

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 considerable variance in the extent to which democratic governments redistributes from higher to lower incomes. We show that the electoral system plays a key role 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 redistribution, government partisanship, and electoral system characteristics 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 et al., forthcoming), and it is also widely argued that left governments reduce wage inequality (Boix 1998; Iversen and Wren 1998). If parties reflect class interests, as argued by Huber, Stephens and their associates, this explanation jives well with Lowi's (1964) prediction that redistribution is dominated by class politics, and it could potentially explain why there is a negative relationship between inequality and redistribution once 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 will refer to 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 as a result of differences in electoral systems. Table 1 shows the strong empirical relationship using a new data set on parties and legislatures (see Cusack and Engelhardt 2002; Cusack and Fuchs 2002). The figures are the total number of years with right and left governments in 17 advanced democracies between 1945 and 1998, organized by type of electoral system. Mirroring a similar finding by Powell (2002), there is a strong association between the two variables: Among majoritarian systems, 75 percent of governments were center-right, whereas in PR systems 70 percent were center-left (excluding “pure” center governments). The numbers in parentheses convey a sense of the evidence at the level of countries, classifying countries according to whether they have an overweight (more than 50 percent) of center-left or center-right governments during the 1945-98 period. We explain the data (and the one outlier) in detail below.

[Table 1 about here].

The association in Table 1, we argue, arises because the electoral system affects coalition behavior and lead to systematic differences in the partisan composition of governments – hence to different distributive outcomes. The model we propose 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 and produces the exact opposite prediction than for majoritarian systems. To the best of our knowledge this is the first attempt to explain the partisan composition of governments by the nature of the electoral system - in part of course because the relationship has been only recently empirically established.

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. By linking redistribution and equality to long-term patterns of government partisanship, and partisanship to electoral system, the model helps solve both the equality-redistribution and the partisan dominance puzzles, and it adds to an emerging literature on the effects of electoral formula on government policies and economic outcomes (see Rogowski and Kayser 2002; Milesi-Ferretti, Perotti and Rostagno 2001; Tabellini 2000; Persson and Tabellini 1999; 2000; 2003),

Since there is very little theoretical or empirical work on the effects of electoral systems on redistribution via 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 the electoral system affects coalitional politics and hence the partisanship of the government. Redistribution is modeled as a function of partisanship. In the empirical section we first show that partisanship is key to explaining redistribution (using data from the Luxembourg Income Study), and then document the effects of electoral system on partisanship.

2. The argument

As in Persson and Tabellini (1999) we assume that there are three equally-sized income classes in the population, L (low), M (middle) and H (high). However, where Persson and Tabellini

(and Meltzer-Richard) assume two parties under PR, we allow three (minority) parties. In our view it makes little sense to assume two parties when the empirical literature shows that PR always produces multiple parties and coalition governments (there are 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 predicted by 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 (i.e., they are "class parties").

Following 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 $(1-g).g$ from H, with a small, but non-negligible, contribution $g.g$ from M. What we have in mind can be broadly thought of as a progressive income tax or perhaps a wealth tax to finance a means-tested benefit; it is in any case a tax which largely falls on high income earners.

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, we are assuming a benefit structure – a universalistic benefit supplemented by a means-tested benefit – that resonates well with empirical studies of the welfare state.

We assume further that the tax on higher income earners 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 " g with $>$ " >0 . We also

¹ This is the main way in which our model deviates from that presented in Persson and Tabellini (1999), which does not seek to explain partisan outcomes as a consequence of electoral systems. The two-party assumption in Persson and Tabellini does not make sense for PR systems, as the authors accept: "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."

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 coalition government of L and M. Loosely speaking, one can think of g^* as measuring the power of veto players in the system.

It is possible to present the model with preferences over taxation that are endogenously determined by the income of each group. However, we can derive all the key insights from a simple indirect utility function model, in which each group has preferences over t and g . The model with endogenous policy preferences is available from the authors upon request.

In the simple model, L is interested in maximizing g and t ; H in minimizing both g and t ; and M in setting t as close as possible to some intermediate level of t , which we assume to be 0.5, and in minimizing g . In terms of t this is the structure of preferences across income groups implied by the Meltzer-Richard model. The preferences over g follow trivially from the assumptions we have made. The goals of the three groups therefore are

$$u_L = g + t$$

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

$$u_H = -t - g \cdot (1 + \mathbf{a}) \cdot (1 - \mathbf{e})$$

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, the other the center-right, and each 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. Figure 1 therefore illustrates the logic. The transfer g is on the horizontal axis and the tax t is on the vertical axis. The indifference curves for L and H are drawn through $m^* = \{g, t\} = \{0, 0.5\}$, the median voter's ideal point. The relevant indifference curve of L, $u_L(m^*)$, is downwards sloping with a gradient of -1. That of H, $u_H(m^*)$, is downwards sloping with a gradient of $-(1+\alpha)(1-g)$. $u_H(m^*)$ is steeper than $u_L(m^*)$ if $\alpha > g/(1-g)$, which we will assume to be the case. Utility for L improves in a north-easterly direction with increasing g and t ; for H the opposite is the case. Thus it can be seen that the LH winset of m^* is empty so that no alternative platform will attract the votes both L and H. Hence m^* is the Condorcet winner.

[Figure 1 about here]

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. 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 shares 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? Most existing answers in the party literature 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 core

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 their median constituents. This incentive is tempered by the concern for cultivating a reputation for reliability, but reputation is an imperfect commitment mechanism in a 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 of pursuing 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. In Figure 1 they are the distance between m^* and the preferred policy of CL, cl^* , and CR, cr^* .

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.² 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

$$T_{CL} - c_{CL} = g^* + 0.5 - c_{CL} \text{ and the payoff to the right party is } T_{CR} - c_{CR} = 0.5 - c_{CR}.$$

² An additional possibility is that voters punish defecting governments in future elections, but this adds to the complexity of the model without altering its insights.

