of years of independence (see COL_ESPA). *Source*: Persson and Tabellini (2003).	74
LYP	Natural logarithm of real GDP per capita in constant 2000 dollars in year 2000 (2001 for Singapore). *Source*: World Bank (2009).	74
TRADE	Sum of exports and imports as a share of GDP in 2000 (2001 for Singapore). *Source*: World Bank (2009).	74
PROP1564	Proportion of population aged 15 to 64 in 2000. *Source*: World Bank (2009).	74
PROP65	Proportion of population aged 65 or older in 2000. *Source*: World Bank (2009).	74
FEDERAL	Dummy equal to 1 if the country has a federal political structure. *Sources*: Adserà, Boix, and Payne (2003) and Persson and Tabellini (2003).	74
OECD	Dummy equal to 1 if the country was an OECD member before 1993 (excluding Turkey). *Sources*: Persson and Tabellini (2003) and OECD.	74
Additional variables (ordered according to appearance in the text)		
DEMOC	Index of the level of institutionalized democracy in 2000. Scale from 0 to 10, where 10 indicates the highest level of democracy. *Source*: Marshall and Jaggers (2007).	69
POLITY	Index of institutionalized democracy/autocracy in 2000. Scale from –10 to 10, where 10 is the highest level of democracy (and the lowest level of autocracy). *Source*: Marshall and Jaggers (2007).	69
MOUNTAIN	Percent mountainous terrain. *Sources*: Fearon and Laitin (2003), who built on the work by geographer A.J. Gerard for the World Bank.	69
LATITUDE	The absolute value of the latitude of the country, scaled to take values between 0 and 1. *Sources*: Teorell, Holmberg, and Rothstein (2008), who in turn obtained the data from La Porta et al. (1999).	74

TABLE A2. Continued

AREA	Logarithm of total surface area measured in square kilometers. *Source*: World Bank (2009).	74
LOGPOP	Logarithm of total population in 2000. *Source*: World Bank (2009).	74
POPDENS	Population density (people per square kilometer) in 2000. *Source*: World Bank (2009).	74
ETHFRAC	Ethnic fractionalization. Reflects the probability that two randomly selected individuals belong to the same ethnic group. This is calculated as one minus the sum of squared shares of each group and therefore takes values between 0 and 1. *Source*: Alesina et al. (2003).	74
RELFRAC	Religious fractionalization measured in the same way as ETHFRAC. *Source*: Alesina et al. (2003).	74
LINGFRAC	Linguistic fractionalization measured in the same way as ETHFRAC. *Source*: Alesina et al. (2003).	73
TRUST	Average (binary) response from WVS (code a165) collected in the year listed in Table A1. *Source*: European Values Study Group and World Values Association (2006).	74
PRES	Dummy variable equal to 1 if the country had a presidential regime in 2000. The original variable takes the values of 0, 1, and 2. We classify countries with values 1 and 2 as "parliamentary" and those with zero as "presidential." *Source*: Beck et al. (2001).	73
MAJ	Dummy equal to 1 if elections are based on plurality rule in 2000, 0 otherwise. *Source*: Beck et al. (2001).	71
GINI	Estimates of the Gini index based on primary household survey data obtained from government statistical agencies and World Bank country departments. Data for high-income economies is from the Luxembourg Income Study database. Data refer to various years between 1995 and 2005 and the observation closest to the year 2000 has been used. *Source*: World Bank (2009).	70
PROPRESP	Proportion of respondents in WVS that did not respond to the survey question or said that they did not have an answer. There is one variable for each of the four questions, EQUALITY, PRIVATE, GOV and COMP. *Source*: European Values Study Group and World Values Association (2006).	62–74
COHERENCE	For each of the four questions, EQUALITY, PRIVATE, GOV, and COMP, this variable is the average of the absolute correlation of individual responses with the three other questions calculated for each country. *Source*: European Values Study Group and World Values Association (2006).	53
PFREEDOM	Press freedom index in 2002 ranging from 0 (*total press freedom*) and 100 (*no press freedom*). *Sources*: Teorell, Holmberg, and Rothstein (2008), which obtained the data from Reporters Sans Frontières.	60
CONFIDENCE	The average response to the question about the confidence in the parliament from WVS (code e075) collected in the year listed in Table A1. Responses range from 1 (*a great deal*) to 4 (*none at all*). *Source*: European Values Study Group and World Values Association (2006).	73
CORRUPTION	Transparency International's index of corruption in the public sector ranging from 0 (*highly corrupt*) to 10 (*highly clean*). *Source*: Teorell, Holmberg, and Rothstein (2008).	67
CONSENSUS	This is the distance between the average response and 5.5 for each of the four questions, EQUALITY, PRIVATE, GOV and COMP.	62–74
HERFGOV	Herfindahl index: government. The sum of the squared seat shares of all parties in the government. Data for 2000. *Source*: Beck et al. (2001).	72
HERFLEG	Herfindahl index: legislature. The sum of the squared seat shares of all parties in the legislature. Data for 2000. *Source*: Beck et al. (2001).	72
NGOV	Total number of parties in the government. Data for 2000. *Source*: Beck et al. (2001).	74
NLEG	Total number of government and opposition parties. Data for 2000. *Source*: Beck et al. (2001).	74
LEGPOL	Polarization in legislature and government. The maximum distance between the chief executive's party ideology and the three largest government parties and the largest opposition party. Scale: 0–2. Data for 2000. *Sources*: Keefer and Stasavage (2003), but data have been obtained from the data set compiled by Beck et al. (2001).	64
GOVSEATS	Fraction of seats in the parliament that was held by the government in 2000. *Source*: Beck et al. (2001).	71
PRIGHTS	Heritage Foundation's property rights score ranging from 0 and 100, where 100 is the maximum degree of protection of property rights. *Source*: Teorell, Holmberg, and Rothstein (2008).	74
TURNOUT	Turnout in the most recent parliamentary election prior to 2002 measured as the total number of votes cast divided by the number of registered voters (RVs). *Sources*: Teorell, Holmberg, and Rothstein (2008), who obtained the data from the International Institute for Democracy and Electoral Assistance.	65
GOD	Question about how important god is in the respondent's life from WVS (code f063) collected in the year listed in Table A1. Responses range from 1 (*not at all important*) to 10 (*very important*). *Source*: European Values Study Group and World Values Association (2006).	73

