

Electoral systems and the politics of coalitions :

Why some democracies redistribute more than others

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Abstract:

We develop a general model of redistribution and use it to account for the remarkable variance in government redistribution across democracies. We show that the electoral system plays a key role because it shapes the composition of governing coalitions, whether these are conceived as electoral alliances between 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 in advanced democracies.

Prepared for presentation at the Juan March Institute, November 2004. A previous version of this paper was presented at the 2002 Annual Meetings of the American Political Science Association, Sheraton and Marriott Hotels, Boston, August 29 - September 2, 2002. We thank Jim Alt, Klaus Armingeon, Neal Beck, David Brady, Geoffrey Brennan, Thomas Cusack, Jeff Frieden, Robert Goodin, Peter Hall, Peter Lange, Peter Katzenstein, Ron Rogowski, Frances Rosenbluth, Fritz Scharpf, Ken Shepsle and Michael Wallerstein for their many helpful comments.

1. Introduction

Redistribution varies notably 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 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.

But the implication that inegalitarian societies redistribute more than egalitarian ones is not well supported by the evidence (see Bénabou 1996; Perotti 1996; Lindert 1996; Alesina, Glaeser, Sacerdote 2001, Moene and Wallerstein 2001). One plausible explanation for this puzzle is that governments affect *both* the pre-fisc distribution of income *and* the redistribution of such income, and that left and right governments produce different combinations. There is covariance by design so to speak. But while there is much evidence to support the idea that “who governs” matters for distributive outcomes (see, for example, Hibbs 1977; Korpi 1983; 1989; Bradley et al. 2003; Boix 1998; Iversen and Wren 1998), this raises another puzzle: why are some countries dominated by left governments while others are dominated by right governments?

Although government partisanship is often assumed reflect the overall level of working class mobilization, we argue that it is in fact mainly determined by differences in coalitional dynamics associated with particular 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 discuss the data (and the one outlier) in detail below.

[Table 1 about here].

Our explanation for association in Table 1 builds on 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). In particular, we argue that the electoral formula affects coalition behavior and leads 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 it is difficult for parties credibly to commit to electoral platforms that deviate from the preferences of their constituents. Furthermore, and key to our results, we allow taxes and transfers to vary across classes, making redistributive politics a multidimensional game. The only constraint is that the rich cannot “soak” the poor under democracy – a condition we borrow from Acemoglu and Robinson’s (2005) work on democracy.

Based on these very general assumptions we show that in a two-party majoritarian system the center-right party is more likely to win government power, and redistribute less, than in a multi-party PR system where the center party is more likely to ally with parties to its left. We test the argument on data for redistribution and government partisanship for advanced democracies in the postwar period.

2. The model

We begin by explaining the assumptions of the model and then prove that these assumptions have two key implications: (i) that center-right governments are more frequent than

center-left governments under majoritarian elections and redistribute less, and (ii) that the obverse holds true for proportional representation (PR).

2.1. Fundamental Assumptions

As in many examples in Persson and Tabellini (1999) and in Acemoglu and Robinson (forthcoming) we assume that individuals are members of one of three “income” groups or classes in society, indexed J . These are L , the low income, M the middle income, and H the high income groups. The voting population is equally divided between the three groups and has a total size of 3; individuals cannot move between different groups.

We adopt a widely used economic model (e.g in Persson, Roland and Tabellini 2003), where the utility of a J member is $U^J = c^J + G(b^J)$, which J maximizes subject to the household budget constraint $c^J = y^J - t^J$ where y^J is the exogenous gross income of J , t^J is a lump-sum tax on J and b^J is government payment (benefit) to J . Since we are solely interested in redistribution in this paper we assume that $G(b^J) = b^J$. Thus J 's indirect utility function is given by $V^J(t^J, b^J) = y^J - t^J + b^J$. For convenience we define $p^J \equiv b^J - t^J$, where p^J is the *net* payment from the government to J . Focusing on the net payment to each group¹, we write J 's indirect utility function as

$$(1) \quad V^J(p^J) = y^J + p^J$$

Evidently

$$(2) \quad y^L < y^M < y^H$$

Next we make the assumption that each group has a maximum taxable capacity (or minimum negative payoff) \bar{t}^J and impose the taxable capacity constraint

¹This has no efficiency implications, see fn 2.

:

$$(3) \quad p^J \geq -\bar{t}^J > -y^J$$

It is correspondingly assumed that

$$(4) \quad 0 = \bar{t}^L < \bar{t}^M < \bar{t}^H$$

Note that no assumption is made about the relation between median and average income – none of our results depend on that relationship. The *budget constraint* on the government is

$$(5) \quad \mathbf{t}^M + \mathbf{t}^H = \sum_J b^J \Rightarrow \sum_J p^J = 0$$

so there is a balanced budget².