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 $T_{CR} > c_{CR}$ the median voter would vote center-left. 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 the 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. This matters only because some parties in the empirical analysis are classified as “center parties”. Specifically, if the center party represent middle class voters, then it would be more attractive to the median voter than the center-right party. But if the “center party” is really a center-left party with a platform mirroring the preferences of the median voter, whereas the center-right party has a platform that deviates to the right, then the prediction is ambiguous since the “center party” is closer to the median voter, yet faces a greater incentive to defect. Since no existing data clearly distinguish between these different “types” of center parties, we cannot form 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. And since there is no imperative under PR to win the median voter, a party does not have the incentive to adopt a platform that is different from the optimal policies of its class. And if it did, it would not be credible. Indeed, we see this distinction between the credible commitment of representative parties under PR and the difficulty representative parties have to commit to a median voter platform under majoritarian arrangements as one of the central differences between the two types of electoral systems. Based on these assumptions, we will show that under the conditions of the PR model developed below there exists a unique policy equilibrium that favors center-left coalitions and redistribution -- the exact opposite of the prediction under majoritarianism.

On the face of it, coalitions between M and H would seem 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, *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 -0.25 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 a low cost that reflects the progressive nature of the tax (i.e., most of the cost is paid by H). In exchange for such concessions, M can demand a tax rate that is closer to its preferred rate. Specifically, for suitably low g the Rubinstein bargaining solution is $.75 - g^*/2$ (see Appendix A). Thus a bargain with L will always be closer to M's preferred policy than 0.75. M has no such bargaining leverage over H and the outcome of that bargain would therefore be a simple split between preferred tax rates (0.25). Consequently, M prefers to be in a center-left coalition.

The following model demonstrates this conclusion more formally and addresses the objection that H can always break an LM coalition by offering M a deal that is closer M's ideal policy. This cannot happen, it turns out, if there is *any* cost of coalition breakup because that prevents H from making a credible offer to M.

Figure 2 shows the argument as an extensive game with complete and perfect information. Without serious loss of generality, M is charged with coalition formation (the decision node at the top of the game) and can either choose L or H to enter into coalition bargaining³. Suppose M chooses L. At that point a Rubinstein-type alternating offers infinite-move bargaining sub-game begins. During the sub-game there is a discount factor, δ^s , attached to the payoff after s bargaining rounds. Without significant loss of generality it is assumed that the party to whom the proposal is made has the first move. Thus we are at the top-left L decision-node. We assume that $g = g^*$ as part of the ML bargaining⁴ so that the bargaining sub-game entails alternating offers of the tax rate. Starting with L's first move, the closed interval of possible tax rates, $t \in [0,1]$, is given by the base line of the triangle at the apex of which is L's decision node. L's choice of a tax rate offer is indicated by a line from L's decision node to the base of the triangle. M now has the move and has three alternatives: (1) To accept L's offer, in which case the game ends and an ML coalition is established with $g = g^*$ and the tax rate being that offered by L (2) To reject L's offer and to make a counter-offer to L - the line from M's decision node down to the base of the triangle. Or (3) to break off negotiations with L and enter into negotiations with H. If (2)

³ Again for simplicity we assume that parties do not reject an offer of coalition bargaining.

⁴Which implies from the solution to the Rubinstein sub-game that the equilibrium tax rate will be lower (in M's favor).

L can then choose whether to accept M's offer, so that the game ends; or to reject it and make a counter-offer. M again has the threefold options of acceptance, of rejection and making a new offer, or of breaking off negotiations with L. And so on. It is assumed that whenever the game ends with the establishment of a coalition a discount factor δ^S is applied to the utility of the parties where S is the number of bargaining rounds which have elapsed.

[Figure 2 about here]

We further assume, realistically we believe, that if M enters into and then breaks a coalition, M incurs a cost of $C > 0$. What we have in mind here is the cost of breaking off negotiations once they have started. These costs can be substantial because they are accompanied by discord and put on public display the inability of M to negotiate successfully. But whatever their size, we will see in a moment that *any* positive cost of breaking off negotiations will prevent H from underbidding a coalition of L and M that is based on a Rubinstein solution.

For simplicity we also assume that M can only once break off negotiations. If M for instance breaks off negotiations with L then M must continue bargaining with H until a coalition agreement has been reached. In fact the results go through in a model in which M can break off negotiations an infinite number of times, so long as C is strictly positive and incurred on each break-off situation. The proof is available from the authors on request.

The SGPE can be worked out through backward induction:

- (1) The SGPE solution to the bargaining sub-game between M and L, *absent* M's outside option of breaking off negotiations and switching to negotiate with H, is for L at its first move to offer $t = .75 - g^*/2$ to M and for M to accept this offer, as δ^* goes to unity. This is the standard Rubinstein result (see appendix A).
- (2) Similarly, the SGPE solution to the bargaining sub-game between M and H as result of M breaking with L is $t = .25$, as δ^* goes to unity
- (3) The SGPE of the bargaining sub-game between M and L, *including* M's outside option to switch

to bargaining with H is the same as the solution without the outside option, i.e. that in (1)). This follows from a minor modification of Proposition 5.1 of Muthoo [1999]: If the value to M of the outside option is less than the value of the sub-game without it, the outside option is irrelevant.

(4) The SGPE of the bargaining sub-game between M and H, *including* M's outside option to switch to bargaining with L requires us to evaluate the payoff to M if M responds to an offer by H by breaking negotiations and switching to L. From (1) the outcome of the subsequent bargaining sub-game between M and L is $t_{ML} = .75 - g^* / 2$. However, this result can now be incurred only at a cost of C. H will therefore offer M a deal that is worse than $.75 - g^*/2$ by an amount equal to C and M will accept this

In combination, (1), (2), (3), and (4) imply that M chooses initially to negotiate with L: This is because an initial negotiation with L results in $u_M(t_{ML}, g^*)$ where $t_{ML} = .75 - g^* / 2$ (from (1)); but an initial negotiation with H results in $u_M(t_{ML}, g^*) - C$ (from (4)). Hence an ML coalition will result with $t_{ML} = .75 - g^* / 2$ and $g = g^*$.

