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Ideological polarization and government debt

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Abstract
Models of strategic debt predict that public debt increases with polarization, measured by the ideological distance between the government and its likely successor. Conversely if voters are both short-termist and also more likely to switch their vote for parties offering higher spending and public good provision when the electorate is ideologically concentrated, then debt can fall with polarization, measured by dispersion of ideological preferences in the electorate. Using time-varying polarization measures generated from ideology data from party manifestos, we find a sizable and statistically significant negative association between debt levels in OECD countries and ideological polarization in the electorate.

Keywords Public debt · Strategic debt · Ideological polarization

JEL Classification H63

1 Introduction

In 2010 average central government debt in the OECD stood at 69% of GDP. In 1974 this figure stood at 23%, down from 88% in 1945. Moreover, at any point in time there is substantial cross-country variation. 2010 debt levels varied from 22% in Switzerland to 189% in Japan. Whilst it is widely recognized that these outcomes are the product of imperfect political processes, a full explanation represents a formidable challenge to political economics.[1]

[1] As noted by Alesina and Perotti (1995) efficiency-based explanations (e.g. Barro, 1979) alone cannot explain either the levels or variation in public debt observed across countries and time. Recent contributions include Battaglini and Coate (2008) and Yared (2010). Eslava (2011) provides an excellent recent survey.

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Persson and Svensson (1989) and Alesina and Tabellini (1990) formalized the idea of 'strategic debt'. Given the likelihood of being replaced in the future, an ideologically motivated incumbent will encumber future (ideologically distant) governments with debt. The greater the ideological distance between the parties, the greater the level of debt.[2]

On the other hand, as we discuss in the next section polarized preferences serve to weaken electoral mechanisms which themselves plausibly underpin proclivity to debt. The novel hypothesis is that polarization as defined by greater ideological dispersion in the electorate will instead reduce government debt.

This paper investigates the relationship between central government debt and ideological polarization empirically. Figure 1 presents a simple cross-country correlation between central government debt levels in 2010 and the polarization measure generated from the World Values Survey used by Lindqvist and Östling (2010) in their analysis of the size of government. The data sample here is a cross section of quite diverse countries.[3] The scatter plot reveals a negative raw correlation between polarization and debt. Prima facie this is supportive of the argument advanced in the present paper, and somewhat contrary to the strategic debt literature. Nonetheless it is not possible to infer causality for the standard reason that analysis of cross-country performance omits considerable unobserved heterogeneity.

Below the competing hypotheses are tested using time-varying polarization measures generated from ideology data from political manifestos and observed voting behaviour. One important feature of these data is that they vary over time. Previous analyses of the relationship between fiscal policy and ideological polarization have only used cross-sectional analysis, or in the context of panel data has relied on fixed measures of ideology for party positioning—wherein time variation is generated through variation in seats.[4] Within countries the distance between parties is not fixed over time; hence, the data used here represent an improvement over the previous work. Within-country variation also allows us to control for unobserved fixed country-specific characteristics that might drive debt.

The econometric analysis consistently finds a statistically significant negative relationship between central government debt and ideological polarization in voter

[2] Persson and Svensson (1989) model preference heterogeneity over total government expenditure whilst Alesina and Tabellini (1990) focus on the composition of expenditure. In support of Persson and Svensson (1989) Pettersson-Lidbom (2001) finds that right-wing governments increase debt whilst left-wing governments reduce debt when faced with the likelihood of being replaced. However this is a different, and not mutually exclusive, hypothesis from that pertaining to the ideological distance between the two parties. For example in Persson and Svensson's (1989) model the impetus for debt (given a conservative incumbent) is stronger when the ideological distance between the two parties is bigger.

[3] The econometric analysis below focuses only on established OECD democracies for three reasons. First, both our model and the strategic debt literature rely on democratic processes. Second, debt default concerns have generally been greater outside the OECD. Third, over a meaningful time-span the manifestos data, which we exploit to generate time-varying ideological dispersion (polarization) measures, are only available for the OECD sample.

[4] For example Alt and Lassen (2006). Relatedly Volkerink and de Haan (2001) and Perotti and Kontopoulos (2002) use cross-sectional policy to investigate the effect of fragmented government on fiscal policy.

preferences. The relationship is robust to the inclusion of a number of controls and, in particular, is strengthened when a measure of fragmentation (which is distinct from polarization) is included. In contrast to the strategic debt literature we find that it is ideological dispersion in the electorate, rather than ideological distance between the government and their potential replacement, that correlates with debt. A one standard deviation increase in polarization correlates with lower central government debt by about 12% of GDP. To identify exogenous variation in polarization, we use lagged media penetration data and also the impact of the fall of the Berlin Wall on European politics. Campante and Hojman (2013) and Melki and Pickering (2014) both argue for a causal relationship from increased media penetration to reduced polarization. Using the alternative instrumental variables the results hold up in support of a causal negative relationship between polarization and debt.

Furthermore, the negative relationship between debt and polarization is found to be stronger when 'government efficiency' is weaker. This latter variable is defined by institutional independence from political pressures. As such we would expect a priori that governments scoring highly on this measure would be more able to resist voter demands for debt. The data thus also support this line of reasoning. The negative relationship is also found to be especially strong when fiscal transparency is high. Whilst the 'treatment' of transparency is evidently far from random, this evidence can also be reconciled with the argument that electoral pressure for debt when there are many swing voters (i.e. when preferences are not polarized) is particularly strong when voters are more able to attribute fiscal policy outcomes to the incumbent.

The paper contributes to the growing literature examining the economic consequences of political polarization. Azzimonti (2011) theorizes that the common pool problem in public service provision is exacerbated, causing higher taxes and lower growth, and Woo (2003, 2005) and Azzimonti and Talbert (2014) find increased policy variability and hence subsequent greater macroeconomic volatility. Canes-Wrone and Park (2012) argue for a 'reverse political business cycle' in which uncertainty over the future policy environment increases with polarization thus dampening investment prior to elections.

On the other hand, Testa (2010 and 2012) and Brown et al (2011) theorize that polarization can reduce corruption. Melki and Pickering (2020) find supportive evidence for this hypothesis using data from the USA. The findings in the present paper are compatible with this literature. The basic argument here is that polarization can weaken electoral competition and in doing so act to reduce policy failures that can emerge from the political process.[5]

The next section develops the theoretical argument, Sect. 3 contains the empirical analysis and Sect. 4 concludes.

[5] Relatedly Schultz (2008) also models voters as poorly informed, finding conditions under which longer term lengths (hence reduced accountability) can be an optimal way of reducing policy distortions.

