

*Electoral systems and the politics of coalitions:
Why some democracies redistribute more than others*

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Abstract:

We provide an political-institutional explanation for the enormous variance in the extent to which democratic governments redistributes income from rich to poor. In addition to the number of veto points, which has been emphasized in the existing literature, we show the key role played by the electoral system. The electoral system is important because it shapes the composition of governing coalitions, whether these are conceived as party-forming alliances of classes or alliances between class parties. Our argument implies a) that center-left governments dominate under PR systems, while center-right governments dominate under majoritarian systems, and b) that PR systems redistribute more than majoritarian systems. We test our argument on panel data for poverty reduction and for government partisanship in advanced democracies.

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1. Introduction

Redistribution varies enormously from country to country. According to data from the Luxembourg Income Study, the reduction in the poverty rate in United States as a result of taxation and transfers was 13 percent in 1994 whereas the comparable figure for Sweden was 82 percent. Why do some democracies redistribute so much more than others? This is a key question for political economy and for democratic theory, and it is the question that motivates this paper.

Most work on the politics of redistribution starts from the premise that democratic institutions empower those who stand to benefit from redistribution. The basic logic is succinctly captured in the Meltzer-Richard model where the voter with the median income is also the decisive voter (Meltzer and Richard 1981). With a typical right-skewed distribution of income, where the mean exceeds the median income, the median voter will push for redistributive spending up to the point where the benefit of such spending to the median voter is exactly outweighed by the efficiency costs of distortionary taxation.

One of the key implications of this model is that inegalitarian societies will have more redistribution than egalitarian ones because the distance between the mean and median income is greater in those societies. But this proposition, rather surprisingly, has no empirical support. Indeed, the pattern appears to be the opposite: egalitarian societies redistribute *more* than inegalitarian ones (Bénabou 1996; Perotti 1996; Alesina, Glaeser, Sacerdote 2001). This clash of theory and evidence will be referred to in the following as the *equality-redistribution puzzle*.

One potential solution to this puzzle focuses on the role of partisan governments. There is strong empirical evidence that countries which are dominated by left governments also redistribute more (Hibbs 1977; Korpi 1983; 1989; Bradley 2002; Moller forthcoming), and it is also common to assume that left governments reduce wage inequality (Iversen and Wren 1998). If parties reflect class interests, this explanation jives well with the prediction in Lowi (1964) that redistribution tends to be dominated by class politics, and it could explain why there is a negative relationship between inequality and redistribution when partisanship is excluded from the analysis.

This solution, however, raises another puzzle: why are some countries dominated by left governments while others are dominated by right governments? We refer to this puzzle as the *partisan dominance puzzle*. Although government partisanship is often assumed to be a reflection of the overall level of working class mobilization, we argue that it is in fact mainly determined by differences in coalitional dynamics due to differences in electoral systems. We know from numerous studies that electoral formula is closely related to government spending (Rogowski and Kayser 2002; Milesi-Ferretti, Perotti and Rostagno 1999; Tabellini 2000; Persson and Tabellini 1999), and we will show that it is also closely related to redistribution. The reason, we argue, is that electoral systems affect coalition behavior and lead to systematic differences in the partisan composition of governments – hence to different distributive outcomes.

Our model assumes that parties represent classes, or coalition of classes, and that parties

maximize the preferences of their members (following Aldrich 1995). Furthermore, and key to our results, we assume that redistribution takes place in more than one dimension and that the number of parties varies with electoral system. With these assumptions, we show that in a two-party majoritarian system, the center-right party has an electoral advantage whenever there is a non-zero probability that the winning party will deviate from its electoral platform once in power. The reason is that left party leaders under majoritarianism have to compromise the ideal redistributive policies of their members more than right party leaders, and therefore face a greater incentive to adopt policies that are unattractive to the median voter.

In a multi-party PR system, by contrast, where each party represents a distinct class and must ally with another party to govern, the typical pattern is that the middle class (or center) party will ally with the lower class (or left) party. The reason in this case is that the middle class party can use taxes that fall disproportionately on the rich to bargain a level of social insurance with the lower class party, and hence taxation, that is closer to its ideal point. The result follows from having more than two class parties in a multi-dimensional space.

The implications of our coalition argument are that i) center-left governments will be more frequent under PR, ii) center-right governments will be more frequent under majoritarian rules, and iii) that redistribution will be greater under PR than under majoritarianism. Using data for both redistribution and for government partisanship we show that there is strong empirical support for these propositions, and that they solve both the equality-redistribution and partisan dominance puzzles. Specifically, redistribution is closely related to longterm patterns of government partisanship and partisanship is in turn explained by electoral system.

Since there is very little theoretical or empirical literature on the effects of electoral system on either redistribution or partisanship, we jump right to the argument and the evidence, comparing our model and results to existing work where appropriate. The strategy in the theoretical section is to show how electoral system affects coalitional politics, the partisanship of the government, and hence redistribution. In the empirical section we first show the effects of partisanship on redistribution (using data from the Luxembourg Income Study), and then the effects of electoral system on partisanship (using a broader data set for advanced democracies).

2. The argument

Similar to Persson and Tabellini (1999) we assume that there are three equally-sized income classes in the population, L (low), M (middle) and H (high). We deviate from Persson and Tabellini (and Meltzer-Richard), however, by allowing three minority parties under PR. The empirical literature shows that PR is closely associated with multiple parties and coalition governments (there are in fact no contemporary cases of majority parties, or single-party majority governments, under PR). Majoritarian systems, on the other hand, are typically dominated by two parties as we would expect from Duverger's law. Hence, we assume two parties under

majoritarian rules and three parties under PR rules.¹ In both cases, parties represent income classes in the population (they are “class parties”).

As in the Meltzer-Richard model, there is a proportional tax rate t , and each group gets the same universal transfer f , fully financed by the proportional tax. In addition, however, there is a second redistributive policy dimension, namely a transfer from the better-off to the poor. Specifically, L receives $(1-\varepsilon).g$ from H, with a small, but non-negligible, contribution $\varepsilon.g$ from M. What we have in mind is in effect a wealth tax, although one can more broadly think of it as an additional progressive tax to finance a means-tested benefit. As in Esping-Andersen’s (1990) classic study, universalistic or flat-rate benefits, which we have called f , are thus accompanied by varying levels of redistributive taxes and means-tested transfers, g .

Esping-Andersen also distinguishes earnings-related benefits, but if these benefits are directly proportional to income, they are equivalent for analytical purposes to people keeping their market income. Hence, there is no need to model them separately in a model of redistribution. If the benefits are not fully proportional, so that they result in some redistribution, the political logic will be captured by the universal benefit, f . Hence, we are assuming a benefit structure – a universalistic benefit supplemented by a means-tested benefit – that, following Esping-Andersen’s classic study, has been shown in study after study to be empirically salient.

We assume further that the wealth tax has a cost – which includes expenses for administration, rents to politicians who provide tax “loopholes” to the rich, the costs of paying lawyers to take advantage of these loopholes, etc. – where the cost of g to H is ag with $a > 1$. We also impose two constraints on the model: $0 \leq g \leq g^*$ and $0 \leq t \leq 1$. The upper limit g^* is assumed to be constitutionally guaranteed, and can be thought of as a basic property right protection that prohibits expropriation of property. For specificity we assume that this constitutional protection can only be overturned by three quarters of the legislature. In this case H (assuming it has 1/3rd of the seats in the legislature) can always block any attempt to raise g^* , and H voters will have an incentive vote under PR even when they can predict an LM coalition. In general, one can think of g^* as measuring the power of veto players in the system.

In Appendix A we present a model where preferences over taxation are endogenously determined by the income of each group. Here we use a simplified version of that model, which contains the key insight and yields the same substantive answers to the question we are interested in: under

¹ This is the main way in which our model deviates from that presented in Persson and Tabellini (1999), which does not explain redistribution. The two-party assumption in Persson and Tabellini plainly does not make sense for PR systems, as the authors are clearly aware: “We hold the party structure fixed, ignoring theoretical arguments as well as empirical evidence for a larger number of parties under proportional elections” (p. 706). They go on to say that “our excuse is pragmatic; we simply do not know how to analyze multi-dimensional policy consequences of electoral competition in a multi-party setting.”

what circumstances will a switch from plurality voting with two parties to PR with three parties imply increased redistribution to L?

In the simple model, L is interested in maximizing g and getting t set as close as possible to 1; H in minimizing both g and t ; and M in setting t as close as possible to some intermediate level of t , here 0.5, and in minimizing g . In other words, the goals of the three groups are as follows:

$$u_L = g - |1 - t|$$

$$u_M = -|t - 0.5| - g \cdot (1 + a) \cdot e$$

$$u_H = -|t| - g \cdot (1 + a) \cdot (1 - e)$$

Majoritarian elections. There are two parties, CL and CR, which organize voters on either side of the median income. One party thus “represents” the center-left and the other the center-right, and will have different ideal policies as a result. If these are characterized by the preferences of the median constituent in each party, and given that the middle income group is a minority in both parties, the center-left party will want $\{g, t\} = \{g^*, 1\}$ while the center-right party will want $\{g, t\} = \{0, 0\}$. However, in a majoritarian system no party can affect policy without winning a majority of the vote, so the platform presented in the election will clearly need to deviate from the policy preferences of the median constituent in each party.