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 we use partisanship as explanatory variable to account for differences in the level of redistribution. In the second part we use partisanship as the dependent variable, testing the proposition that electoral system shapes coalition behavior and therefore the composition of governments. To our knowledge, the effects of electoral system on government partisanship and redistribution 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 database 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 calls it) to ensure they are comparable across 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, Brady 2003).

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, which falls as income is shifted from those with high to those with lower incomes. It varies from 0 (when there is a perfectly even distribution of income) to 1 (when all income goes to the top decile). Using an adjusted version of the LIS data – constructed by Huber, Stephens and their associates (Bradley et. al., forthcoming)⁵ – 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).

⁵ We are grateful to the authors for letting us use their data.

On the independent side, the key variable for explaining redistribution is government partisanship, which is an index of the partisan left-right “center of gravity” of the cabinet based on i) the average of three expert classifications of government parties’ placement on a left-right scale, weighted by (ii) their decimal share of cabinet portfolios. The index was conceived by Thomas Cusack who generously shared all the data in a new comprehensive source on parties and partisanship (see Cusack and Fuchs 2002, and Cusack and Engelhardt 2002 for details). The expert codings are from Castles and Mair (1984), Huber and Inglehart (1995), and Laver and Hunt (1992). For the purpose of explaining partisanship the key variable is electoral system. We use several different measures that are explained in detail in the partisanship section below.

We also controlled for variables that are commonly assumed to affect redistribution, most notably income inequality. These variables, with definitions, sources, as well as a short discussion of causal logic, are listed below. Country means and a variable correlation matrix are provided in Appendix B.

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).

Unionization. According to power resource arguments, high union density should lead to more political pressure for redistribution while simultaneously affecting the primary income distribution (see Huber and Stephens 2001 and Bradley et al., forthcoming). The data are from Visser (1989; 1996).

Voter turnout. Meltzer and Richard (1981) argues that the extension of the franchise reduced the income of the median voter and raised the demand for redistribution. A similar logic may apply to voter turnout if non-turnout is concentrated among the poor as some research suggests (Lijphart 1997). The data are from annual records in Mackie and Rose (1993) and in International Institute for Democracy and Electoral Assistance (1997).

Vocational training. Iversen and Soskice (2001) argue that people with specific skills are more likely to support social insurance with a redistributive component. As an indicator of the extent to which workers are schooled in specific vocational skills, as apposed to general academic skills, we use the share of an age cohort that goes through a secondary or short-term post-secondary vocational training. The data are from the UNESCO Statistical Yearbook (New York: UNESCO, various years).

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 social insurance is income elastic and therefore will tend to raise spending and redistribution. 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.

3.2. Statistical model

Our starting point is a simple error correction model. In this model, current redistribution is equal to past redistribution plus a contribution from redistributive partisan policies that deviate from policies that would preserve the status quo level of redistribution:

$$R_{i,t} = \mathbf{1} \cdot [\mathbf{a} + \mathbf{b} \cdot P_{i,t} - R_{i,t-1}] + R_{i,t-1} + u_{i,t}$$

where u is identically and independently distributed with mean 0 and variance s_u^2 .

With our data on redistribution, however, we cannot estimate this model directly since the

observations on the dependent variable for each country are unequally spaced, varying between 2 and as many as 10 years. To deal with this problem we develop a modified version of the model where we substitute the above expression for $R_{i,t-1}$, $R_{i,t-2}$, etc., until we get to another observation of the lagged dependent variable. This procedure yields the following expression:

$$R_{i,t} = I \cdot \mathbf{a} \cdot \sum_{s=0}^N (1-I)^s + I \cdot \mathbf{b} \cdot \sum_{s=0}^N (1-I)^s \cdot P_{i,t-s} + (1-I)^{N+1} \cdot R_{i,t-N+1} + \sum_{s=0}^N (1-I)^s \cdot u_{i,t-s}$$

or

$$R_{i,t} - (1-I)^{N+1} \cdot R_{i,t-N+1} = I \cdot \mathbf{a} \cdot \sum_{s=0}^N (1-I)^s + I \cdot \mathbf{b} \cdot \sum_{s=0}^N (1-I)^s \cdot P_{i,t-s} + \sum_{s=0}^N (1-I)^s \cdot u_{i,t-s}$$

The second term in the last expression is a measure of the cumulative effect of partisanship over a period of N years, where N is the gap between the current and previous observation. Of course, in so far as other variables affect redistribution we need to calculate the cumulative effects of these in precisely the same manner as for partisanship. Since we have annual observations for partisanship and all the control variables, the estimated model is based on complete time series except for the dependent variable. The model is estimated by choosing a value for β that maximizes the explained variance.

Given our assumptions the composite errors are serially uncorrelated⁶, but because the error term depends on N , there is heteroscedasticity. To adjust for this, as well as contemporaneous correlation of errors, we use panel corrected standard errors as is common when analyzing pooled cross-sectional time-series data (see Beck and Katz 1995).

The model used to explain partisanship in the second part of the analysis is not constrained by time gaps, and we therefore employ a standard lagged dependent variable model with panel robust standard errors. The exact procedure is explained in the relevant section.