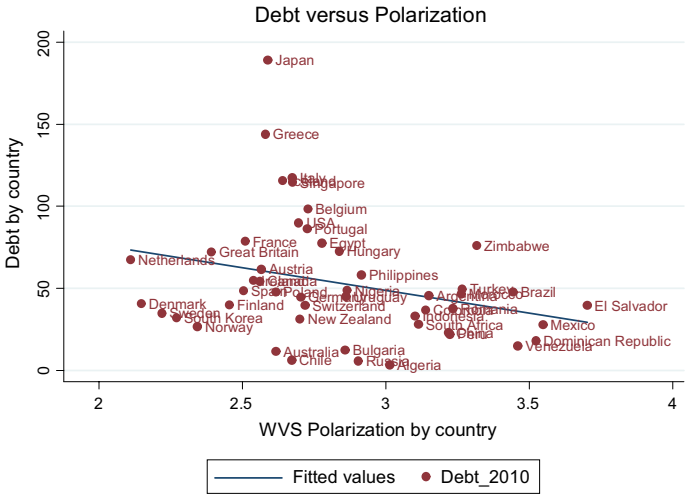

Fig. 1 Scatter plot of central government debt as a percentage of GDP in 2010 and ideological polarization by country. Ideological polarization is measured using the standard deviation of the 'Gov' question in the World Values Survey (see Lindqvist & Östling, 2010)

2 Theoretical mechanisms

Alesina and Tabellini (1990) exposited the now seminal proposition of 'strategic debt'. In this model the incumbent has preferences over policy, for example preferring welfare provision to tax cuts and anticipates possible replacement by an ideologically distinct successor government. By increasing debt the incumbent gets more of the public good that they like today and limits the capacity of its successor to pursue its own agenda in the next period as they will inherit the debt obligation. In this instance the relevant measure of polarization is the ideological distance between the incumbent and its successor and we have hypothesis 1 (H1):

H1 (Strategic debt): Debt will increase the greater the ideological distance between the incumbent and its likely replacement.

Nonetheless both incumbent and opposition parties' ideological positioning are endogenous to the preferences of the electorate, and the wider political economics literature identifies many potential mechanisms through which these preferences and in particular their dispersion affects policy. This matters when candidates are office-motivated, rather than policy-motivated as in the strategic debt model.

Probabilistic voting models are a standard workhorse of this literature and in these greater dispersion of preferences in general acts to dull the responsiveness of voting to economic policy.[6] When the electorate is ideologically concentrated the number of swing voters is greater and pleasing them materially brings greater

[6] Persson and Tabellini (2000) discuss these models and their widespread use in the discipline.

electoral reward. An important premise for this paper is that the incentives for policymakers to increase debt are potentially sharpened. Conversely if the electorate is ideologically polarized then voter-responsiveness to economic policy, and in turn the electoral incentive to increase debt, are both reduced.[7]

A frequent complaint of the public choice literature is that political decision-making is short-termist and by construction short-termist policy entails higher debt levels.[8] A plausible source of this myopia is the electorate. Voters may discount public debt for a number of reasons. One possibility is imperfect information. Voters may not incur the cost of becoming fully informed about the state of public finances when the expected benefits of voting are vanishingly small. Buchanan and Wagner (1977) argue that voters suffer from 'fiscal illusion', in part induced by complexities in the fiscal system, and in part induced by 'rational ignorance' (Downs, 1957 & Tullock, 1967).[9]

Even under the strong assumptions of fully rational voters and transparent public accounts, the relevant borrowing data do not become available before a substantial lag and are then usually subject to further historical revisions.[10] Cimadomo (2012) documents sizable and persistent differences between real time and end-of-sample data for the public debt-output ratio, so even motivated voters may not know even the direction of debt under a particular regime with confidence. As well as genuine measurement difficulties Alt and Lassen (2006) document that public finances in many OECD countries are not wholly transparent. Even if voters were willing to incur the processing costs, the relevant information simply may not be available.

Relatedly Rogoff (1990) and Rogoff and Sibert (1988) show that under circumstances of imperfect information, competent incumbents increase debt in order to distinguish themselves.[11] However, and as with probabilistic voting models in general, the capacity to improve the election-win probability through spending (and increased debt) falls under more polarized preferences as voters become less responsive to spending.

Alternatively public debt may just be electorally popular. Such debt is typically paid back over decades, and many voters (in particular retirees, with notably higher than average turnout rates) simply may not be around in the future.[12] There may be bequest motives, and aversion to private debt, within households, but in the context

[7] Relatedly, Adams et al.(2017) show that non-moderate voters weight candidates' ideological positions far more than moderate voters using survey data from the 2010 Cooperative Congressional Election Study. Arguably greater polarization means less moderate voters, hence a greater weight on ideology and a lower weight on material concerns.

[8] Acharya and Rajan (2013) analyse the default decision when governments are myopic.

[9] As an example of low general knowledge concerning public finances, about 59% of Americans told in a Washington Post/ABC News poll in 2013 that they believed that the federal deficit was growing whilst at that time it was not.

[10] See Irwin (2015) on the substantial difficulties of providing accurate contemporaneous public debt data.

[11] Aidt et al. (2011) find evidence from Portuguese municipalities in favour of this mechanism.

[12] Song et al. (2012) also make this argument. In the empirical work below, public debt levels are found to be robustly correlated with the proportion of the population aged 65 and over. Alternatively Cukierman and Meltzer (1989) derived demand for public debt from `bequest-constrained' individuals.

of reducing public debt the bequest would implicitly be to society at large. Voters might conceivably discount the benefits of reducing public debt when they are spread across the population.

The argument that voters discount future debt should be recognized as distinct from traditional (opportunistic) models of pre-electoral spending and post-election retrenchment (Nordhaus, 1975).[13] Ultimately neither 'opportunistic' nor 'rational' theories of spending cycles can explain variation in debt levels averaged over longer periods of time (i.e. including both election and non-election years). The time frame we have in mind for debt decisions is the long-run—in other words beyond electoral terms of office. Systematic discounting of public debt by the public, either founded in imperfect information or direct preferences, provides an impetus for explaining observed public debt levels.

The general lesson of the probabilistic voting literature is that greater dispersion in voter preferences dulls the electoral response to particular economic policies. If we also take the premise of short-termism in the electorate, then the vote-payoff to increased debt is reduced and we have hypothesis 2 (H2):

H2 (Electoral motives): Debt will fall with greater ideological dispersion in voter preferences.