What is the vote-maximizing platform? It turns out that this is given by a simple median voter result. Since there are two policy dimensions, it is not obvious why this should be so. However, it follows from a simple application of the *intermediate preferences* theorem (see Grandmont 1978 and Persson and Tabellini 2000). To see this, assume that CL adopts the median voter platform. Because the median voter belongs to the middle income group, this platform is $\{g, t\} = \{0, 0.5\}$. The question is now whether CR can set a platform which will attract more electoral support. Specifically, CR might set a platform with $t < 0.5$ thus attracting H-voters and $g > 0$, thus attracting L-voters. This is not feasible, however, because, in effect, the interests of L and H are too misaligned. Suppose for example that $t = 0.4$, so that H gains, and L loses, 0.1. To compensate L, CR thus has to provide a $g \geq 0.1$. But this costs H more than 0.1 because $a > 0$, so it would prefer the CL platform. Hence, the median voter platform cannot be broken. This holds for any policy platform that CR might propose where $t < 0.5$ (any platform with $t > 0.5$ will only gain the support of L voters).

Before proceeding, it is useful to briefly characterize the median voter platform in left-right terms. Compared to the ideal policies of L and H, the median voter platform is closer to the preferences of H than to the preferences of L, and in that sense the median voter platform may be thought of as right-of-center in substantive terms. The reason is that although the middle class deviates from both the lower and upper class in terms of preferences over the level of taxation and spending, it share an interest with the latter in restricting redistributive transfers to the poor. This is an old

insight in the welfare state literature, emphasized by Esping-Andersen in his discussion of means-tested benefits (1990, ch. 1). It arises in our model because of the two-dimensional nature of social spending.

Given that the two parties in a majoritarian system represent different constituencies, is it realistic that they will converge on the median voter platform? This is a well-known problematic in the party literature, and most answers suggest that while there is significant pressure on parties to present moderate platforms in general elections, it is hard for party leaders to completely ignore the policy preferences of their constituents. One argument is that leaders need to mobilize their base in order to maximize voter turnout among their prospective supporters. This involves appeals to the policy preferences of the median activist and emphasis on policy differences with the other party (Aldrich 1993, 1995, ch. 6; Schlesinger 1984).

An alternative formulation with similar results is that parties cannot make binding commitments to electoral platforms (Downs 1957; Persson and Tabellini 1999). Once in office there is an incentive for both parties to adopt policies that reflect the preferences of the median constituent. This incentive is tempered by the concern for cultivating a reputation for reliability, but reputation is an imperfect commitment mechanism in an uncertain world with short-sighted politicians. As a result, the median voter has reason to worry that whoever wins the election may give in to the temptation to pursue policies which appeal to the party's internal majority: thus the temptation for the center-right party, if it wins, is to put the policies $\{0, 0\}$ into operation; and for the center-left party to carry out the policies $\{1, g^*\}$. This affects the voting behavior of the median voter in a way that is subtle, but import to our story.

To understand this, assume that whether or not a party yields to the temptation if elected depends on whether the costs outweigh the temptation benefits, T_{CL} and T_{CR} . These variables are straightforwardly calculated; $T_{CL} = g^* + 0.5$, $T_{CR} = 0.5$, in each case the gain from switching from the median voter's ideal point $(0.5, 0)$ to $(1, g^*)$ and $(0, 0)$ respectively. The cost of adopting more extreme policies is the loss of reputation. The loss of reputation for trustworthiness matters to a government: without such a reputation governing is less effective since it is harder for the government to make deals with other agents. We model this by assuming that the loss of effectiveness is a cost, c_{CL} and c_{CR} , respectively, which restricts government effectiveness if a defection to more extreme policies takes place. Thus the payoff to the left party from defecting is $T_{CL} - c_{CL} = g^* + 0.5 - c_{CL}$ and the payoff to the right party is

$$T_{CR} - c_{CR} = 0.5 - c_{CR}.$$

Next we assume that c_{CL} and c_{CR} are random variables independently drawn at each election from the same uniform distribution, normalized for convenience to $[0, 1]$, with $1 > \max[T_{CL}, T_{CR}]$.

Thus in the election campaign the median voter forms an idea of how trustworthy each of the party leaders are after they have set out their platforms; since this trustworthiness can be valuably used by the executive if it carried out the median voter policies, the loss of this attribute would be

the cost of yielding to the temptation of switching to left or right policies once in power.

The median voter would be indifferent which party he or she voted for if $T_{CL} < c_{CL}$ and $T_{CR} < c_{CR}$. But if $T_{CL} > c_{CL}$ and $T_{CR} < c_{CR}$ or if $T_{CL} > c_{CL}$ and $T_{CR} > c_{CR}$ the median voter would vote center-right; and if $T_{CL} < c_{CL}$ and center-left if $T_{CR} > c_{CR}$. Using the joint cumulative distribution function of c_{CL} and c_{CR} , it is not difficult to see that the center-right would win a proportion

$$p_{CR} = T_L \cdot (1 - T_R) + T_L \cdot T_R + \frac{(1 - T_L) \cdot (1 - T_R)}{2}$$

of elections against

$$p_{CL} = T_R \cdot (1 - T_L) + \frac{(1 - T_L) \cdot (1 - T_R)}{2}$$

won by the center-left. It follows that

$$p_{CR} - p_{CL} = T_L - T_R + T_L T_R > 0.$$

In other words, the center-right party wins more of the time. The intuition behind this result is simple and goes back to our observation that the median voter share an interest with the well-off to avoid means-tested transfers to the poor. While both parties may fall to the temptation to adopt tax policies that are unattractive to the median voter, it is only the center-left party that has an incentive to adopt policies of means-tested transfers to the poor. This makes the median voter more likely to vote for the center-right party.

Whether a center-right party would also win against a center party depends on the exact interpretation of what a center party is. If it is a center-left party representing middle class voters only, then it would be more attractive to the median voter than the center-right party. But if the party is a center party in the sense that it adopts a platform between the preferred platform of the center-left and center-right parties, then the prediction is ambiguous since the party would be closer to the median voter on t but farther away on g compared to a center-right party. Finally, if by the center is meant a center-left party with a platform mirroring the preferences of the median voter, then the prediction is that the center-right party has an electoral advantage. This ambiguity is not an issue in terms of the model – it always yields precise predictions. It is however an issue for the empirical analysis of partisanship, which is based on expert classifications of parties on a left-right scale. Since the designation of a party as centrist is likely to mix the above interpretations of what a center party is, we cannot have any clear predictions about the performance of center parties in majoritarian systems. The predictions for center-left and center-right parties, however, are unambiguous: the latter win more of the time.

Proportional representation. For simplicity we assume here that there are three representative parties under PR – L, M and H – none of which have an absolute majority in the electorate. It is furthermore assumed to be common knowledge that each party seeks to promote the welfare of

the class it represents. A party therefore cannot credibly stand for a platform different from the optimal policies of its class. This is similar to the model presented in Persson and Tabellini, and it conforms to standard notions of class parties. Based on these assumptions, we will show that under most conditions there exist a unique policy equilibrium that favors redistribution.

That this should be the case is, as noted above, not intuitively obvious: Coalitions between M and H are on the face of it as likely as coalitions between L and M. When t is the only policy dimension, and if a “split the difference” rule determines the policy a coalition will follow, M will be, *ceteris paribus*, be indifferent between a coalition with H and a tax rate of 0.25 and a coalition with L and a tax rate of 0.75. Both imply utility of $-.25$ to M.

But this conclusion no longer holds when g is added. The reason is that M can now offer concessions to L on g at low cost in exchange for a tax rate that is closer to its preferred tax rate. M has no such bargaining leverage over H and the outcome will be the same as before. The result will be a center-left coalition.

To see this is in fact so, we first introduce a procedural rule for coalition formation. There is an advantage in clarity to assume that M is always charged with coalition formation, and is the first to make an offer if a coalition is formed. In principle this gives M a first mover advantage, but when the time lapse between offers approximates zero, so does the advantage, and it then makes no difference to the results what party is the formateur.

The government formation game now proceeds as follows:

- (i) M can offer to form a coalition with either L or H.
- (ii) If M chooses to make the offer to H, H can either accept or reject the offer.
- (iii) If H rejects the offer, M must make the offer to L. L can either accept or reject the offer. If L rejects the offer, M must make the offer to H, etc.
- (iiib) If H accepts the offer, H and M enter into coalition bargaining.