⁶ $E \left(\sum_{s=1}^{N_1} \left[(1-I)^s u_{i,t-s} \right] \cdot \sum_{s=1}^{N_2} \left[(1-I)^s u_{i,t-(N_1+1)-s} \right] \right) = 0$ since the errors in the first square

bracket run from $u_{i,t}$ to $u_{i,t-N_1}$ and in the second from $u_{i,t-(N_1+1)}$ to $u_{i,t-(N_1+1)-N_2}$

3.3. Findings

3.3.1. *Redistribution.* We begin our presentation with the results from estimating a simple baseline model with economic variables only (column 1 in Table 2). As expected, female labor force participation and unemployment are associated with more redistribution. Contrary to Wagner's Law, higher per capita income slightly reduces redistribution. With the exception of unemployment, none of these effects are robust 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 Meltzer and Richard. This negative effect is statistically significant at a .01 level, and the substantive impact is also strong: a one standard deviation increase in inequality is associated with a .3 standard deviation reduction in redistribution.

[Table 2 about here]

Model 2 introduces five political-institutional variables: government partisanship, voter turnout, unionization, veto points, and vocational training. All variables carry the expected sign, and all but voter turnout have statistically significant effects. The effects of partisanship and vocational training are the strongest both substantively and statistically. Thus, a one standard deviation change in either partisanship or vocational training intensity is a one quarter standard deviation reduction in redistribution.

Another notable change in moving from the baseline model to the full model is that the effect of inequality *reverses* (though it is not significant). One likely reason for this change is that left governments (and strong unions) 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, excluding partisanship produces an omitted variable bias on the coefficient for inequality.

Such a bias may also be caused by other variables. Experimentation with including one variable at a time shows that vocational training and the number of veto points also contribute to the shift in the sign for the inequality variable. In the case of vocational training the likely reason is that emphasis on specific skills simultaneously produces a more compressed skill and wage structure *and* increases electoral support for spending. Similarly, multiple veto points are likely to impede policies to both redistribute and reduce inequality, thereby contributing to a negative sign on inequality when the veto points variable is excluded. Obviously, these are conjectures that need to be substantiated by further empirical analysis. For our purposes the key result is the one for partisanship, which is strong and consistent across model specifications. This confirms a similar result in Bradley et al. (forthcoming), which is based on a different statistical approach.

To check the robustness of our results we also estimated the model using reduction in the poverty rate instead of reduction in the gini coefficient as the dependent variable. Redistribution in the poverty rate is the percentage change in the share of families below 50 percent of the median income, from before to after taxes and transfers. The results by and large confirm those in Table 2. Partisanship and vocational training continue to be the strongest predictors (and significant at a .01 level). However, the effect of turnout is now significant while the sign on unionization turns negative and borderline significant. Some of the negative effect of inequality also remains after inclusion of all controls. Clearly, one must be cautious interpreting the effect of inequality given how unstable it is across model specifications.

3.3.2. Partisanship. While government partisanship is important in explaining redistribution, partisanship itself is a function of coalitional politics, which is shaped by electoral systems. A 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. Put differently, partisanship is the mechanism through which electoral system exert an effect on redistribution.

To test this implication we use the partisan center of gravity (CoG) index as a dependent variable and indicators for party and electoral systems as independent variables. We have data for 18

countries that have been democracies since the Second World War, beginning with the first democratic election after the war and ending in 1998. One country -- Switzerland -- has a collective executive that prevents coalition politics from having any influence on the composition of the government. We therefore exclude this case from the analysis, although all the reported results in this section go through with Switzerland included.

In the theoretical analysis we made a distinction between majoritarian two-party systems and proportional multiparty systems. In the former, only one party can win the election, which determines who forms government, whereas in the latter no party can form government without the support of one or more parties. The distinction underscores the importance of whether governments are formed through post-election coalitions or as more or less direct outcomes of elections. Yet, in practice the dichotomy is complicated by the fact that voters' expectations about government formation affect the partisan distribution of support. Where a single party can reasonably be expected to form government without the support of third parties, our model implies that strategic voting will favor the right and thus government composition, *even* if the government is ultimately formed as a coalition. We therefore cannot simply look at the number of parties in government at any given moment in time, but must take into account the institutionally mediated expectations of voters.

We do not have direct measures of voter expectations, but we do know the nature of national electoral systems, which are distinguished in the first column of Table 3. Our strategy is simply to link electoral rules to the expectation voters can reasonably be assumed to have concerning the nature of the government formation process. With the possible exception of Austria (because of the strong position of the two main parties), all PR systems clearly give rise to expectations of governments based on support from more than one party. This is not the case in any of the non-PR systems, although Australia and Ireland *have* experienced several instances of coalition governments. Ireland is perhaps the most ambiguous case, but the inclusion or exclusion of this cases makes little difference to the results.

[Table 3 about here]

The division into PR and majoritarian systems is buttressed by quantitative measures of party and electoral systems. First, countries with majoritarian systems tend to have fewer parties than countries with PR systems. This is indicated in the third column of Table 3 using Laasko and Taagepera's (1979) measure of the effective number of parties in parliament.⁷ France is somewhat of an outlier, but at least in presidential elections the second round of voting in the French run-off system typically involves only candidates from two parties.

The second quantitative indicator, the proportionality of the electoral system, is a composite index of two widely used indices of electoral system. One is Lijphart's measure of the effective threshold of representation based on national election laws. It indicates the actual threshold of electoral support that a party must get in order to secure representation. The other is Gallagher's measure of the disproportionality between votes and seats, which is an indication of the extent to which smaller parties are being represented at their full strength. Both indicators were standardized to have a mean of zero and a standard deviation of 1 before being averaged into an index that varies from low proportionality (0) to high proportionality (1). The data are from Lijphart (1994).

The proportionality index is consistent with the division into majoritarian and proportional groups. There are no cases that should be "switched" based on their value on the index, although Ireland and Japan have relatively high scores among the majoritarian countries. Coupled with the other information in Table 3, the dichotomous division of countries into two types thus seems sensible. However, we will test for the robustness of our findings by using the effective number of parties and the proportionality index as alternative measures of electoral system in the regression analysis.