3 Evidence

3.1 Data and empirical strategy

The dependent variable, taken from Reinhart and Rogoff (2011), is total (domestic plus external) gross central government debt measured as a percentage of GDP.[14] The sample covers the period 1945–2010 in countries which have been OECD members since 1975. The mechanism proposed in this paper, and also in the strategic debt literature, both emphasizes electoral concerns and hence established democracies are the appropriate sample.

Figure 2 depicts these data, showing interesting variation across countries and over time. First in general the debt data, as would be expected for a stock variable, are clearly quite slow moving. Second, it is clear is that there are important universal time effects. Many countries ended the Second World War with large debt

[13] Rogoff and Sibert (1988) and Rogoff (1990) restore voter rationality to this analysis using a signal-extraction model when inferring incumbent competence. Recent empirical work on the presence of electoral deficit cycles in OECD countries is fairly mixed (Brender & Drazen, (2005); Shi & Svensson, (2006)).

[14] Empirical work in this broad area focusses on the primary surplus rather than debt levels (e.g. Alt & Lassen, 2006; Persson & Tabellini, 2003). We prefer actual debt levels as a dependent variable because the primary surplus is defined as tax revenue minus expenditure before interest payments on debt are made. Given the presumption of solvency (which characterizes the OECD for most of the time), then countries with higher steady state debt levels are more predisposed towards a primary surplus. The primary surplus data therefore may quite often be systematically misleading in terms of representing chosen levels of public debt.

obligations. In 1946 average public debt levels in the sample stood at 93% of GDP. Debt levels then fell as a percentage of GDP as they were paid off, and of course as GDP itself rose relatively quickly over the subsequent three decades, with average debt levels reaching their minimum (at 23.6% of GDP) in 1974. Since that time public debt as a percentage of GDP has increased, for instance quite markedly following the financial crisis of 2007/2008, rising to 69.4% in 2010, the most recent year for which data are available. There is also interesting cross sectional variation. Taking the whole sample period, public debt in Germany and Switzerland, respectively, averaged at 18.3% and 21.5%, whilst the averages for Great Britain and Belgium are, respectively, 78.1 and 78.6%. It seems reasonable to infer that debt aversion is not constant across countries.

The key explanatory variable, ideological polarization, is constructed using ideological data produced by the Manifestos Research Group (Budge et al., 2001, and updated by Klingemann et al., 2006).[15] This source derives a unidimensional left–right ideology score produced at the level of the party, which varies across time (as manifestos of particular parties change per election), denoted rile_{pjt} for party p in country j in year t, which in principle varies between -100 (extreme left) and $+100$ (extreme right). Within the OECD sample the leftmost observation, with a rile measure of -68.1, is the Danish Socialist People's Party in 1960, whilst the rightmost observation is the Australian Country party in 1954, with a rile measure of 85. To construct a measure of polarization in voter preferences (POL) in an election year within a particular country we estimate the standard deviation of underlying ideology distribution using the formula

$$POL_{jt} = \sqrt{\sum_{p} V_{pjt}\text{rile}_{pjt}^{2} - \left(\sum_{p} V_{pjt}\text{rile}_{pjt}\right)^{2}}$$

where V_{pjt} is the proportion of votes received by party p in the election. Thus in a two-party system ($p = \{L, R\}$) where both parties get 50% of the vote, and $\text{rile}_L = -10$ and $\text{rile}_R = 10$, then the standard deviation is 10. If the parties' respective ideology move to $\text{rile}_L = 10$ and $\text{rile}_R = 30$, holding vote shares constant at 50%, then the standard deviation is unaltered. If $\text{rile}_L = 10$ and $\text{rile}_R = 50$, then the standard deviation increases to 20. Data for non-election years were obtained through linearly interpolating between the nearest election years. In the empirical analysis we also utilize the mean ideology, constructed analogously according to $MEAN_{jt} = \sum_{p} V_{pjt}\text{rile}_{pjt}$.

[15] The manifestos data pass various external validation tests. For example country level averages of these data show that the Scandinavian countries are on average substantially more left-wing than say the US or Australia. Average ideology in Anglo Saxon countries such as the UK exhibit a marked drift to the right in the 1980s. Gabel and Huber (2000) argue that the MRG data are a good measure of ideology, as they correspond well with other data sources such as expert surveys (e.g. Castles and Mair (1984)) and data from the World Values Survey (WVS). Pickering and Rockey (2011) use the manifestos data to explore the relationship between government size, ideology and economic development.

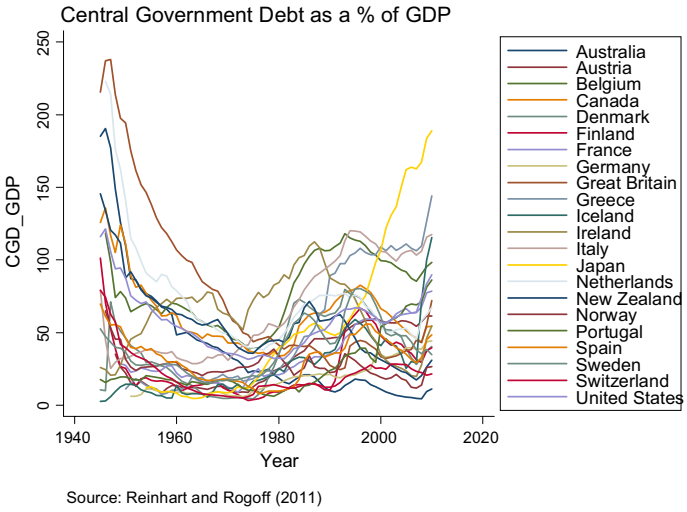

Fig. 2 Central government debt as a percentage of GDP

The resulting series for POL_{jt} demonstrate interesting variation across time and space. The mean value for POL_{jt} is 17.0 and its standard deviation is 6.95. The least polarized election in the sample was the German election of 1965 ($POL_{jt} = 2.47$). At face value this perhaps reflects the consensual approach to politics in this country following the Second World War.[16] The most polarized election was the Finnish election of 1945 ($POL_{jt} = 43.23$)—this latter case reflects the presence of a politically strong communist party (the Finnish People's Democratic League) together with overtly anti-Soviet centrist and right-wing movements that prioritized Finnish sovereignty.

A key advantage of the polarization measures used in this paper is that they vary across time as well as across countries. Hence, differences in the level of debt that may be due to time-invariant unobservable country characteristics (for example such as 'German debt aversion') may be controlled for via the use of fixed effects. In the UK, for example, politics were fairly polarized at the point of the 1945 general election,[17] and this shows up in the data as $POL_{jt} = 21.4$. The measure proceeded to decline, reflecting the 'post-war consensus' and in the 1959 general election POL_{jt} reached its UK minimum of 4.32. An ideological divide started to re-emerge in the 1970s peaking in 1983 at 28.3, reflecting Thatcher's drive to the right, and Labour's continued adherence to generalized public ownership then embodied in Clause 4 of its own constitution. More latterly, with the emergence of New Labour, polarization has declined, with POL_{jt} in single digits so far through the twenty-first century.