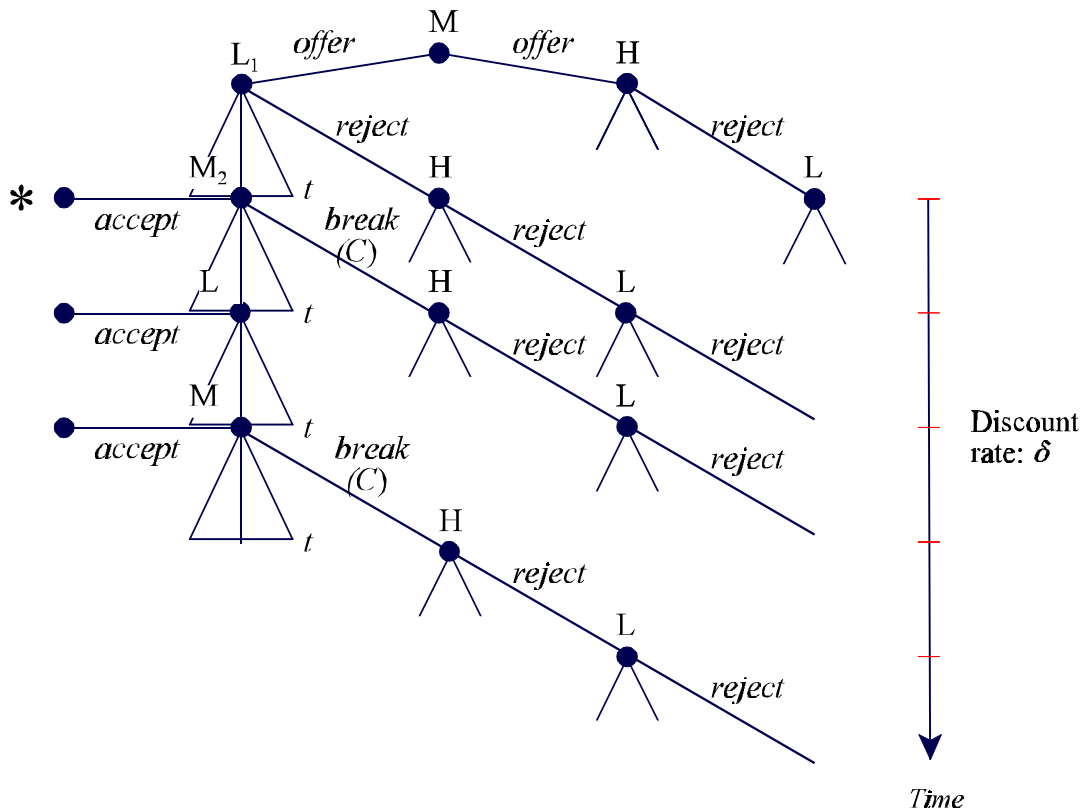
The coalition bargaining game is an alternating offers game over t and g , with M making the first offer. Each party has the same discount rate of δ . If an offer is made which the other side accepts, the coalition is set up and the policy implemented. M can break the bargaining after an offer from H and offer to form a coalition with L. L can accept or reject the offer. If L accepts the offer, we continue as in (iiib) but with L substituted for H. If L rejects the offer we continue with (iii) but with L substituted for H.

We assume, realistically we believe, that if M enters into and then breaks a coalition, M incurs a cost of $C > 0$. Coalition breakups are accompanied by discord and puts on public display the inability of the coalition parties to govern. We will see in a moment that *any* cost of coalition will prevent H from underbidding a coalition of L and M that is based on a Rubinstein solution.

The game is shown in extensive form in the following diagram (Figure 1). At the beginning of the

game, M can choose between making an offer to H or L. Whichever party gets the offer can choose either to accept it or reject it. If the offer is accepted, an alternating offers bargaining game begins. This is shown for L, starting from L_1 . L, the accepting party, chooses a value of t (shown by a line from the apex to the base of the L_1 triangle - the base represents t going from 0 to 1). M can either accept the offer, in which case the game ends and the coalition is set up; or make a counter-offer by choosing a line in the triangle starting at M_2 ; or break up the coalition negotiations, in which case M incurs a cost of C and offers a coalition to H. H can either accept the offer in which case a new bargaining game starts, or reject it in which case M must offer a coalition to L, etc. Each time an offer is rejected time passes, which reduces the current value of any subsequent agreement by a factor of δ .

Figure 1. Structure of the game.



This game is simple to solve. Assuming M could not break from the coalition negotiations, the sub-game perfect result of the negotiations using a Rubinstein bargaining solution converges to a split the difference solution as the interval between offers in the alternating offers bargaining sub-game goes to zero.

Always assuming M could not break from the coalition negotiations, in the case of an HM coalition the value of t which splits the difference between $u_M = -|t - 0.5|$ and $u_H = -|t|$ is $t = 0.25$; this gives M a utility level of -0.25 . In the case of an LM coalition, it is possible for M to cede $g = g^* = .25$ to L at a low cost (since most of the cost falls on H). Specifically, if the cost of b is small to M ($\epsilon \rightarrow 0$), it can be shown (as is done in Appendix B) that the split the difference requires $t = 0.75 - g^*/2$ giving M a utility that is greater than -0.25 .

Let us therefore examine the strategy combination: M offers a coalition to L at the start. Whenever L is offered a coalition, L accepts and makes a first t offer of $0.75 - g^*/2$ to M. M always accepts. If H is offered a coalition, H accepts and offers $t = 0.25$. This is rejected by M. On the equilibrium path, M therefore immediately receives an offer of $0.75 - g^*/2$ that is accepted (indicated in the diagram by a *).

One objection to this result is that since the outcome of the game is not very attractive to H, why cannot H offer M a coalition in which, say, $t = 0.45$? M and H are both better off with such a coalition. Indeed, to continue this line of argument, it would always pay whichever party is excluded from a coalition to bid away M from the coalition so long as $t \neq 0.5$. Hence one should not expect the outcome to differ from the median voter preference.

This argument, however, depends on their being a *zero* cost of breaking a coalition agreement or ending a coalition bargaining process. If there is a positive cost C , then such counter-offers are not credible; and much evidence can be adduced that breaking coalitions or coalition bargaining is a damaging process for a party.

The simplest way to understand this is to think about what would happen once an M-H coalition has formed as a result of a more attractive offer from H. Once this has happened, H can always exploit its bargaining power to the point where H gets everything it can *short* of causing a coalition to breakup. If M is therefore offered a deal from H that is marginally better than the deal it can get from L, M knows that once the government has formed it will end up with less than it could get from L. As long as the breakup cost is nonzero, H can never offer a credible deal to M that is better than the deal offered by L. In effect, H faces a time-inconsistency problem (not unlike the credible commitment problem in the majoritarian case, but with the opposite effect).

This formulation suggests that the cost of a coalition breakup constrains the Rubinstein solution. But there is another, more fundamental, argument that retains this solution entirely. Suppose there was a sub-game perfect equilibrium counter-offer by H of t^* , where t^* did not reflect H's full bargaining power in the absence of a counter-offer from L; M must be indifferent in equilibrium between t^* now and L's sub-game perfect counter-offer of say t^{**} one period hence, i.e. M must be indifferent between t^* and $t^{**} - C$. But the same is true for L's counter-offer: t^{**} must leave M indifferent between that and H's counter-offer one period hence. Because the game is stationary H is in exactly the same position whenever H makes a counter-offer. So H's counter-offer is again t^* , and M must be indifferent between t^{**} and $t^* - C$. But now there is a contradiction: M cannot

both be indifferent between t^* and $t^{**} - C$ and between t^{**} and $t^* - C$.² Hence if $C > 0$, however small, the only credible platform which can be negotiated with the excluded party is where the excluded party is using full negotiating power - here leading to split the difference.

Whatever the exact formulation of the difficulty H encounters when attempting to break up a coalition between L and M, our analysis has yielded an unambiguous and stark insight that we do not believe has been articulated in any of the existing literature. Majoritarian electoral systems tend to produce center-right governments whereas proportional electoral systems tend to produce center-left governments. The former will redistribute less than the latter. The key to understanding redistribution is the long-time political dominance of the left or right, and a key to understanding long-term partisan dominance is the electoral rule.

3. The evidence

We test our argument in two parts. In the first part we use partisanship and electoral system as explanatory variables for differences in the level of redistribution. In the second part we use partisanship as a dependent variable, testing the proposition that electoral system affects coalition behavior and therefore the composition of governments. To our knowledge, the effects of electoral system on redistribution or government partisanship have never been subject to empirical analysis.

3.1. Data

Most existing work on redistribution rely on indirect measures such as government transfers, social spending, or some other indicator of welfare state effort. Such measures are not entirely satisfactory because the data come in a form that typically tell us very little about the extent of redistribution as opposed to the level of spending.