Table 1 presented in the beginning of this paper is a simple cross-tabulation of electoral system and government partisanship using annual observations as the unit of analysis. The numbers exclude all years with "pure" center governments since, as noted above, 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

⁷ The effective number of parties 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).

majoritarian rules.⁸ We also excluded all observations from PR systems with single-party majority governments. There were 40 such cases, of which 32 were left-of-center governments (thus weakening our results). The reason for doing this is that single majority governments are not the result of party coalitions, although it should be noted that it is in fact entirely consistent with our theory that left and center parties, but not center and right parties, would amalgamate to reduce transaction costs.

As noted in the introduction, there is only one country, Germany, that does not conform to the predicted pattern. In this case there were 33 center-right governments and only 16 center-left governments. To understand this, we believe that one needs to pay attention to the unique constellation of parties in Germany. For most of the postwar period the German legislature has been dominated by only three parties, a large social democratic party (SPD), a large Christian democratic party (CDU/CSU), and a small liberal party (FDP). The CDU, considered a center party on social issues, thus faced a small party to its right and a large party to its left, whereas the model assumes equally-sized parties. If bargaining power is dependent on size, the German party system produces an interesting twist on our story since the low bargaining power of FDP may enable it credible to offer concessions to CDU that are superior to those SPD can 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 (as reflected in relatively low levels of redistribution for a PR country).

Germany aside, it can be objected to the evidence in Table 1 that it does not take into account that the left-right balance of governments is also affected by the left-right balance of power in the legislature. Center parties may be more likely to ally with left (right) parties when more seats are concentrated on the left (right). In our theoretical model, however, the distribution of seats does not matter for our predictions so long as coalitions can be formed that are either to the left or to the right of

⁸ The composite CoG index does not explicitly distinguish center parties. However one of its constituent measures, that by Castles and Mair, does. They use a five point scale where 3 is explicitly defined as the center. We use this information to identify pure center governments.

the center. That is always a possibility except when a left or right party holds an absolute majority. And the latter cases were excluded from Table 1.

Nevertheless, we tried to calculate the *difference* between the left center of gravity score for the government and for the legislature. 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 cases of single-party majority governments. The results are reported in Table 4.

For the majoritarian cases the numbers are basically unchanged. 73 percent of governments in majoritarian systems are to the right of center, far more than in PR systems where 54 percent are to the left of center. Yet the number for PR is notably smaller than before. The main reason is Italy. Although this is an almost pure case of PR (before 1994), we find that every single non-centrist government is the right-of-center. The Italian case thus seems to run against our argument.

[Table 4 about here]

But the raw numbers mislead. In every one of the 30 observations before 1995 where coalition governments were to the right of the legislative center, the ideological complexion of the government was in fact to the *left* of the large and pivotal Christian democratic center party. 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 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, but the party causes the legislative CoG to be quite far to the left.

This pattern of coalitions in Italy is clearly consistent with our argument, and if we reclassify the 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 54 to 63 percent (the revised numbers are shown in brackets).

The Italian case shows that it is in fact quite possible to have center-left coalition governments

to the right of the legislative center of gravity. This suggests that it is more appropriate to compare government composition to the overall center of the scale. Yet, Table 4 does indicate a difficult case: the Netherlands. In the Dutch case there was a slight overweight of center-right governments (29 versus 22). 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. A more refined version of our bargaining model would take into account differences in bargaining power due to differences in party size.

Be that as it may, we can confirm the substantive and statistical significance of the bivariate relationships through multivariate regression (see Table 5). No effort has been made here to “correct” the Italian data.

The first column shows the effect of the electoral system variable on the center of gravity score, controlling for a lagged dependent variable (like before, the analysis excludes pure center governments). As expected, PR electoral systems are significantly associated with left-of-center governments. This relationship also holds when we use the effective number of parties and the proportionality index as proxies for the electoral system (column 2 and 3). Although both of these alternative variables register strong effects, the dichotomized variable performs slightly better, suggesting that it is appropriate to treat electoral system as discontinuous rather than continuous.

In substantive terms, the results indicate that going from a majoritarian to a PR system reduces the predicted center of gravity of the government by .07 after one period and by .31 in the long run. A difference of .31 on the CoG measure is roughly equivalent to the difference between a typical social democratic and a typical Christian democratic party, or between the latter and a typical conservative party. Another way to convey the result is that the long-run effect is equivalent to 1.2 standard

deviations on the dependent variable – a large impact by any standard.

In column 3 we use the *difference* between the government and the legislative center of gravity (higher values indicating more right-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 electoral system variable as predictor, a shift from a PR to a majoritarian system alters the left-right balance by .05 after one period and by .19 in the long run. The long run effect is equivalent to .83 standard deviations on the dependent variable.

Differencing in this manner is a powerful test 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 a plethora of situationally specific factors that shape 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 important 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, as argued by Powell (2002), 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. Specifically, Rokkan (1970) and Boix (1999) have argued 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 this 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 to the right of the center (Rae 1968). The results are

shown in column 4 of Table 5. As expected, greater fractionalization on the left significantly reduces the likelihood of getting a center-left government. Thus, a one standard deviation increase in left fractionalization shifts the predicted center of gravity measure .4 standard deviations to the right. Importantly for our purposes, however, including fractionalization has no effect on the estimated parameter for electoral system. It is virtually unchanged.

[Table 5 about here]

The final test goes back to the absolute CoG measure. The reason for doing this is that the results for the difference measure could still mean that much of the variance in government 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 1983, Huber and Stephens 2001). 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 unemployed tend to be more dependent on transfers and welfare services (unemployment benefits, daycare, etc.), we might expect female labor force participation and unemployment to favor the left. Finally, as already noted, Wagner's law implies income is associated with demand for more social protection, which may also boost support for left parties.