[16] (Although closer examination of the data reveals quite a lot of variation within West Germany: for example in 1957 $POL_{jt} = 34.57$.).

[17] In 1945 the elected Labour party embarked on a significant expansion of the welfare state and meaningfully differed in ideology from the Conservative party, led by Winston Churchill.

Nonetheless it is also the case that, like the debt data, POL_{jt} demonstrates considerable persistence. Both party level ideology $\left(\text{rile}_{pjt}\right)$ and voting behaviour are persistent, and so the usable variation in this series is in the longer run.

Alternative polarization measures, for example generated from the World Values Survey (WVS),[18] essentially represent a snapshot of a country at a given moment hence will not capture within-country variation across time. Nonetheless, the WVS permit a validation test of the POL_{jt} measure used here. In particular the most recent WVS contains a question which asks 'In political matters, people talk of "the left" and "the right." How would you place your views on (a 1–10 Likert) scale, generally speaking?'. The correlation of the standard deviation of this measure with the country-level average POL_j is 0.52. Countries which on average are measured to be more polarized according to our measure are also more polarized according to the WVS.

The variable POL_{jt} is used in order to test *H2* that reduced dispersion of preferences implies greater political competition and hence greater debt levels when current spending is rewarded. However, as discussed above polarization as conceived in the strategic debt literature is distinct, in that it refers to distance between parties rather than dispersion in the electorate. In essence the further the incumbent from their expectation of future policy, the greater the level of debt. In order to separately test the strategic debt hypothesis a separate 'government distance' (GOV_DIST_{jt}) measure is also used in the empirical analysis. This is measured as the absolute distance between a weighted measure of government ideology and mean ideology in the electorate $MEAN_{jt}$ defined above.[19] The maintained assumption here is that the current ideological mean in the population proxies for the expectation of the ideological disposition of future regimes. The correlation between POL_{jt} and GOV_DIST_{jt} in the annual data is 0.427; hence, the two are positively correlated as would be expected, but there is also some usable variation. Governments that are more distant from mean ideology are more prevalent when the electorate is more dispersed. In addition to this measure we also make use of the ideological distance between the two main parties ($TOP2\_DIST_{jt}$) and also the unweighted standard deviation of the rile_{pjt} ideology measure by all parties standing at each general election (denoted $RILESD_{jt}$).

Figure 3 plots average debt levels within countries against averages of the polarization measure POL_j. This figure, like Fig. 1, is of course only suggestive, but taken at face value is again supportive of the hypothesis offered in this paper, that polarization may reduce debt. Furthermore, the fact that Figs. 1 and 3 are consistent with each other supports the use of the manifesto-generated polarization data. The slope coefficient in Fig. 3 is equal to−2 (with a p-value of 0.07); hence, a permanent one standard deviation (6.95) increase in polarization is statistically associated with a reduction of central government debt of 13.9% of GDP.

[18] Lindqvist and Östling (2010) analyse the effect of polarization on the size of government using cross-sectional measures derived from the WVS.

[19] The weights are defined by the seat shares of the parties formally represented in government. Data for the parties in government were taken from the Database of Political Institutions.

Figure 4 plots the evolution of cross-country year level averages of debt levels and polarization, POL_t.[20] Clearly debt levels have trended upwards over time since 1960, whilst average polarization has declined. Broadly speaking the early part of the sample is characterized by low debt and high polarization, whilst the latter part of the sample is characterized by high debt and low polarization.[21] In a simple bivariate regression the slope coefficient is equal to -3.97 (with a p-value of 0.003). Again, this figure certainly cannot be taken as evidence of a causal relationship. Nonetheless, the facts are at least consistent with the interpretation offered in this paper.

To investigate this relationship in more depth we turn to a regression analysis. Certain countries may be more debt averse than others, perhaps for historical reasons. Likewise common time effects are also obviously important. If international borrowing rates increase, or business cycles and indeed growth are at all synchronous, then debt levels may rise simultaneously across countries. For these reasons both fixed and time effects are included as standard in the regression analysis.

The regression analysis also includes standard control variables, following Persson and Tabellini (2003) in their analysis of central government primary budget surplus data. In particular we control for the natural log of real GDP per capita in constant dollars (chain index),[22] the degree of trade openness,[23] the percentage of the population aged between 15 and 64, and the percentage of the population aged 65 and above.[24] The benchmark empirical specification is thus

$$D_{jt} = b_1 POL_{jt} + [\text{controls}]b\prime + \mu_i + \mu_t + \varepsilon_{jt}$$

where D_{jt} is central government debt as a percentage of GDP in country j in year t. b_1 is the principal parameter of interest. The hypothesis proposed here is that debt falls with polarization (POL_{jt}), hence $b_1 < 0$, rather than $b_1 > 0$ in the case of Alesina and Tabellini (1990). The vector of controls are augmented with fixed effects, μ_i and time effects μ_t. In addition all estimation results are reported with standard errors clustered by country.

3.2 Ordinary least squares regression results

Column 1 of Table 1 presents the results of the benchmark estimation specification using annual data. The parameter estimate for b_1 is somewhat smaller than in the raw correlations though remains, consistent with the theory above, negative and significant with a p-value of 0.07. The negative statistical association survives in the presence of fixed country and year effects, as well as the control variables. These results

[20] Whilst the debt and ideology data go back to 1945, the control variables are only available from 1960 hence the formal econometric analysis focuses on the period 1960–2010.

[21] One driver of the fall in average polarization is the decline of the European radical left after 1989 (March & Mudde, 2005).

[22] Following Persson and Tabellini (2003) these data were obtained from the Penn World Tables.

[23] Measured as the sum of exports and imports divided by GDP. Source: World Bank World Development Indicators (WDI).

[24] Data for the demographic controls were also obtained from the WDI.