TABLE A2. Continued

PRIDE	Question about how proud the respondent is of his or her nationality from WVS (code g006) collected in the year listed in Table A1. Responses range from 1 (*very proud*) to 4 (*not at all proud*). *Source*: European Values Study Group and World Values Association (2006).	74
AUTHORITY	Question about whether respondent would like to see a change toward "greater respect for authority" from WVS (code e018) collected in the year listed in Table A1. Responses range from 1 (*good thing*) to 3 (*bad thing*). *Source*: European Values Study Group and World Values Association (2006).	74
ABORT	Question about whether abortion is justifiable from WVS (code f120) collected in the year listed in Table A1. Responses range from 1 (never justifiable) to 3 (*always justifiable*). *Source*: European Values Study Group and World Values Association (2006).	74
HOMO	Question about whether homosexuality is justifiable from WVS (code f118) collected in the year listed in Table A1. Responses range from 1 (*never justifiable*) to 3 (*always justifiable*). *Source*: European Values Study Group and World Values Association (2006).	73

Note: GDP, gross domestic product; OECD, Organisation for Economic Development; WVS, World Values Survey.

APPENDIX B: ALTERNATIVE POLARIZATION MEASURES

As discussed in the Data section, there are several ways to measure polarization. In this appendix, we discuss alternative polarization measures, in particular, the polarization measure suggested by Esteban and Ray (1994).

Two of the theoretical papers about the relationship between polarization and size of government discussed in this article suggest specific measures of polarization. Alesina, Baqir, and Easterly (1999) construct a model where the provision of public goods is decreasing in the median deviation from the median preference for the composition of public goods. This is a crude measure given that there are only a few discrete responses to the questions in the WVS. A close substitute to the median distance to the median is the average absolute deviation from the average. This measure is practically indistinguishable from the standard deviation in our data; the correlation is 0.992 for the government responsibility question. The model by Fernández and Levy (2008) calls for a polarization measure based on the probability that two randomly matched individuals in the population hold the same opinion. However, this measure does not resonate well with multiple-choice questions because it treats "4" and "5" on a 1-to-10 scale as two groups, as distinct as "1" and "10".