Column 5 of Table 5 shows the results of this test. The only variable – apart from electoral system and left party fragmentation – that registers a marginally significant effect is unemployment. Rather surprisingly, unionization and the size of the industrial work force show no effect on partisanship. These variables *do* show some effects in the expected direction when electoral system and left fractionalization are excluded, and there is a strong negative correlation between unionization and fractionalization ($r=-.78$). Clearly, the strength and unity of the union movement affect the divisiveness of the political left, and hence its likelihood to govern. Needless to say, this is an issue that requires 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 cross-national variance in redistribution.

4. Conclusion

Tax and spend policies for the purpose of redistribution are multifaceted and complex, but the explanation for redistribution is fairly simple. To a very considerable extent, redistribution is the result of electoral systems and the class coalitions they engender. The contribution of this paper is to provide a model that explains this effect, and to empirically test this model.

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 the policy 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. This result follows when in addition to flat-rate benefits there are means-tested transfers, because the middle class can then use the latter to bargain a tax rate closer to their preference while placing most of the burden redistribution 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). It has been 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 thus to link the nature of political institutions to what we know about the nature of economic institutions (such as vocational training systems).

Finally, the model suggests an explanation for democratic institutional design. Pre-democratic parties representing the rich often have the capacity to shape democratic institutions when such institutions are perceived as the only viable alternative to revolution (Acemoglu and Robinson, forthcoming). Our model and evidence suggest that forward-looking politicians have a vested interest in choosing majoritarian institutions. The exception is when the poor is a majority and the only defense of the middle and upper classes is to adopt PR with as many minority guarantees as possible (in our model the median voter is assumed to be from the middle class). The prediction thus depends on the distribution of income, where a higher concentration of poor is expected to lead to PR.

Appendix A :

Rubinstein bargaining solution for LM and MH coalitions

(a) LM coalition: The Rubinstein solution is derived in the absence of outside options. The bargaining over t ranges from $1/2$ to 1 and the bargain over g ranges from 0 to g^* . The normalized utility functions for L and M can be written as:

$$\hat{u}_L = u_L(t, g) - u_L(.5, 0) = t + g - .5 \text{ and } \hat{u}_M = u_M(t) - u_M(1) = -|t - .5| + |.5|$$

In the following proof we assume that $g = 0$, but the result holds for small enough g^9 . Two conditions need to be satisfied in a multidimensional bargain (Kreps, 1990, p561, Proposition 2): First, L's offer to M must be worth at least as much to M now as M's offer to L next period will be worth to M now:

$$(A.1) \quad \hat{u}_M(t^L) = \mathbf{d} \hat{u}_M(t^M)$$

This implies:

$$\begin{aligned} -|t^L - .5| + .5 &= -\mathbf{d} |t^M - .5| + .5\mathbf{d} \\ \Rightarrow t^L &= (1 - \mathbf{d}) + \mathbf{d}t^M \end{aligned}$$

And, second, M's offer to L must be worth at least as much to L now as L's offer to M next period

⁹Follow the proof through using $\hat{u}_M = -|t - .5| + |1 - .5| + (1 + \mathbf{a})\mathbf{e}(g^* - g)$. This generates the necessary condition $t = .75 - g / 2 + (1 + \mathbf{a})\mathbf{e} \cdot (g^* - g) / 2$. The condition for

$\frac{\partial \hat{u}_M}{\partial g} > 0$ is $\mathbf{e} < \frac{1}{1 + \mathbf{a}}$.

will be worth to L now:

$$(A.2) \quad \widehat{u}_L(t^M, g^M) = \mathbf{d} \cdot \widehat{u}_L(t^L, g^L) \text{ which implies}$$

$$t^M + g^M - .5 = \mathbf{d} \cdot (t^L + g^L - .5)$$

Solving for t^M in terms of g^M and g^L gives

$$t^M = \frac{1 + .5\mathbf{d}}{1 + \mathbf{d}} - \frac{(\mathbf{d}g^M - \mathbf{d}^2g^L)}{(1 - \mathbf{d})(1 + \mathbf{d})}$$

As $\mathbf{d} \rightarrow 1$ so the difference between first and second mover offers goes to zero, so that

$$(A.3) \quad t = .75 - g / 2$$

(A.3) is a necessary condition for the unique SGPE of this bargaining game. If (A.3) is substituted into \widehat{u}_M and \widehat{u}_L so that both are functions of g alone, the assumption of Pareto optimality implies that, so

$$\text{that } t_{LM} = .75 - g^*/2 \in$$

(b) MH coalition: Bargaining is over t in the range $[0, .5]$. It is in the common interest of both parties to agree on $g = 0$. The normalized utility functions are $\widehat{u}_M = -|t - .5|$ and $\widehat{u}_H = -t$. The conditions for a SGPE are