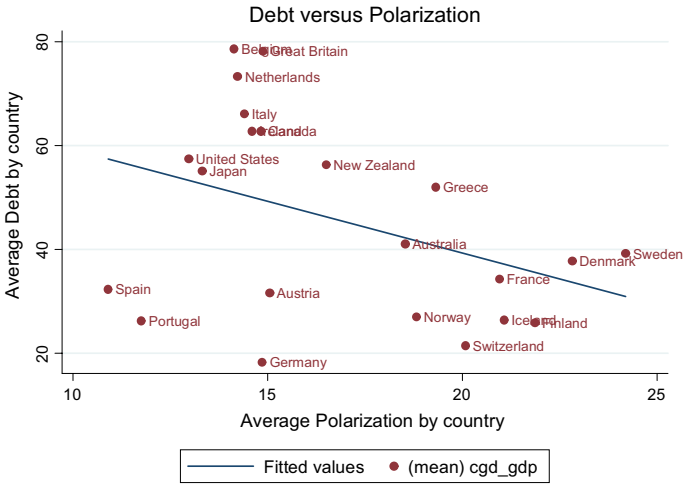

Fig. 3 Scatter plot of average central government debt as a percentage of GDP and average ideological polarization by country (using manifesto-generated ideology data)

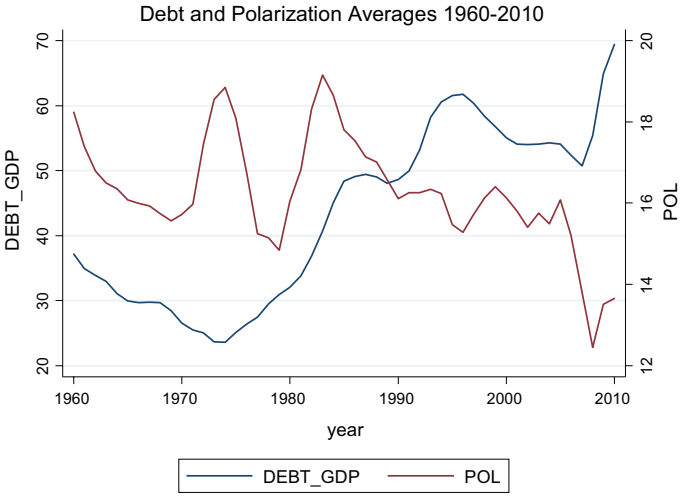

Fig. 4 Evolution of average central government debt as a percentage of GDP (DEBT_GDP) and average ideological polarization (POL) by year

imply that a one standard deviation reduction in polarization is associated with an increase in central government debt of 3.44% of GDP. On the other hand, the mean ideological climate has no statistical relationship with debt. It is also noteworthy that amongst the control variables, the standout driver of debt is the proportion of persons aged 65 and over, consistent with Song et al (2012).

Column 2 of Table 1 includes the measure of government distance, *GOV_DIST*, described above. According to the strategic debt hypothesis the

Table 1 Estimation results, annual data

	(1)	(2)	(3)	(4)	(5)
MEAN	−0.103 (0.189)	−0.164 (0.196)	−0.164 (0.202)	−0.148 (0.189)	−0.076 (0.197)
POL	−0.495* (0.259)				−0.484* (0.238)
GOV_DIST		−0.220 (0.141)			−0.114 (0.114)
TOP2_DIST			−0.095 (0.108)		
RILESD				−0.257 (0.208)	
LYP	−0.001 (0.001)	−0.001 (0.001)	−0.001 (0.001)	−0.001 (0.001)	−0.001 (0.001)
TRADE	−0.009 (0.228)	−0.015 (0.227)	0.025 (0.237)	0.007 (0.231)	−0.035 (0.227)
PROP1564	−1.213 (1.567)	−1.182 (1.682)	−1.506 (1.619)	−1.284 (1.600)	−1.072 (1.672)
PROP65	7.877*** (2.021)	7.617*** (1.956)	7.628*** (2.032)	7.728*** (2.007)	7.826*** (2.023)
Obs	1025	986	1016	1025	986
Data	Annual	Annual	Annual	Annual	Annual
No. countries	22	22	22	22	22
Method	OLS	OLS	OLS	OLS	OLS
R^2	0.71	0.70	0.70	0.70	0.71

Panel regressions of Central Government Debt as a percentage share of GDP including *LYP*, *PROP1564*, *PROP65*, and *TRADE* as control variables described in Persson and Tabellini (2003). *POL* is the measure of ideological polarization in the electorate as described in the text. *MEAN* is the average left–right ideological score. *GOV_DIST* is the ideological distance between the government and the mean voter, *TOP2_DIST* is the ideological distance between the top two parties (by vote) in the election, *RILESD* is the standard deviation in ideological positioning by all the parties standing in the election. Fixed country and time effects are included. Standard errors (reported in parentheses) are estimated by clustering errors by country. *, **, and ***, respectively, denote significance levels at 10%, 5% and 1%

coefficient estimate on this variable should be positive. All else equal the larger the difference between the ideological disposition of the government and the ideological mean in the electorate, the greater the incentive for the government to increase debt. However, the estimated coefficient for this variable is negative (though insignificant), whilst the coefficient estimate pertaining to POL is essentially unaltered in terms of size and significance. Similar findings hold in columns 3 and 4, where *GOV_DIST* is replaced by the top two-party distance measure (*TOP*2*_DIST*) and also the unweighted standard deviation of the rile_{pjt} ideology measure by all parties standing at each general election (denoted *RILESD*). The absence of evidence in support of the strategic debt hypothesis also holds in column 5 where again the estimated coefficient for *GOV_DIST* is negative (though insignificant), whilst the coefficient estimate pertaining to *POL* is essentially unaltered in terms of size and significance.

Whilst indicative, the econometric results using annual data are potentially questionable because both government debt and ideological dispersion are slow moving variables. By construction government debt is the cumulative outcome of past and present deficits. The fiscal policy decision-making process is not instantaneous. Governments have to agree to proposals and then get them through

legislative processes. Second, there are considerable lags in the implementation of agreed policy. In large part policymakers inherit fiscal policy in terms of tax rates and thresholds as well as with particular spending commitments even in the case of the discretionary elements of fiscal policy. Furthermore, there are important cyclical effects in the context of annual debt data. To overcome this problem, and following the standard approach taken in the empirical growth literature from here on we report results using 10 year averages of the data.

A further reason for taking 10 year averages is that the polarization data are undoubtedly measured with some error. For example, if a particular party publishes a relatively idiosyncratic (and perhaps unrepresentative) manifesto for a particular election, thereby failing to adequately represent the parties' underlying ideological position, then averaging the data with adjacent elections will improve the quality of the ideology data. Table 2 therefore repeats the analysis of Table 1, but using 10 year averages. Despite a smaller number of observations, the estimation results hold up and indeed improve in terms of estimated parameter magnitude and statistical significance (as would be expected if the polarization measure is improved). The estimate for b_1 is now -0.970 and is significant at the 5% level.