Relying on spending data to measure redistribution is no longer necessary. During the past three decades the Luxembourg Income Study (LIS) has been compiling a significant amount of micro-data on pre and post tax and transfer income inequality. The LIS data used for this study cover 14 countries over a period that runs from the late 1960s (the first observation is 1967) to the late 1990s (the last observation is 1997). There are a total of 61 observations, with the number of observations for each country ranging from 2 to 7. About one fifth of the observations are from the 1970s and late 1960s, about 40 percent from the 1980s, and the remainder from the 1990s. The data are collected from separate national surveys, but considerable effort has gone into harmonizing the data (or “Lissifying” them, as LIS call it) to ensure they are comparable across

² Since $u_M = -|0.5 - t|$, the first indifference states that $-|t^{**} - 0.5| = -|t^* - 0.5| - C$ while the second states that $-|t^* - 0.5| = -|t^{**} - 0.5| - C$ implying $-|t^{**} - 0.5| = -|t^{**} - 0.5| - 2C$.

countries and time. The LIS data are widely considered to be of high quality and the best available for the purposes of studying distribution and redistribution (see OECD 1995).

We use the data specifically to explore the determinants of redistribution as measured by the percentage reduction in the gini coefficient from before to after taxes and transfers. The gini coefficient is a summary measure of inequality that falls as income is shifted from those with high to those with lower incomes to approximate more closely an even distribution of income. Using an adjusted version of the LIS data – constructed by Huber, Stephens and their associates (Moller et. al. 2002)³ – we include only working age families, primarily because generous public pension systems (especially in Scandinavia) discourage private savings and therefore exaggerate the degree of redistribution among older people. Furthermore, because data are only available at the household level, income is adjusted for household size using a standard square root divisor (see OECD 1995).

On the independent side, the two key variables are electoral system and government partisanship. Electoral system is measured by three commonly used indicators, all explained in Lijphart (1994). The first is Laasko and Taagepera's (1979) measure of the effective number of parties in the legislature, which is defined as one divided by the sum of the square root of the shares of seats held by different parties (or one divided by the Hilferding index). The second indicator measures the effective threshold of representation, or the minimum level of support which a party needs in order to gain representation. The measure was developed by Lijphart based on national election laws and district magnitudes (see Lijphart 1994, 25-30). The final indicator is Gallagher's measure of disproportionality between votes and seats, which is an indication of the extent to which parties are being represented at their full strength. All indicators were standardized to have a mean of 0 and a standard deviation of 1 before averaged into an index that varies from high proportionality with many parties to pure majoritarianism with two parties. There is only modest change in the three variables over time, and we follow Lijphart's periodization of changes.

Government partisanship is an index of the partisan left-right "center of gravity" developed by Cusack (1997; 1999). It is based on (i) Castles and Mair's (1984) expert-based coding of government parties' placement on a left-right scale, weighted by (ii) their decimal share of cabinet portfolios. The index varies from 1 (extreme right) to 5 (extreme left), with 3 being the center. All observations for government partisanship range are between 2 and 4. As discussed in more detail below, we use the left center of gravity measure as a dependent variable in the second part of our analysis, with a significantly expanded country and time coverage.

In addition, we included a set of measures designed to capture the variables discussed in the theoretical sections, as well as some additional controls for economic conditions. These variables, with definitions, sources, as well as a short discussion of the causal logic, are listed below. Country means and variable correlation matrix are provided in Appendix C.

³ We are grateful to the authors for letting us use their data.

Pre tax and transfer inequality. This variable is included to capture the Meltzer-Richard logic that more inequality will lead to more pressure for redistribution. It is measured as the earnings of a worker in the 90th percentile of the earnings distribution as a share of the earnings of the worker with a median income. The data is from OECD's wage dispersion data set (unpublished electronic data).

Constitutional veto points. This is Huber, Ragin, and Stephen's (1993) composite measure of federalism, presidentialism, bicameralism, and the frequency of referenda. The more independent decision nodes, the more veto points. One can raise definitional objections to the inclusion of referenda as a veto point, but it is clearly the case that referenda are typically used to block legislation that would otherwise have passed by a majority (see Lijphart 1999, 230-1).

Unemployment. Since unemployed receives no wage income, they are typically poor without transfers. Since all countries have public unemployment insurance, higher unemployment will "automatically" be linked to more redistribution. The unemployment figures are standardized rates from OECD, *Labour Force Statistics* (Paris: OECD, various years).

Real per capita income. This is a standard control to capture "Wagner's Law", which says that demand for insurance will increase with income. The data are expressed in constant 1985 dollars and are from the World Bank's Global Development Network Growth Database (<http://www.worldbank.org/research/growth/GDNdata.htm>) -- itself based on Penn World Table 5.6, Global Development Finance and World Development Indicators.

Female labor force participation. Women's participation in the job market varies considerably across countries and time, and it is likely that such participation matters for redistribution because it entitles some women to benefits (unemployment insurance, health insurance, etc) that they would otherwise not get. Whether this leads to more redistribution depends on the position of working women in the income distribution, as well as their family status, but there is a common presumption that women are more likely to be in low paid jobs and from low-income (single-parent) households. The measure is female labor force participation as a percentage of the working age population and is taken from OECD, *Labour Force Statistics*, Paris: OECD, various years.

Size of old population. Although the redistribution data only considers working age families, those who are retired often depend heavily on transfers and may support policies that are more broadly redistributive.

3.2. Statistical model

In analyzing pooled cross-sectional time-series data, a very popular method among political scientists is OLS regression with a lagged dependent variable (to eliminate serial correlation) and panel corrected standard errors (to adjust for heteroscedasticity and contemporaneous correlation

of errors) (see Beck and Katz 1995). We use this method for the second stage estimation. For our first stage test, however, this approach is not feasible because the observations for each country are unequally spaced, varying between 2 and as many as 10 years. Still, it is convenient to describe the method actually used, which follows the lead of Moller et al. (2002), relative to the better known lagged dependent variable approach with panel corrected standard errors.

The used method employs OLS regression with a robust-cluster estimator of the standard errors. The robust estimator (which is a variant of the Huber-White or “sandwich” estimator) corrects for heteroscedasticity and any serial correlation within the errors (in fact, any pattern of correlation among the errors for each country) (see Rogers 1993). Unlike pcse’s, however, this method cannot deal with contemporaneous correlation, and we cannot exclude the possibility that redistribution in different countries are affected by common economic or political shocks. To deal with this problem we therefore included time dummies for all years where more than one survey was conducted (specifically: 1974, 1975, 1979, 1981, 1983, 1984, 1985, 1986, 1987, 1989, 1992, 1994, and 1995). In so far as there are common influences across cases on redistribution during these years, they will be eliminated by the dummies. An F-test shows that the dummies belong in the model.

With these adjustments, we should get consistent estimators with standard errors that are in principle be very similar to pcse’s. With this in mind the model to be estimated is simply:

$$R_{i,t} = a + \sum b^j \cdot y_{i,t}^j + \sum c_y \cdot d_y + e_{i,t} ,$$

where $R_{i,t}$ is the percentage reduction in the poverty rate for country i at time t , b^j is the estimated regression coefficient for variable j , and d_y is the dummy variable for year y . The results reported below excludes the estimated parameters for the year dummies.

The model for partisanship (P) used in the second stage includes a lagged dependent variable, and instead of the robust-cluster estimator of the standard errors, we use panel corrected standard errors as is now standard:

$$P_{i,t} = a + r \cdot P_{i,t-1} + \sum b^j \cdot y_{i,t}^j + \sum c_y \cdot d_y + e_{i,t}.$$

3.3. Findings

3.3.1. Redistribution. We begin our presentation with the results from estimating a simple baseline model with economic variables (column 1 in Table 1). As expected, female labor force participation and unemployment are associated with more redistribution. Higher per capita income

also marginally reduces redistribution, whereas the size of the old-age population does not matter. None of these effects are large and they do not hold up consistently across model specifications.

As in other studies, we also find that inequality of pre tax and transfer income has a *negative* effect on redistribution, contrary to the theoretical expectation of the Meltzer-Richard model. This negative effect is statistically significant at a .02 level, although the substantive impact is fairly modest: a one standard deviation increase in inequality is associated with a .11 standard deviation reduction in redistribution.

[Table 1 about here]

Model 2 introduces government partisanship, veto points, and the electoral system variable into the model. Partisanship is here defined as a contemporaneous variable, and thus captures only the immediate effects of the left-right composition of governments. As expected, more left-leaning governments are associated with more redistribution, but the effect is statistically insignificant. By contrast, both veto points and electoral system are strongly negatively related to redistribution.