$$(A.4) \quad -|t^H - .5| = -\mathbf{d} |t^M - .5| \text{ and}$$

$$(A.5) \quad -t^M = -\mathbf{d}t^H$$

and these imply

$$(A.6) \quad t^H = .5/(1 + \mathbf{d})$$

or as $\mathbf{d} \rightarrow 1, t_{HM} \rightarrow .25. \text{€}$

Appendix B
Summary statistics

Country means for variables used in regression analysis

	Redis- tribut- ion	Inequ- ality	Parti- san- ship	Voter turno ut	Unio- nizati on	Veto point s	Vocat ional traini ng	Elect- oral syste m	Effect i-ve numb er of partie s	Frag- ment at-ion	Per capita incom e	Female labor force partici- pation	Une- m- ploy- ment	Manuf- actur- ing work- force
Australia	23.97	1.70	0.59	84	46	3	0.9	0.20	2.5	-0.39	10909	46	4.63	21
Austria	-	-	0.37	87	54	-	-	0.90	2.4	-0.18	8311	51	2.76	26
Belgium	35.56	1.64	0.46	88	48	1	56.3	0.87	5.2	-0.34	8949	43	7.89	23
Canada	21.26	1.82	0.45	68	30	2	4.6	0.14	2.2	0.18	11670	48	6.91	18
Denmark	37.89	1.58	0.44	84	67	0	31.8	0.96	4.4	-0.40	9982	63	6.83	24
Finland	35.17	1.68	0.37	79	53	1	32.9	0.87	5.1	-0.18	8661	66	4.48	23
France	25.36	1.94	0.50	66	18	1	27.9	0.18	3.8	0.10	9485	51	4.57	23
Germany	18.70	1.70	0.49	81	34	4	34.9	0.91	2.6	-0.13	9729	51	4.86	29
Ireland	-	-	0.53	75	48	-	-	0.70	2.8	-0.33	5807	37	9.09	16
Japan	-	-	0.98	71	31	-	-	0.61	2.6	0.22	7918	56	1.77	23
Italy	12.13	1.63	0.46	93	34	1	37.5	0.92	3.8	0.20	7777	38	8.12	20
Netherlands	30.59	1.64	0.38	85	33	1	42.5	1.00	4.6	0.18	9269	35	4.62	20
New Zealand	-	-	0.54	-	-	0	37.4	-0.00	2.0	-0.40	-	-	-	-
Norway	27.52	1.50	0.19	80	54	-	-	0.77	3.3	-0.02	9863	52	2.28	22
Sweden	37.89	1.58	0.44	84	67	0	33.2	0.96	4.4	-0.40	9982	63	6.83	24
Switzerland	8.84	1.68	0.32	35	32	6	35.5	0.86	5.3	0.16	12377	53	0.78	32
U.K.	22.67	1.78	0.65	76	42	0	10.4	0.17	2.1	0.08	9282	54	5.01	28
U.S.	17.60	2.07	0.50	56	23	5	2.9	0.39	1.9	0.00	13651	53	5.74	20

Note: Time coverage is 1950-96 except for redistribution and inequality, which are restricted to the LIS observations. Excludes Switzerland.

Correlation matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1) Redistribution	1.00												
(2) Inequality	-0.47	1.00											
(3) Partisanship	-0.58	0.48	1.00										
(4) Voter turnout	0.32	-0.76	-0.05	1.00									
(5) Unionization	0.67	-0.71	-0.42	0.49	1.00								
(6) Electoral system	0.38	-0.70	-0.42	0.31	0.47	1.00							
(7) Effective number of parties	-0.66	0.56	-0.39	-0.03	0.18	0.57	1.00						
(8) Left fragmentation	-	-	0.27	-0.40	-0.78	-0.24	-0.07	1.00					
(9) Number of veto points	-0.55	0.64	0.45	-0.56	-0.53	-0.27	0.58	-	1.00				
(10) Vocational training	0.32	-0.60	-0.46	0.52	0.23	0.79	-0.83	-	-0.29	1.00			
(11) Per capita income	-0.20	0.39	-0.27	-0.56	-0.21	-0.30	-0.08	0.10	0.53	-0.43	1.00		
(12) Female labor force part.	0.51	-0.22	-0.07	-0.19	0.41	0.03	0.05	-0.26	-0.31	-0.12	0.31	1.00	
(13) Unemployment	-0.11	0.09	0.11	0.38	-0.04	-0.09	-0.03	-0.21	-0.04	0.15	-0.31	-0.49	1.00
(14) Manufacturing workforce	-	-	-0.11	-0.30	0.12	0.22	0.16	-0.00	-	-	0.25	0.50	-0.63

Note: Correlations based on period averages.

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Tables and figures

Table 1. Electoral system and the number of years with left and right governments (1945-98)

		Government partisanship		Proportion of right governments
		Left	Right	
Electoral system	Proportional	266 (8)	116 (1)	0.3
	Majoritarian	86 (0)	256 (8)	0.75

Note: Excludes centrist governments and PR cases with single party majority governments.

Table 2. Regression results for reduction in inequality (standard errors in parentheses)

	1	2
Inequality	-16.75*** (5.68)	8.94 (7.87)
<i>Political-institutional variables:</i>		
Partisanship (right)	-	-9.63*** (3.35)
Voter turnout	-	0.00 (0.01)
Unionization	-	0.18** (0.08)
Number of veto points	-	-1.01* (0.58)
Vocational training	-	0.10*** (0.03)
<i>Controls:</i>		
Per capita income	-0.0014*** (0.0005)	-0.0005 (0.0006)
Female labor force participation	0.73*** (0.11)	0.39** (0.18)
Unemployment	0.81*** (0.27)	0.90*** (0.26)
8	.4	.7
<i>Adj. R-squared</i>	0.61	0.73
<i>N</i>	47	47

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

Note: All independent variables are measures of the cumulative effect of these variables between observations on the dependent variable. See regression equation and text for details.

Table 3. Key indicators of party and electoral systems

		Electoral system	Expectation that single party government forms without need for third party support	Effective number of legislative parties	Proportionality of electoral system
majoritarian	Australia	Majority ¹⁾	Yes	2.5	0.19
	Canada	SMP	Yes	2.2	0.13
	France	Run-off ²⁾	Yes	3.8	0.16
	Ireland	STV ³⁾	Ambiguous	2.8	0.70
	Japan	SNTV ⁴⁾	Yes	2.7	0.61
	New Zealand	SMP	Yes	2.0	0.00
	UK	SMP	Yes	2.1	0.16
	USA	SMP	Yes	1.9	0.39
	<i>Average</i>			2.5	0.30
Proportional	Austria	PR	Ambiguous	2.4	0.89
	Belgium	PR	No	5.2	0.86
	Denmark	PR	No	4.4	0.96
	Finland	PR	No	5.1	0.87
	Germany	PR	No	2.6	0.91
	Italy	PR	No	4.0	0.91
	Netherlands	PR	No	4.6	1.00
	Norway	PR	No	3.3	0.76
	Sweden	PR	No	3.3	0.90
	<i>Average</i>			3.9	0.90

Notes: ¹⁾ The use of the single transferable vote in single-member constituencies makes the Australian electoral system a majority rather than plurality system; ²⁾ the two-round run-off system has been in place for most of the postwar period with short interruptions of PR (1945 until early 1950s and 1986-88); ³⁾ The Irish single transferable vote system (STV) is unique. While sometimes classified as a PR system, the low constituency size (five or less) and the strong centripetal incentives for parties in the system makes it similar to a median voter dominated SMP system; ⁴⁾ The single non-transferable voting (SNTV) in Japan (until 1994) deviates from SMP in that more than one candidate is elected from each district, but small district size and non-transferability makes it clearly distinct from PR list systems.