As in Table 1 the estimation results are quite unsupportive of the strategic debt hypothesis. The alternative polarization measures (in columns 2–4) find coefficient estimates with the wrong sign, though are statistically insignificant. Column 5 again adds *GOV_DIST* as an additional regressor. As with the annual data government distance from the mean is found to be negatively (though insignificantly) correlated with government debt; hence, the data are not supportive of the strategic debt hypothesis. Inclusion of this variable in the context of the 10-year averages data also leads to a slight drop in the estimated significance of *POL*, although the point estimate is not significantly different. It is possible that *GOV_DIST* is picking up some of the polarization effect as argued for in this paper. Most importantly in this and indeed in all subsequent regressions *GOV_DIST*, *TOP*2_*DIST* and RILESD were all found to be insignificantly related to debt and so are dropped from the analysis.

Previous empirical work investigating political determinants of fiscal policy has focussed on the common pool problem—which increasingly arises when the government is constituted of broader coalitions of interest groups.[25] For example, Perotti and Kontopoulos (2002) empirically investigate how fragmentation leads to 'loose fiscal outcomes'.[26] Fragmentation, which should be recognized to be quite distinct from polarization, is usually defined empirically in terms of the number of political actors.[27] However, because fragmentation and polarization are correlated with each other (the correlation coefficient is 0.23) omission of fragmentation may bias the polarization parameter estimate towards insignificance. In Table 3 column 1 we

[25] Weingast et al. (1981) explore how government resources are misallocated under the common pool problem. Alesina and Drazen (1991) and Velasco (2000) analyse the implications for debt.

[26] Persson and Tabellini (2003) investigate constitutional rules and find that the average government fiscal cash surplus is higher under majoritarian electoral rule compared with proportional representation in cross-sectional data.

[27] See also Volkerink and de Haan (2001) and Elgie and McMenamin (2008).

include the number of parties in government (NPC) following this literature. A priori, the larger this number, the worse the common pool problem and the greater the public debt. The results confirm this hypothesis, with the parameter estimate relating to NPC exhibiting a positive sign, and which is significant at the 10% level. The magnitude of this estimated effect is quite large. An additional party in government is estimated to increase debt by 8.4% of GDP. Importantly the parameter estimate for POL is still negative and significant, indeed more so now that fragmentation is separately controlled for.

The presence of fixed country and time effects goes some way towards controlling for unobserved determinants of government debt. However, it is possible that unobserved country-specific effects may be time varying, and indeed that time effects are heterogeneous impact by country. To further control for unobserved country and time-specific factors the econometric analysis is next augmented to include the lagged-dependent variable. Furthermore, even within 10-year averages there is likely to be some persistence in the dependent variable that ideally should be accounted for in the analysis. Column 2 in Table 3 contains the results. The point estimate of b_1 remains negative and is still statistically significant even in this quite demanding econometric specification.

It is possible that column 2 underestimates the effect of ideological polarization on public debt, due to the Nickell (1981) bias associated with models that include fixed effects and have a lagged-dependent variable. The bias is in the order $1/T$, and when decadal data are used $T = 5$, so this is an important consideration. To correct for this column 3 employs the Bias-Corrected Least Squares Dummy Variable (BCLSDV) estimator proposed by Kiviet (1995) and extended by Bruno (2005). The relationship between polarization and public debt remains negative and is now estimated to be significant at the 5% level.

3.3 Instrumental variable regression results

The results presented so far establish a robust negative statistical relationship between public debt and ideological polarization—one that survives in the presence of a substantial battery of controls. However, endogeneity is still a concern here: possibly both variables co-move in response to an unseen third variable. Ideally what is required here are plausibly exogenous movements in polarization. In an attempt to identify such movements we employ two instrumental variables. The first of these is lagged media intensity, measured as the average number of televisions owned in the population in the previous 10-year period.[28] In the case of the US Campante and Hojman (2013) found that the introduction of TV in the USA causally reduced ideological polarization. Using international data Melki and Pickering (2014) also found that increases in media intensity statistically lead observed reductions in polarization. In the context of using 10-year averages, there is also

[28] These data are from the World Development Indicators.

Table 2 Estimation results, 10-year averages

	(1)	(2)	(3)	(4)	(5)
MEAN	−0.291 (0.397)	−0.472 (0.393)	−0.370 (0.202)	−0.412 (0.380)	−0.303 (0.413)
POL	−0.970** (0.259)				−0.878* (0.453)
GOV_DIST		−0.446 (0.425)			−0.122 (0.456)
TOP2_DIST			−0.274 (0.193)		
RILESD				−0.453 (0.419)	
LYP	−0.001 (0.001)	−0.001 (0.001)	−0.001 (0.001)	−0.001 (0.001)	−0.001 (0.001)
TRADE	−0.053 (0.228)	0.004 (0.322)	−0.043 (0.325)	−0.017 (0.314)	−0.051 (0.316)
PROP1564	−2.054 (1.894)	−2.272 (1.938)	−2.218 (1.980)	−2.228 (1.977)	−2.037 (1.919)
PROP65	9.198*** (2.417)	8.920*** (2.302)	9.056*** (2.297)	8.914*** (2.390)	9.199*** (2.420)
Obs	106	106	106	106	106
Data	10-year aves	10-year aves	10-year aves	10-year aves	10-year aves
No. countries	22	22	22	22	22
Method	OLS	OLS	OLS	OLS	OLS
R^2	0.77	0.77	0.77	0.76	0.77

As for Table 1. *, **, and ***, respectively, denote significance levels at 10%, 5% and 1%

Table 3 Estimation results—robustness

	(1)	(2)	(3)
MEAN	−0.299 (0.359)	0.061 (0.259)	0.187 (0.277)
POL	−1.310 ** (0.509)	−0.766 * (0.433)	−0.670 * (0.358)
LYP	−0.001 (0.001)	−0.001 (0.001)	−0.001 (0.001)
TRADE	−0.203 (0.291)	−0.298 (0.226)	−0.317 (0.165)
PROP1564	−1.750 (1.894)	−0.619 (1.160)	−0.181 (1.085)
PROP65	9.114 *** (2.318)	6.664 *** (1.736)	5.833 *** (1.416)
NCP	8.418 * (4.049)	3.113 (4.489)	1.725 (2.651)
D_{jt-1}		0.553 *** (0.085)	0.748 *** (0.094)
Obs	106	106	106
Data	10-year aves	10-year aves	10-year aves
No. countries	22	22	22
Method	OLS	OLS	BCLSDV
R^2	0.79	0.87	

As for Table 1. *NCP* is the number of parties in government coalition. D_{jt-1} is the lagged-dependent variable. *, **, and ***, respectively, denote significance levels at 10%, 5% and 1%

a substantial time gap between the media instrument and the polarization data so clearly the instrument is predetermined.