The weak effect of partisanship contrasts to the strong partisan effects found in Moller et al. 2002 (see also Bradley et al. 2002). The reason is that they use an average of government partisanship for the postwar period instead of a contemporaneous measure. Their justification is that the effects of partisanship accumulate over time. Indeed, it appears implausible that redistribution in any given year is simply a function of partisanship in that year. Since we only have a few unevenly spaced observations for each country there is no easy way to detect exactly how partisan effects are cumulated over time, so we used a cumulative measure for partisanship in column 3 that is similar to the Huber-Stephens measure. The consequences for the results are notable.

First, the partisan effect is much stronger, and now statistically significant at a .01 level. Specially, a one standard deviation change of the government in a left direction is associated with a .31 standard deviation increase in redistribution. Second, the effect of electoral system disappears. This is also as to be expected from the model since the effect of electoral system should go through government partisanship. In the regression using the contemporaneous measure of partisanship (column 2), some of the long-term partisan effects will be picked up by the electoral system variable. This effect is eliminated by using a cumulative measure of partisanship. Third, in model 3 the Meltzer-Richard effect now comes through clearly, so that higher inequality is associated with *more* redistribution. Although it needs to be confirmed through additional empirical analysis, an obvious interpretation of this switch in sign is that left governments not only increase redistribution but also reduce inequality. For example, partisan differences in educational policies are likely to have an effect on before tax and transfer inequality. If so, this explains the equality-redistribution puzzle.

Model 4 simply repeats model 3 using the Huber-Stephens measure of left partisanship instead of the Cusack measure. The Huber-Stephens measure is the average percentage share of government seats held by left parties. We again find a strong effect. In fact, the effect is somewhat stronger,

with a one standard deviation increase in left seat shares being associated with a .43 standard deviation increase in redistribution. Not surprisingly, the two partisan measures are highly correlated ($r=.82$).

The last column shows what happens when government partisanship is excluded from the regression. The main effect is to increase the impact of electoral system. This effect is further increased (to -2.82) if we include a dummy variable for Switzerland. Although there are only two Swiss observations, these are big negative outliers. Thus, the explained variance goes up by four percent when they are excluded from the regression. The effect of the Swiss case on the results is even clearer when we use the effective number of parties as the predictor (not shown). Without the Swiss dummy the coefficient on the number of parties variable is .89 and $p<.45$. With the dummy it is 2.6 with $p<.001$.

So does the Swiss outlier indicate a flaw in our argument? We think not. In fact, we would argue the opposite: Switzerland highlights the causal logic we have in mind. Coalitional dynamics in Switzerland are completely different than in other PR countries because executive power since 1959 has been shared between the four main parties (which control 80 percent of the vote). Although there is no constitutional provision for such power sharing, according to Lijphart it is in effect an unbendable institutional rule (Lijphart 1999, 34-42). This completely alters the coalition logic compared to other PR systems: If governments cannot be formed without participation of center-right parties, the interests of these parties cannot be ignored either. What this suggests, in our view, is the importance for redistribution of *excluding* the right from government power. Contrary to the notion in Lijphart and Crepaz, power sharing is *not* the source of redistribution.

3.3.2. *Partisanship*. The second key implication of our argument is that center-left governments tend to dominate over long periods of time under PR, whereas center-right governments tend to dominate under majoritarianism. Partisanship is the mechanism through which electoral system has an effect on redistribution. To test this implication we employed Cusack's (left) center of gravity (CoG) index, which is available from 1950 to 1996 for 17 countries that have been democracies since the Second World War.

As noted, one of these -- Switzerland -- has a collective executive that prevents coalition politics from having any influence on the composition of the government.⁴ For the remaining 16, if the electoral system index is used to divide one half into a "proportional" category and one half into a "majoritarian" category, it is evident from Table 2 that the average balance of power in government is significantly more to the left in proportional than in majoritarian systems. A simple analysis of variance (shown at the bottom of the table) reveals that the difference between the two groups accounts for 79 percent of the cross-national variance in left-right cabinet composition over time.

[Table 2 about here]

⁴ All the reported results in this section go through with Switzerland included.

Note that Germany is classified in the majoritarian group, whereas it is usually counted as a PR system (therefore the parentheses). In a purely mechanical sense, the high German score reflects a relatively high threshold of representation and a small effective number of parties. Numbers aside, it is not uncommon to treat Germany's system of representation as restrictive. Kitschelt (1986), for example, classifies Germany as a "closed" political system comparable to France, with a weak legislature and a few centrist parties.

For our purposes it is notable that for most of the postwar period the German legislature has been dominated by only three parties, and that two of these (SPD and CDU/CSU) are much larger than the third (FDP) – the latter being on the right in terms of economic policies. If bargaining power is dependent on size, this constellation produces an interesting twist on our story since the low bargaining power of FDP may enable it credible to offer concessions to CDU/CSU that are superior to those that SPD can credibly offer. Essentially, the small size enables FDP to overcome the time inconsistency problem and provide both major parties with an incentive to forgo a coalition with each other. Paradoxically, the result is that the German economic right, despite being small, has more influence over policies than in most "PR" systems.⁵

One way of conveying the comparative evidence is to examine the ideological complexion of governments on an axis. To do this, we excluded all years with "pure" center governments (a score of 3 on Cusack's scale) since these do not speak to the issue of partisan coalitions under PR and cannot be seen as either confirmation or disconfirmation of the argument under majoritarian rules.⁶ We also excluded all observations from PR systems with a majority of parliamentary seats to the left of the center (there are no instances of a majority of seats to the right of center). The reason is that the existence of left governments in these instances cannot be taken as independent

⁵ If Germany is counted instead as a PR system, the variance accounted for by electoral system falls to 68 percent.

⁶ The model prediction for the center depends on the exact interpretation of what a center party is. If it is a center party representing middle class voters only, then it would be more attractive to the median voter than the center-right party. But if the party is a center party in the sense that it adopts a platform between the preferred platform of the center-left and center-right parties, then the prediction is ambiguous since the party would be closer to the median voter on t but farther away on g compared to a center-right party. Finally, if by the center is meant a center-left party with a platform mirroring the preferences of the median voter, then the prediction is that the center-right party has an electoral advantage. This ambiguity is not an issue in terms of the model – it always yields a precise prediction. It is however an issue for the empirical analysis since the expert designation of a party as centrist is likely to mix the above interpretations of what a center party is.

support for the notion that coalitions are more likely to form to the left.⁷

Table 3 is a simple cross-tabulation of electoral system and government partisanship, using the remaining 596 observations. The relationship between the two variables is strong: Among PR systems, 72 percent of governments are center-left, whereas among right governments 85 percent are center-right. To convey a sense of the evidence at the level of countries, the numbers in parentheses classify countries according to whether they has an overweight (more than 50 percent) of center-left or center-right governments.

[Table 3 about here]

There is only one country, the Netherlands, that does not conform to the predicted pattern. In the Dutch case we would have expected more left than right governments, but in fact there was a slight overweight of center-right governments (24 versus 20). As in the case of Germany, the explanation seems to be relative bargaining power. The dominant Christian democratic center party (CDA), which has consistently polled a third or more of the votes, faces a large social democratic party (PvdA) to its left (getting between a quarter and one third of the vote), but several smaller parties at the center and to its right. In particular, as long as the liberal party was relatively small, the CDA formed governments with this party most of the time. As the Liberals grew stronger during the 1980s, CDA shifted towards the small center party D'66 and the social democrats. The CDA thus seems to forgo alliances to the left as long as right coalition partners are not too large.

Be that as it may, it should be noted that the slight overweight of center-right governments in the Netherlands does not mean that the predictions of the model are irrelevant for this case. The effect of PR on redistribution does not require a surplus of center-left governments, only that the frequency of center-right governments under PR is lower than under majoritarianism. And that is certainly the case in our data. The country that comes closest to the 53 percent figure for the Netherlands is Australia, where 66 percent of governments were right of center.

It can be objected to the previous analysis that we have not taken into account that the left-right balance of governments is also affected by the left-right balance of power in the legislature. Although we *did* exclude cases where a majority can be formed on either side of the center, center parties may be more likely to ally with left (right) parties when more seats are concentrated on the left (right). For example, if there is only a slim majority to the right, center parties forming a

⁷ Note, however, that in the 40 cases where there was not a single party majority, 36 were social democratic minority governments (all from Norway and Sweden), which relied heavily on support from left parties in parliament rather than from center parties. In one case, Denmark in 1967, the government was a coalition between the social democrats and the socialist people's party to its left. Although the center did not hold a pivotal position in any of these cases, it is consistent with our argument that social democrats tended to form coalitions with parties to their left rather than to their right.

government to the right would have to rely on more extreme parties than if it formed a government to the left. Likewise, rules of government formation may yield an advantage to larger parties, and whether the largest parties are found on the left or right is obviously correlated with the left-right distribution of votes.

To address this concern we calculated the *difference* between the left center of gravity score for national governments and legislatures. Using annual observations as before, this allows us to calculate the number of governments that are to the left or right of the center of gravity score in their respective national legislatures. Again, we exclude “pure” center governments, and we also eliminated a few cases with single party majorities under PR (since it does not make sense to apply coalition arguments to these cases).