Table 4. Electoral system and the number of years with governments farther to the left or to the right than the legislature (1945-98).

		Government partisanship		Proportion of right governments
		Left	Right	
Electoral system	Proportional	208 [240] (6) [7]	174 [142] (3) [2]	0.46 [0.37]
	Majoritarian	94 (0)	248 (8)	0.73

Note: Excludes centrist governments (with a middle score on the Castles-Mair index) and PR cases with single party majority governments.

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

	(1) Government CoG	(2) Government CoG	(3) Government CoG	(4) Government minus leg- islative CoG	(5) Government minus leg- islative CoG	(6) Government CoG
Constant	0.161*** (0.017)	0.178*** (0.026)	0.140*** (0.018)	0.163*** (0.018)	0.202*** (0.019)	0.092 (0.108)
Lagged dependent variable	0.761*** (0.023)	0.800*** (0.022)	0.801*** (0.022)	0.750*** (0.025)	0.706*** (0.027)	0.742*** (0.027)
Electoral system (PR)	-0.075*** (0.012)	-	-	-0.049*** (0.012)	-0.049*** (0.013)	-0.076*** (0.019)
Effective number of parties (logged)	-	-0.068*** (0.017)	-	-	-	-
Proportionality index	-	-	-0.064*** (0.017)	-	-	-
Fragmentation (left minus right)	-	-	-	-	0.107*** (0.023)	0.087*** (0.029)
Electoral participation	-	-	-	-	-	0.000 (0.001)
Manufacturing workforce	-	-	-	-	-	0.003 (0.002)
Unionization	-	-	-	-	-	-0.000 (0.001)
Income per capita	-	-	-	-	-	-0.000 (0.000)
Female labor force participation	-	-	-	-	-	0.001 (0.001)
Unemployment	-	-	-	-	-	0.004* (0.002)
<i>Adj. R-squared</i>	0.700	0.691	0.691	0.613	0.619	0.700
<i>N</i>	672	717	717	672	664	577

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

Note: Standard errors are panel corrected standard errors.

Figure 1. The indifference curves for L and H and the empty LH win-set of m^* .

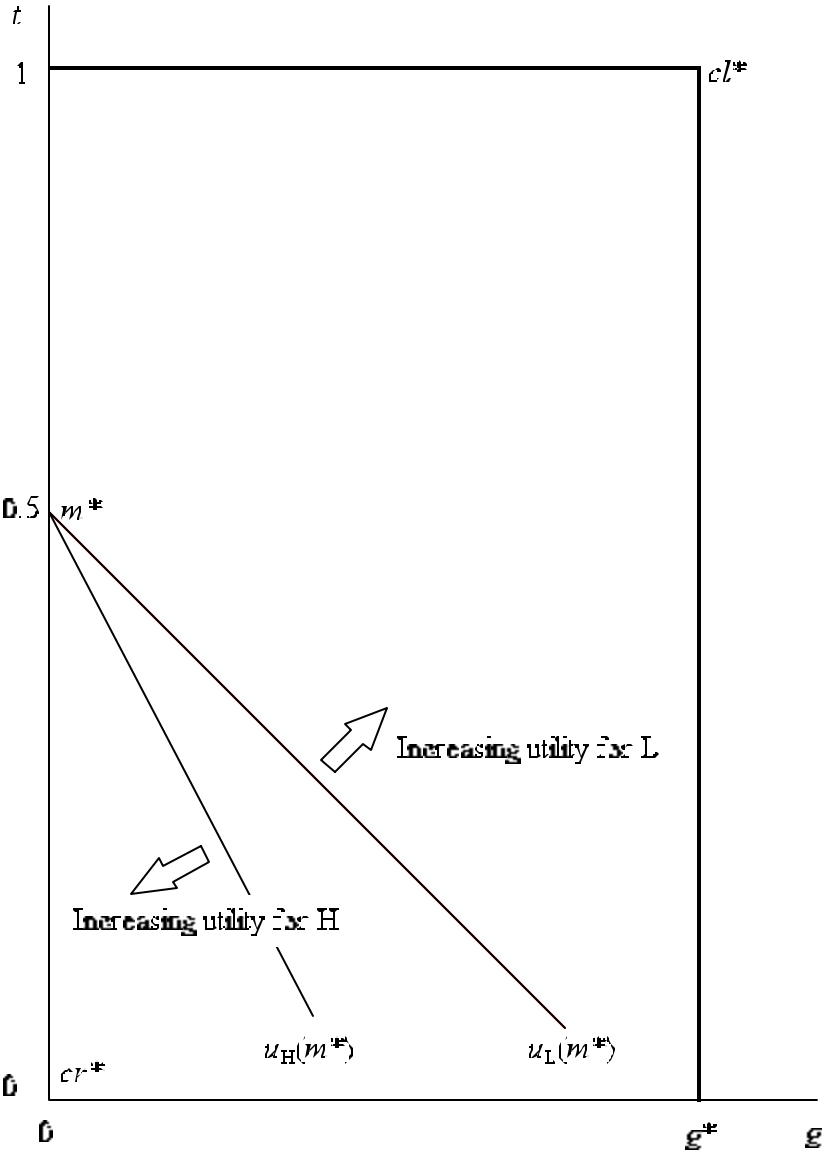


Figure 2. The structure of the coalition game