The second instrument is the fall of the Berlin wall in 1989. This event clearly satisfies the conditions of exogeneity and plausibly had a sizeable effect on ideological polarization, especially in Europe. Prior to this event parties of the left in Europe usually explicitly defined themselves as socialist, whilst parties of the left in democracies outside of Europe (e.g. the USA) were generally more centrist. The event was a decisive signal, in simple terms, that communism had failed. As such, voters and indeed parties of the left in Western Europe shifted somewhat to the right. Indeed March and Mudde (2005) find that the decline of the 'radical left' in Europe dated from 1989. This implies an exogenous compression of ideology in European countries. Figure 5 depicts the polarization data in terms of deviation from the mean across time. Polarization towards the end of the sample falls in both the European and non-European subsample, but the reduction is greater in the European countries. This instrument is constructed as a dummy variable set equal to one in European countries post-1989 and zero elsewhere. The presence of a second instrument (that undoubtedly is independent of the first) also permits use of overidentification tests to investigate the exclusion restrictions.

Table 4 contains the estimation results of the instrumental variables regression. The weak instruments test is rejected at the 1% level.[29] Both the Sargan and Basman overidentification tests are not rejected, which supports the assumptions of instrument exogeneity, and the associated exclusion restrictions. Importantly polarization is still found to be negative and statistically significant, and indeed the magnitude of the estimated coefficient is increased relative to the OLS estimates. This is quite plausible if, for example, debt increases in 'bad times', which simultaneously entails greater polarization. The 'bad times' are not fully controlled for in the OLS regression and would bias the OLS estimate towards zero. When polarization is instrumented, then any endogenous element of polarization is in principle cleaned out, and a clearer picture emerges of how exogenous changes in polarization affect chosen debt levels. The estimated coefficient is -1.7, not far from the slope (-2) in the scatter plot in Fig. 2. Under the conditions of instrument validity, then the estimated quantitative effect is quite sizeable: a one standard deviation increase in polarization is estimated to cause a reduction of central government debt of about 12% of GDP.

3.4 Robustness and mechanisms

Table 5 investigates robustness and also whether or not the results reported thus far change with economic development and government institutions. The mechanism proposed in the paper relates to democracy, and feasibly under non-democratic systems the relationship between polarization and government debt could be quite different. The sample analysed in this paper is the OECD—hence only relates to democratic systems, though countries do differ in terms of the maturity of their

[29] In the first stage regression lagged media is negative and significant with a p-value of 0.002, and the Berlin wall dummy is negative and significant with a p-value of 0.058.

democracies. In column 1 the regression specification is as for column 1 of Table 3 but the sample excludes observations from Greece, Portugal, and Spain from the 1970s, which were all then new democracies. As can be seen the results are essentially unaltered given their exclusion.

Columns 2 and 3 of Table 5 split the sample by economic development.[30] The theory is silent on this point, but generally voter and politician behaviour may vary with development, and it is in any case useful to gauge whether parameter estimates are stable across these subsamples. In column 2 the (relatively) high-income sample again returns a negative coefficient for polarization of a very similar magnitude to that found for the full sample. Statistical significance falls slightly to 7.6% though this is not surprising given the smaller sample. In column 3 the (relatively) low-income sample also returns a negative coefficient, which despite increased magnitude is of reduced statistical significance ($p = 0.162$). The debt–polarization relationship is somewhat looser under lower economic development, but overall these results do not indicate that the parameter estimates depend on the level of development.

The core argument of the paper emphasizes the need to signal competence via higher current spending. Excessive government debt arises out of a political process with information asymmetries. Both in principle and in practice there may be institutional defences against the debt distortion. In order to investigate this empirically we make use of the 'Government Efficiency' (*GOVEF*) data produced by Kaufman et al (2009). These data 'captur(e) perceptions of *the quality of public services, the quality of the civil service and the degree of its independence from political pressures*, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies'.[31] We believe this institutional measure (or its objective at least) should in principle qualify the capacity for incumbents to suboptimally increase debt. In particular, a high quality and independent civil service may be more able to make financing decisions independently and indeed resist short-termist political demands for debt. Consequently, albeit somewhat tentatively, it may be hypothesized that countries which score highly on this measure might exhibit a weaker debt–polarization relationship than those which do not.

The *GOVEF* data are only available from 1996 to 2012. Furthermore, there is not much in the way of within-country variation.[32] To make matters simple we take the average *GOVEF* score for each country, rank them in order, and then divide the sample of 22 countries into two groups of 11 thereby creating a low government efficiency subsample and a high government efficiency subsample. This ordering and grouping can be seen in Table 6. Globally these data in principle range from -2.5 to $+2.5$, and there is quite a lot of variation even across the OECD sample on this measure. Columns (4) and (5) of Table 5 contain estimation results for these two subsamples. Column (4) is the high government efficiency group of countries. Here

[30] Determined by the median value of real GDP per capita.

[31] Kaufman et al. (2009). Italics added.

[32] This is not surprising given that the measure is a function of institutional quality, and that institutions are slow to change.

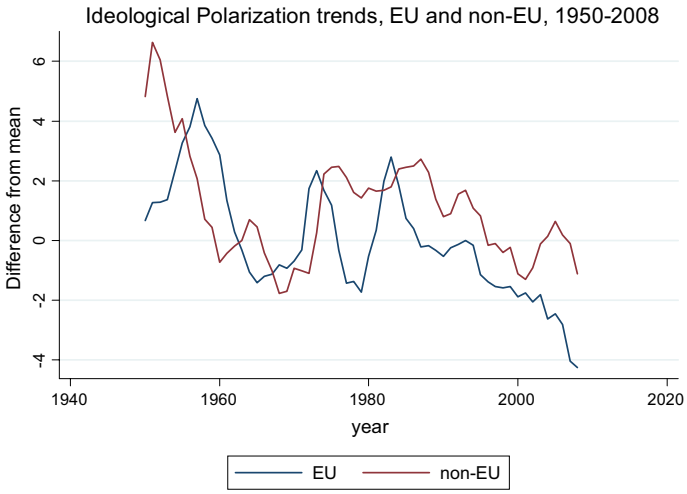

Fig. 5 Ideological Polarization trends, EU and non-EU, 1950–2008. The series are constructed as follows: First, within each country demeaned polarization data are constructed by subtracting the country-level average from each observation to remove country-specific fixed effects. Second, the demeaned series are averaged across each geographic area for each year.

the estimated relationship between debt and polarization, whilst still negative, is now much reduced in terms of statistical significance ($p = 0.268$). In the low government efficiency group of countries (column 5) the parameter estimate is much larger in terms of magnitude and is statistically significant at the 8% level. The results are reliant on quite a small dataset, but nonetheless there is a degree of support for the conjecture that the debt–polarization relationship is stronger in the low government efficiency countries.