As it turns out, the results do not change much, although they *are* slightly weaker (see Table 4). 65 percent of PR governments are now to the left of center, whereas 77 percent of governments in majoritarian systems are to the right of center. As before, the Netherlands breaks the pattern with a slight overweight of center-right governments (25 compared to 20). However, it is now joined by another country: Italy. Although this is almost a pure case of PR, we find no less than 22 out of 28 years with governments to the right of the legislative center (the rest were pure center governments). The Italian observations thus seem to run against our argument.

[Table 4 about here]

But the numbers mislead. In every one of the 22 observations with coalition governments to the right of the legislative center of gravity, the ideological complexion of the government was in fact to the *left* of the large and pivotal center party, the Christian Democrats. In other words, in *every* instance where the Christian Democrats (DC) needed to find allies outside the center, they turned to small parties slightly to the left of center (PSI and PSDI). The reason that Italian governments were nevertheless often to the right of the legislative left-right CoG is that the communist party commanded a substantial share of seats, yet was never part of a government. Their support was simply not required to govern.

This pattern is clearly consistent with our argument and if we reclassified the 22 Italian observations agreeing with the theory – i.e., the cases where DC produced governments that were to the left of its own position – the share of center-left governments under PR rise from 65 to 75 percent – the same share as when we use the center of the ideological scale as the dividing line (refer back to Table 3).

We can confirm the bivariate pattern using multivariate regression (see Table 5). The first column shows the effect of the electoral system variable on the left center of gravity score, controlling for a lagged dependent variable and year dummies (as before, the analysis excludes pure center governments). As expected, majoritarian systems are significantly associated with right of center governments. This relationship holds when we use a dichotomized version of the electoral system variable (column 2). Indeed, this variable performs better than the original variable because the

effect of electoral system is discontinuous rather than linear.

In substantive terms, the results indicate that going from a PR system to a majoritarian system reduces the predicted left center of gravity of the government by .24 after one period and by 1.1 in the long run. A difference of 1 on the CoG measure is equivalent to the difference between a social democratic and a typical Christian democratic party, or between the latter and a liberal party. This is equivalent to 1.5 standard deviations on the dependent variable – a large effect by any standard.

In column 3 we use the *difference* between the government and the legislative center of gravity (higher values indicating more left-leaning governments). As before, this procedure “corrects” for cross-national differences in the ideological composition of the legislature, and the results are again consistent with our argument. Using the dichotomized variable as predictor, a shift from a PR to a majoritarian system alters the left-right balance by .17 after one period and by .62 in the long run. The long run effect is equivalent to 1.1 standard deviations.

Differencing is a powerful method because it “controls” for all variables that may affect the left-right balance in the legislature. It thus reduces potentially confounding variables to those that affect the post-election partisan composition of governments. While there are obviously many situationally specific factors that affect each instance of government formation, it is in fact not easy to think of variables that would *systematically* bias the composition of governments in one ideological direction or the other.

An exception is the extent of party fractionalization on either side of the center. Where the left (right) is relatively more divided than the right (left), we would expect government formation between left (right) parties to be more complicated under PR rules. Similarly, we would expect such fragmentation to produce more electoral defeats under majoritarian rules. If so, this could confound the relationship between electoral system and government partisanship. Thus, Rokkan (1950) and Boix (1999) argue that at the time of the extension of the franchise, when a united right faced a rising but divided left, the governing right chose to retain majoritarian institutions. Conversely, when a divided right faced a rising and united left, the response was to opt for PR. If this pattern of fractionalization persisted in the postwar period, the right would tend to have an advantage in majoritarian systems while the left would tend to have an advantage under PR. This is precisely the pattern that our model predicts, but for different reasons.

We tested for the alternative explanation by including the difference between party fractionalization on the left and right, where fractionalization is defined as one minus the sum of the squared seat shares held by parties to the left or right of the center (or 1 - the Hilferding index). The results are shown in column 4 of Table 5. Note that the effect of fractionalization is in the expected direction, although it is only borderline statistically significant. More importantly, we find no evidence that fractionalization changes the effect of electoral system on partisanship. This effect stays virtually unchanged.

[Table 5 about here]

The final test goes back to the absolute CoG measure. The reason is that the results for the difference measure could still mean that much of the variance in partisanship is due to factors other than electoral system. There are several plausible arguments. First, the power resources model implies that the electoral success of left parties depend on the size of the industrial working class and its level of organization (Korpi, Stephens). Second, voter non-turnout is concentrated among the poor we might also expect turnout to raise the level of support for left parties (Franzese 2002, ch 2; Lijphart 1997). Third, since working women and the elderly tend to be more dependent on transfers and welfare services (pensions, daycare, etc.), we might expect female labor force participation and the size of the old population to matter. Finally, it is sometimes argued that the level of income is associated with demand for more social protection (“Wagner’s law”), which could boost the support for left parties.

Column 5 of Table 5 shows the results of this test. The only variable (apart from electoral system) to register a significant effect is electoral participation. As expected, higher rates of participation benefits the left more than the right. More surprisingly, unionization and the size of the industrial work force do not appear to affect partisanship. These variables do register a significant effect in the expected direction when electoral system is excluded, but this merely suggests that the effects that are commonly attributed to these variables reflect an omitted variable bias. Needless to say, this is an issue that requires much more detailed analysis. We are satisfied, however, that electoral system not only matters for partisanship, but that it matters a great deal. And because the left redistributes more than the right, electoral system is an important part of the explanation for the observed variance in redistribution.

4. Conclusion

Policies to tax income and spend the receipts to increase equality are both complex and at the heart of democratic politics. Yet, the explanation for redistribution is fairly simple. It essentially reduces to the effect of two institutional variables: constitutional veto points, and, critically, the electoral system. The contribution of this paper is to explain, and empirically test, the role of these factors.

Electoral systems matter because they alter the bargaining power and coalition behavior of groups with different interests. In majoritarian systems, parties have to balance the incentive to capture the median voter with the incentive to pursue whatever policy is preferred by their core constituencies. Because the median voter tends to be closer to the distributive interests of the center-right party, any probability that parties will defect from their electoral platform once elected will tend to make the median voter more likely to vote for the center-right.

This result contrasts to multiparty PR systems where middle class parties have to compromise with left or right parties to govern. In this context, center parties will tend to find it in their own

interest to ally with the left party. This result follows when in addition to flat-rate benefits there are means-tested transfers, because the middle class can use the latter to bargain a more optimal tax rate that places most of the burden of funding the redistributive benefit on the rich. A notable exception to this logic is Switzerland because the collective executive in this country requires all major parties to consent to a policy. This makes it impossible to bypass the interests of higher income groups and undermines the pressure for redistribution.

We have shown that these propositions are consistent with data for redistribution, and to our knowledge it is the first time the close association between electoral system and government partisanship has been systematically documented, let alone explained. The findings raise several theoretical and empirical questions for further research. At the empirical level, a key question, which we have not addressed directly, is whether partisan governments also affect the primary distribution of income. As our results indicate, if this is the case it may help solve a long-standing puzzle in the political economy of the welfare state: the positive association between equality and redistribution.

Another major area of research is how to integrate arguments about the role of insurance into the model. Transfer spending not only redistributes but also provides insurance against income loss in the event of unemployment, sickness, etc. (Moene and Wallerstein 2001). We have argued elsewhere that there exists a strategic complementarity between such insurance and individuals' decisions to invest in particular types of skills (Iversen and Soskice 2001; Estevez et al. 2001). Specifically, if the government can credibly commit to redistributive spending, it serves as an insurance against the loss of income when specific skills are rendered obsolete by technological and other forms of change. The argument in this paper suggests that PR may be a key credible commitment mechanism in political economies that depend on workers making heavy investments in highly specific skills. The broader agenda is to link the nature of political institutions to what we know about the nature of economic institutions (such as vocational training systems).

Appendix A:
Model with endogenous preference over t

All assumptions in this appendix are the same as in the model presented in the body of the paper, except that the preferred tax level of each group is endogenously determined from the level of income of that group. The level of income for L, M and H are l , m , and h , and we assume linear preferences: $w_i = c$. Total income, $l+m+h$, is normalized to 3 so that average income is 1. And we assume that $m < \bar{y} = 1$: the median income is below average income. This is a standard assumption (critical to the Meltzer-Richard model) and is satisfied for all 14 cases that we use in the empirical analysis.