Esteban and Ray's (1994) measure of polarization includes a parameter α that, loosely speaking, measures the extent of sensitivity to polarization rather than dispersion. To satisfy their axioms, α must be between zero and approximately 1.6. We calculate Esteban and Ray's measure for α equal to 0.5, 1.0, and 1.5. As pointed out in Section 4 of Esteban and Ray's article, their measure is not designed for cases in which individuals in one category also identify with people in the neighboring category. For example, if 25% of respondents answer "1", 25% answer "2", and the rest answer "10", then this is considered less polarized than an equal split between "2" and "10". However, if people who answer "1" or "2" have similar opinions, then it can be argued that the first example is more polarized because preferences in this group are closer to the end point of the scale. For this reason, we also consider a simple measure of bipolarization: the minimum of the proportion of respondents that answer "1" or "10". Note that both the standard deviation and Esteban and Ray's polarization measure treat the ordinal scale of responses to multiple-choice questions as an interval scale. Mouw and Sobel (2001) demonstrate that it is possible to measure dispersion without this assumption, but their measure is difficult to interpret in our context. Our bipolarization measure, however, is only based on the ordinal properties of responses.

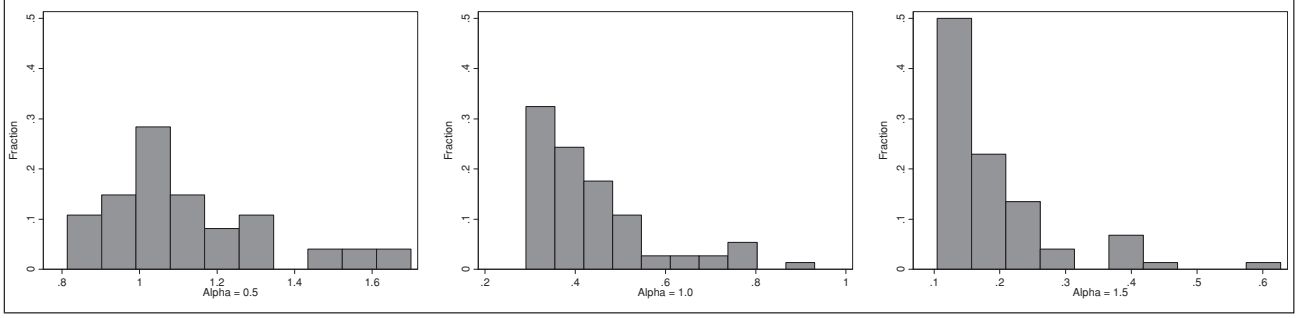
TABLE B1. Correlations with Polarization Measures (GOV)

Bipolarization	0.90
Esteban and Ray (1994) ($\alpha = 0.5$)	0.95
Esteban and Ray (1994) ($\alpha = 1.0$)	0.80
Esteban and Ray (1994) ($\alpha = 1.5$)	0.65

In the case of Sweden and Brazil (see the Data section), Brazil is more polarized irrespective of which measure is used. The standard deviation is 3.44 in Brazil and 2.22 in Sweden, whereas the measure of bipolarization is 0.23 in Brazil and 0.02 in Sweden. Brazil ranks higher than Sweden based on Esteban and Ray's (1994) measure of polarization for all three levels of α, but the relative difference between the two countries falls substantially the higher is α.

Table B1 shows the correlation between the standard deviation and the other polarization measures for all countries in our data based on the question about government responsibility. Esteban and Ray's (1994) measure of polarization is strongly correlated with the standard deviation, but the higher is α, the lower the correlation. This suggests that we could test whether it is polarization or dispersion that matters for public spending simply by comparing our results for the standard deviation with those for Esteban and Ray's measure with high α. However, as noted previously, Esteban and Ray's polarization measure is not ideal for measuring polarization of responses to survey questions. In addition, the distribution of polarization scores becomes more skewed the higher is α. To see this, Figure B1 displays histograms of Esteban and Ray's measure for the three different values of α. For example, when α is equal to 1.5, half of the countries are lumped together in a very narrow range. This makes reliable inference difficult. Moreover, our measure of bipolarization is strongly correlated with the standard deviation. This implies that it is difficult to distinguish empirically between "dispersion" and "polarization."

FIGURE B1. Histogram of Esteban and Ray's (1994) Polarization Measure for the Government Responsibility Question (GOV) for $\alpha = 0.5$ (*left*), $\alpha = 1.0$ (*center*), and $\alpha = 1.5$ (*right*)



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