A final institutional qualification to the results relates to fiscal transparency. Alt and Lassen (2006) find that fiscal transparency plays a substantial direct role in curtailing debt accumulation and the electoral mechanisms underpinning debt accumulation that rely on imperfect information would potentially be changed given different degrees of transparency of fiscal policy. Again these data are not time varying, but in the same spirit as the above exercise we split the sample on the median and examine how the debt–polarization relationship changes with fiscal transparency. The data are taken from Fig. 1 of Alt and Lassen (2006), with countries split according to fiscal transparency scores of 4 or more, against score strictly less than 4. Fiscal transparency is quite distinct from government efficiency—the correlation coefficient between the two series is positive but quite small at 0.129, so the sample split is quite different from that for government efficiency.

The estimation results for the two subsample are presented in columns (6) and (7) of Table 5. Interestingly the estimation results for the more transparent subsample yield a stronger negative coefficient estimate for polarization. First note that on a formal statistical test the difference in the coefficient estimates for *POL* in columns (6) and (7) is not statistically significant, and also that the subsample for the less transparent countries in particular is quite small. Another important caveat here is

Table 4 Instrumental variable estimation results

	(1)
MEAN	0.368 (0.289)
POL	−1.727 *** (0.640)
LYP	−0.002 ** (0.001)
TRADE	−0.702 *** (0.191)
PROP1564	−1.275 (1.310)
PROP65	9.985 *** (1.227)
Obs	66
Data	10-year aves
No. countries	22
Method	IV
Overid	
(Sargan)	$\chi^2 = 2.666$ ($p = 0.103$)
(Basman)	$\chi^2 = 1.464$ ($p = 0.225$)
Weak inst	$F = 5.703$ ($p = 0.007$)
R^2	0.92

Instrumental variables regression of Central Government Debt on ideological polarization using media intensity measures and the Berlin Wall dummy variable (described in the text) as instruments. *, **, and ***, respectively, denote significance levels at 10%, 5% and 1%

that the transparency 'treatment' is problematic in that it is typically Anglo-Saxon countries that score highly on the Alt and Lassen (2006) measure. These countries are to a greater extent characterized by two-party competition where potentially voters are more responsive to economic policy platforms relative to voting under multiparty systems.

4 Conclusions

It is widely recognized that high levels of public debt arise out of imperfections in the political process. Undoubtedly, as established by Rogoff (1990) and Rogoff and Sibert (1988), a key weakness in any democratic system is imperfect information regarding politician quality. Competent incumbents are compelled into debt in order to signal their quality. This tendency is reduced when ideological polarization increases because voters are less responsive to changes in fiscal policy: hence, the hypothesis that polarization leads to lower debt levels. This prediction opposes the strategic debt argument of Alesina and Tabellini (1990) and Persson and Svensson

Table 5 Robustness and extensions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
MEAN	−0.308	0.070	0.150	−0.652	0.326	−0.280	−0.042
	(0.365)	(0.475)	(0.531)	(0.441)	(0.625)	(0.427)	(0.958)
POL	−1.240 **	−0.952*	−1.702	−0.741	−2.365 *	−1.946 ***	−0.970
	(0.489)	(0.508)	(1.172)	(0.633)	(1.190)	(0.503)	(1.460)
LYP	−0.001	−0.001	0.004	−0.000	−0.003 **	−0.000	−0.002
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)	(0.001)
TRADE	−0.170	−0.835	−0.080	0.749	−0.231	0.340	−0.228
	(0.300)	(0.526)	(0.568)	(0.479)	(0.505)	(0.540)	(0.394)
PROP1564	−1.499	−1.905	−1.063	−1.776*	−0.378	1.429	−3.557
	(1.864)	(3.971)	(2.867)	(0.939)	(3.036)	(2.237)	(2.572)
PROP65	9.551 ***	10.207*	3.409	-0.034	11.105*	3.530	8.740***
	(2.318)	(5.830)	(5.581)	(2.310)	(5.272)	(3.040)	(2.053)
NCP	8.036*	0.912	6.415	8.780	10.852	4.408	11.758*
	(4.392)	(6.650)	(5.672)	(5.046)	(6.043)	(5.885)	(5.010)
Obs	103	53	53	55	51	67	39
Data	10-year aves	10-year aves	10-year aves	10-year aves	10-year aves	10-year aves	10-year aves
No. countries	22	21	21	11	11	11	8
Method	OLS	OLS	OLS	OLS	OLS	OLS	OLS
R^2	0.78	0.95	0.89	0.79	0.85	0.73	0.85

As for Table 1. Column 1 excludes Greece, Portugal and Spain observations from the 1970s. Columns 2 and 3, respectively, correspond to higher- and lower-income levels ($LYP \gtrless 22801.64$.) Columns 4 and 5, respectively, correspond to higher and lower levels of average 'government efficiency' ($\overline{GOVEF} \gtrless 1.74$.) Columns 6 and 7, respectively, correspond to higher (≥ 4) and lower (< 4) levels of the Alt and Lassen fiscal transparency score. *, **, and ***, respectively, denote significance levels at 10%, 5% and 1%

Table 6 Average government efficiency ranking

Country	$\overline{GOVEF}$	Country	$\overline{GOVEF}$
Denmark	2.139	Belgium	1.727
Finland	2.137	UK	1.725
Sweden	1.990	USA	1.640
Switzerland	1.972	Germany	1.638
Norway	1.920	Ireland	1.569
Netherlands	1.894	France	1.561
Canada	1.868	Japan	1.329
Iceland	1.841	Spain	1.326
Austria	1.817	Portugal	1.072
New Zealand	1.775	Greece	0.651
Australia	1.749	Italy	0.561

$\overline{GOVEF}$ is average 'Government Efficiency' 1996–2012, using data measured and described in Kaufman et al. (2009). *, **, and ***, respectively, denote significance levels at 10%, 5% and 1%

(1989) where polarization is predicted to increase debt. Using ideology data taken from manifestos we find a robust negative empirical relationship between observed debt and polarization. This negative relationship is strengthened when fractionalized politics are controlled for and sustains in instrumental variable regressions. The negative debt–polarization relationship is estimated to be independent of income, though as conjectured it is found to be somewhat stronger when 'government efficiency' is lower.

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