Each individual's income before tax is $y \cdot (1-\lambda)$ where $\lambda \in [0,1]$ is the proportion of an individual's time spent as leisure. We assume that $\lambda = \alpha \cdot t$ where α is a measure of the disincentive effect of taxation; $\alpha \in [0,1]$. Thus an individual's income before tax is now $y \cdot (1-\alpha t)$.⁸

The equations for after tax and transfer income are therefore:

$$\begin{aligned}\bar{l} &= l \cdot (1 - \mathbf{a}t) \cdot (1 - t) + f + g \\ \bar{m} &= m \cdot (1 - \mathbf{a}t) \cdot (1 - t) + f - \mathbf{e} \cdot \mathbf{a} \cdot g \\ \bar{h} &= h \cdot (1 - \mathbf{a}t) \cdot (1 - t) + f - \mathbf{a} \cdot (1 - \mathbf{e}) \cdot g\end{aligned}$$

where the government budget constraint is $f = (1 - \mathbf{a}t) \cdot t$.

Majoritarian elections. If M sets policies, it is straightforward to characterize what they are. First, and trivially, $g_M = 0$. Second, t is chosen to maximize $m \cdot (1 - \mathbf{a}t)(1 - t) + (1 - \mathbf{a}t) \cdot t$ subject to $0 \leq t \leq 1$. This implies

$$\begin{aligned}m \leq \left(\frac{1 - 2\mathbf{a}}{1 - \mathbf{a}} \right) &\Rightarrow t = 1 \\ \left(\frac{1 - 2\mathbf{a}}{1 - \mathbf{a}} \right) < m < \frac{1}{1 + \mathbf{a}} &\Rightarrow 1 > t = \frac{1 - m \cdot (1 + \mathbf{a})}{2\mathbf{a} \cdot (1 - m)} > 0 \\ m \geq \frac{1}{1 + \mathbf{a}} &\Rightarrow t = 0\end{aligned}$$

Note that t_M is equal to 1 only when m is sufficiently below 1 for the benefits of redistribution to

⁸ It complicates the maths without adding to the insight to assume that g has a disincentive effect. So a simple assumption is that g is a tax on wealth and wealth is proportional to base income.

more than completely compensate for the losses due to the disincentive effects of taxation. The higher is α (the disincentive effect) the lower is the $t_{M=1}$ level of m . And t_M is now equal to 0 below $m = 1$ also because of the disincentive effect: again it can be seen that a rise in α reduces this level of m . In the main text we assumed that M prefers a tax between the extremes of 0 and 1 (specifically 0.5).

Will the preferences of M prevail under plurality voting. The intermediate preferences method (that we also used in the main text) provides a set of sufficient conditions for Condorcet winners when preferences of different voter groups are closely enough aligned. Let P be the 2-element row vector, (f, g) , and P_M^* the 2-element row vector, (f_M, g_M) . We need to show that there is no feasible vector P , which can collect more than 50% of votes against $P_M^*=(t^*, 0)$. If H were to suggest to L a lower level of f in exchange for a higher (positive) level of g , the cost to H of g (H bears the full cost if we allow ε to go to zero) is greater than the gain from the fall in f .

More precisely, we show in Appendix A that the condition for P_M^* being a Condorcet winner is

$$a > \frac{h \cdot A - 1}{1 - l \cdot A},$$

where $A = \frac{1 + a - 2at}{1 - 2at}$. When this condition holds, voter preferences will be sufficiently

“close” to a uni-dimensional ordering that a Condorcet winner (the median voter) exists. We assume that this condition does hold.

Proportional representation.

The optimal policy vectors for L, M, and H are $P_L^*=(1, g^*)$, $P_M^*=(t_M, 0)$, and $P_H^*=(0, 0)$. Our argument, put most simply, is that L and M will form a governing coalition because they stand to gain much more for themselves from H, than M and H stand to gain from L. And this coalition will produce more redistribution than if M determined policies (as under plurality rules).

It is clear that an LM coalition will choose $g=g^*$ since that it is virtually costless to M. In exchange, M will expect to get a tax rate less onerous than that which bargaining between L and M without g^* would imply. What we will show is that in an LM coalition, $g=g^*$ and the chosen $t=t_{LM}$ will be less than that implied by $g^*=0$; in fact $\partial t_{LM} / \partial g^* < 0$. Thus M does less well than in a majoritarian system but better than in the absence of g .

The strategy is now to show under what conditions on g^* , l and α , the payoff to $m=1$ in an LM coalition is the same as the payoff to $m=1$ from an MH coalition. Since we know that $m \leq 1$, these conditions will guarantee that M will always choose L as its coalition partner. Hence these

conditions are sufficient for an LM coalition to form.

The LM coalition game takes place over $t \in [0,1]$. It is evident that M will concede $g=g^*$ to L in exchange for the lowest t possible, since $t_m=0$. This shown in the Rubinstein game as coming about through an increase in L's income of g^* and hence a reduction in the bargained tax rate: as we will see the logic here is that the absolute loss that L will incur as a result of the settlement being delayed is increased by $(1-\delta) \cdot g^*$. For tractability we adopt a straightforward linearization of net income, ranging between $t=0$ to 1:

$$\bar{m} = 1 - \mathbf{m} \cdot t = 1 - (1 - (1 - \mathbf{a})) \cdot t$$

$$\bar{l} = l + \mathbf{l} \cdot t + g^* = l + (1 - \mathbf{a} - l) \cdot t + g^*$$

Taking M's utility function first: when $t=0$, $\bar{m} = 1$, and when $t=1$, $\bar{m} = 1 - \mathbf{a}$ where $1 - \mathbf{a}$ is the uniform transfer payment when $t=1$. Similarly for L.

With equal discount rates for both L and M, and if the time lapse between offers is short, the Rubinstein bargain is given by

$$t_{LM} = \frac{1}{2} \cdot \left(\frac{1}{1 - (1 - \mathbf{a})} - \frac{l + g^*}{1 - \mathbf{a} - l} \right)$$

subject to $t_{LM} \in [0,1]$.

The intuition behind this result is roughly as follows: The higher is M's income (in fact 1 in this example) at $t=1$, the higher will be t_{LM} . This is because bargaining to prevent a reduction in t taking place is more costly to M the higher is M's pre-tax income. For exactly converse reasons, the higher is L's pre-tax income, $l+g^*$, the lower will be t_{LM} . Next, $(1 - (1 - \mathbf{a}))$ measures the cost to M of a one-unit increase in the tax rate: the higher this cost is the more will M bargain for a lower tax rate - as can be seen from the equation. Finally, and conversely, $((1 - \mathbf{a}) - l)$ measures the benefit to L of a higher tax rate; the more this is the lower will t_{LM} be reflecting the cost of waiting for the benefits of any particular rate of tax.

To find the payoff to $m=1$ of LM, we substitute t_{LM} back into M's utility function:

$$\bar{m}_{LM}(1) = 1 - \mathbf{a} \cdot t_{LM} = 1 - \frac{1}{2} \cdot \left(1 - \frac{\mathbf{a}}{(1 - \mathbf{a} - l)} \cdot (l + g^*) \right)$$

$$= \frac{1}{2} + \frac{\mathbf{a}}{1 - \mathbf{a} - l} \cdot \frac{l + g^*}{2}$$

The payoff to $m=1$ from the coalition MH is simple. Since both M and H have an interest in $g=0$

and $t=0$, those will define the MH bargain. Hence:

$$\bar{m}_{MH}(1) = 1$$

and the condition for $m=1$ choosing LM is:

$$\frac{\alpha}{(1-\alpha)-l} \cdot (l + g^*) \geq 1$$

Note that each of the three parameters has an unambiguous effect on the LHS. First, an increase in g^* increases the LHS: thus a decline in the power of veto players is associated with a higher probability of an LM coalition. It is moreover associated - within an LM coalition - with an increase in redistribution from H to L. Second, an increase in l , the income level of the low income group, increases the likelihood of an LM coalition. Indeed, if l is close to $1-\alpha$, an LM coalition is very likely to form. The significance of this finding is that a lower level of poverty is associated with greater redistribution, thus giving an additional take on the equality-redistribution puzzle. Finally, an increase in α makes LM more likely: the greater the tax disincentive to work, the more likely an LM coalition - this is because the stronger is this effect, the lower will be t_{LM} .

Crucial for our purposes, if an LM coalition forms as predicted, redistribution will be higher than under majoritarian rules. This is the case because g^* will always be positive and M would never want to bargain t below its preferred level, t_M . In fact, t would always be higher than t_M when g^* is sufficiently low.

Appendix B:
**Proof of the condition for a Condorcet
winner in majoritarian elections**

With M setting policy, L benefit from the flat rate transfer, f , paid out of general taxes. H, however, is hurt by such taxes and might consider an offer to the supporters of L that would encourage them to vote for the H party. Consider first how much L would need to get as compensation for a reduction in t and hence f . We find this number by differentiating the welfare function for L ($w_L = l(1 - at) \cdot (1 - t) + (1 - at) \cdot t + g$), which is

$1 - 2at - l \cdot (1 + a - 2at)$. The cost to H of providing this benefit is

$a \cdot [1 - 2at - l \cdot (1 + a - 2at)]$. The benefit to H of a reduction in t (and f) is the first order

condition for H's welfare function, which is $h \cdot (1 + a - 2at) - 1 + 2at$. In order for H to prefer a policy that would beat $P_M^* = (t^*, 0)$, the benefit of lower taxes would have to exceed the costs of higher direct transfer to L:

$$h \cdot (1 + a - 2at) - 1 + 2at > a \cdot [1 - 2at - l \cdot (1 + a - 2at)],$$

which is the condition for P_M^* being the Condorcet winner. The condition reduces to

$$a > \frac{h \cdot A - 1}{1 - l \cdot A}.$$

Appendix C
Summary statistics

Country means for variables used in regression analysis

	Redistri- bution	Inequal- ity	Left part- isanshi p	Labor power	Number of veto points	Elect- oral system	Per capita income	Female labor force parti- cipation	Old age populat- ion	Unem- ploy- ment
Australia	23.97	37.50	2.50	22.09	3	2.83	14179	57.65	10.75	7.34
Belgium	35.56	33.67	2.03	13.99	1	0.49	12363	51.97	14.52	10.77
Canada	21.26	35.83	1.67	2.44	2	2.91	14570	58.66	10.12	8.38
Denmark	33.63	32.50	1.11	29.42	0	0.80	13770	78.80	15.46	7.95
Finland	35.17	31.00	2.21	28.24	1	1.28	12750	71.70	13.56	9.87
France	25.36	39.40	2.17	1.76	1	2.21	12614	55.80	13.85	8.96
Germany	18.70	32.24	1.85	11.83	4	1.89	12327	52.31	15.10	6.35
Italy	12.13	35.67	2.26	5.77	1	1.51	12287	50.07	14.53	11.30
Netherlands	30.59	37.50	2.04	9.87	1	0.85	12417	50.20	12.64	9.03
Norway	27.52	29.75	3.00	29.93	0	1.62	14655	69.05	15.69	3.60
Sweden	37.89	32.67	2.59	39.50	0	1.66	12764	71.58	16.26	3.42
Switzerland	8.84	33.50	1.57	6.86	6	1.27	15017	61.35	14.44	1.70
United Kingdom	22.67	38.17	1.67	6.97	0	2.98	11118	59.37	14.71	6.33
United States	17.60	39.83	1.50	1.33	5	2.75	17051	64.30	11.94	6.10

Correlation matrix

	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10	-11	-12	-13	-14
(1) Redistribution	1													
(2) Inequality	-0.23	1												
(3) Left partisanship	0.24	-0.37	1											
(4) Labor power	0.51	-0.52	0.37	1										
(5) Number of veto points	-0.74	0.12	-0.23	-0.44	1									
(6) Electoral system	-0.61	0.38	-0.15	-0.41	0.27	1								
(7) Effective threshold	-0.62	0.44	-0.25	-0.46	0.30	0.90	1							
(8) Vote-seat disproportionality	-0.34	0.37	-0.17	-0.43	-0.08	0.82	0.87	1						
(9) Effective number of parties	-0.59	0.30	-0.15	-0.32	0.35	0.91	0.73	0.57	1					
(10) Vocational training	0.66	-0.35	0.20	0.34	-0.33	-0.91	-0.93	-0.76	-0.80	1				
(11) Adjusted tenure rates	0.40	-0.46	0.21	0.31	-0.08	-0.50	-0.75	-0.67	-0.26	0.68	1			
(12) Per capita income	-0.31	0.40	-0.20	-0.16	0.38	0.19	0.28	0.00	0.17	-0.28	-0.25	1		
(13) Female labor force participation	0.18	0.02	-0.02	0.46	-0.23	-0.02	-0.02	-0.07	-0.06	-0.06	-0.09	0.56	1	
(14) Unemployment	0.30	0.49	-0.29	-0.35	-0.15	-0.11	-0.01	0.06	-0.17	0.11	-0.06	0.08	-0.17	1

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Tables and figures

Table 1. Regression results for reduction in inequality (standard errors in parentheses)

	1	2	3	4	5
Constant	19.49 (12.38)	7.86 (8.95)	29.65** (11.62)	-22.43 (14.13)	8.58 (8.58)
Inequality	-13.58** (5.23)	3.05 (5.35)	15.16*** (4.42)	24.68** (10.19)	2.38 (4.59)
<i>Political variables:</i>					
left partisanship (contemporaneous)	-	-1.18 (1.19)	-	-	-
left partisanship (cumulative)	-		12.76*** (3.69)	-	-
left partisanship (Stephens-Huber)	-		-	0.90*** (0.28)	-
<i>Institutional variables:</i>					
Number of veto points	-	-2.27*** (0.65)	-1.05 (0.73)	-1.37 (0.79)	-2.49*** (0.74)
electoral system (majoritarianism)	-	-2.32*** (0.86)	0.40 (1.49)	-1.96 (1.15)	-2.53** (0.90)
<i>Controls:</i>					
Per capita income	-0.001** (0.001)	-0.000 (0.000)	-0.001 (0.001)	0.000 (0.001)	-0.000 (0.001)
Female labor force participation	0.62** (0.24)	0.42* (0.22)	0.25 (0.25)	-0.05 (0.20)	0.40 (0.23)
Old population	0.07 (0.56)	-0.41 (0.55)	-0.01 (0.63)	-1.23 (0.68)	-0.50 (0.51)
Unemployment	1.01 (0.51)	0.48 (0.40)	0.61 (0.39)	1.20 (0.30)	0.33 (0.39)
<i>R-squared</i>	0.58	0.66	.73	.78	.67
<i>N</i>	61	61	61	61	61

Significance levels: ***<.01; **<.05; *<.10 (two-tailed tests)

Note: Models include time dummies for years with more than two observations (not shown).

Table 2. Electoral system and left partisan orientation of the government, 1950-96.

	Electoral system score	Left partisan-ship score		Electoral system score	Left partisan-ship score
<i>“Majoritarian”</i>	UK	0.98	<i>“Proportional”</i>	Belgium	0.08
	Canada	0.91		Denmark	0.11
	Australia	0.84		Netherlands	0.12
	USA	0.78		Finland	0.18
	Japan	0.53		Italy	0.22
	Ireland	0.48		Norway	0.25
	France	0.45		Sweden	0.26
	(Germany)	(0.33)		Austria	0.30
<i>Mean</i>	0.66		<i>Mean</i>	0.19	2.34

Analysis of variance:

- <i>Within group variance</i>	0.04		0.06
- <i>Between group variance</i>		.20	
- <i>Total variance</i>		.25	
- <i>Percent variance explained by groups</i>		79	

Table 3. Electoral system and the number of years with left and right governments (1950-96)

		Government partisanship		Proportion of right governments
		Left	Right	
Electoral system	Proportional	197 (7)	75 (1)	0.28
	Majoritarian	50 (0)	274 (8)	0.85

Note: Excludes centrist governments (CoG=3) and PR cases with a majority to the left.

Table 4. Electoral system and the number of years with governments farther to the left or to the right than the legislature (1950-96).

		Government partisanship		Proportion of right governments
		Left	Right	
Electoral system	Proportional	201 (6)	106 (2)	0.35
	Majoritarian	75 (0)	250 (8)	0.77

Note: Excludes centrist governments (CoG=3) and PR cases with a single party majority.

Table 5. Regression results for government partisanship, 1950-96 (standard errors in parentheses)

	(1) Left government CoG	(2) Left government CoG	(3) Government minus leg- islative CoG	(4) Government minus leg- islative CoG	(5) Left government CoG
Constant	5.311*** (0.130)	5.044*** (0.139)	0.203*** (0.102)	0.068*** (0.118)	4.592*** (0.350)
Lagged dependent variable	-0.834*** (0.022)	-0.780*** (0.025)	0.720*** (0.027)	0.708*** (0.029)	-0.749*** (0.028)
Electoral system (majoritarianism)	-0.082*** (0.021)	-	-	-	-
Electoral system dummy	-	0.237*** (0.038)	-0.172*** (0.032)	-0.171*** (0.033)	-0.232*** (0.046)
Fragmentation (left minus right)	-	-	-	0.088* (0.046)	-
Electoral participation	-	-	-	-	0.004*** (0.002)
Manufacturing workforce	-	-	-	-	0.007 (0.005)
Unionization	-	-	-	-	-0.001 (0.002)
Inequality	-	-	-	-	-0.170 (0.314)
Income per capita	-	-	-	-	-0.000 (0.000)
Female labor force participation	-	-	-	-	0.001 (0.002)
Size of old population	-	-	-	-	0.004 (0.010)
<i>Adj. R-squared</i>	0.724	0.733	0.604	0.608	0.73
<i>N</i>	664	664	664	664	605

Significance levels: ***<.01; **<.05; *<.10 (two-tailed tests)

Note: Models estimated with a full set of year dummies (not shown).