Assumptions **(1) to (5)** leave governments free to redistribute income between different classes in society pretty much any way they see fit. But this ignores an important fact about advanced democracies: redistributive policies are with almost no exceptions at least mildly progressive.³ Modelers capture this either by assuming that taxes and transfers always leave the poor better off, as in Esping-Andersen's three worlds of welfare capitalism. Or they assume a tax schedule which produces this result: for example, a proportional income tax and uniform benefit in the case of the Meltzer-Richard model.

The underlying cause of this non-regressivity, we believe, is related to the idea in Acemoglu and Robinson (2005) that democracy is a credible commitment to redistribution. Yet, since they assume that the Meltzer-Richard logic – including majoritarian voting and the median voter theorem together with proportional income tax and uniform benefits – is a good approximation of redistributive democratic politics, they do not consider what happens if taxes and transfers are unrestricted and the poor can be excluded from, or the rich included in,

²So as to simplify the accounting of resources, it is assumed that no resources are needed to collect $\mathbf{t}^J \leq \bar{\mathbf{t}}^J$, but that there is some high cost of setting $\mathbf{t}^J > \bar{\mathbf{t}}^J$ such that it does not pay a government to set $\mathbf{t}^J > \bar{\mathbf{t}}^J$.

³See the data from the Luxemburg Income Study (LIS) that we use below.

government coalitions. The more fundamental reason that the poor and the middle class cannot be made worse off under democracy is, we would argue, twofold: first, democracies normally only come into existence when L and M have built up a sufficient - even if often fragile and transitory - capacity for collective action that it no longer pays H to maintain a dictatorship; and second, we follow Acemoglu and Robinson's fundamental insight that democratic rights solve the time-inconsistency problem of dictatorship, namely that the dictator cannot credibly promise redistribution when lower income groups are temporarily powerful, but we emphasize that those rights (to strike, to organize, etc) confer a permanent capacity for collective action over and above electoral and legislative rights.

Of course, the rich are never powerless to defend their interests, even under democracy. Acemoglu and Robinson stress the potential use of force by the rich to mount or threaten coups. Though this may put an lower bound on how much H can be taxed in a democracy, the threat of coups is not a practical device of distributive politics in advanced democracies. We believe that the ability of H to avoid massive progressive redistribution in these countries is largely due to the ability of the rich to move capital across borders and to devote resources to exploiting means to minimize tax payments. This is reflected in assumption (3) in that the taxable capacity of H , $\bar{\tau}^H$, is below the gross income of H , y^H .

The key for our results, however, is the ability of L and M to use their capacity for collective action under democracy to dissuade the rich from regressive fiscal policies.⁴ Specifically, we assume that a democratic government must leave both L and M better off than under dictatorship, reflecting the greater capacity of the lower classes for collective action in a democracy (again, because a whole range of rights of assembly, collective organization and strikes are embodied in a constitution or a constitutional convention). We assume first that L can use collective action to ensure a positive payoff:

$$(6a) \quad p^L \geq \bar{p}^L > 0$$

⁴ Paradoxically, it is the democratic guarantee of such capacity that makes radical confiscatory policies (revolution) unnecessary.

where \bar{p}^L will vary from country to country depending on the collective action capacity of L in a democracy. In other words, neither an M nor an H dominated government can impose a payoff below \bar{p}^L on L .⁵

The next assumption relates to M 's payoff: here it is assumed that much of M 's capacity for collective action is linked to organizations in which L is important, so that M 's capacity for collective action is undermined when the government is dominated by L . This reflects the historical reality in most democracies that unions and other collective action organizations have recruited some of their members among the middle classes. The implications for our purposes is that an H dominated government will leave M better off than an L dominated government. In particular we assume that

$$(6b) \quad p_H^M > 0 > p_L^M$$

where p_J^M is the net pay to M in an J -controlled government. A similar argument would imply that L is weaker without the support of M (i.e., that $p_H^L > p_M^L$), even though most collective action power is concentrated among the poor. But since this has no implications for our conclusions we can ignore it.

The democratic constraints in **(6a,b)** reflect the historical development of current advanced democracies. Initially democracy was limited to the middle classes, but gradually voting and rights to collective organization were extended to the poor. This benefitted the poor, whereas for the rich democratization was simply a device to fend off something worse (revolution). For the middle class democracy was a two-edged sword: it presented an opportunity to soak the rich, but the expansion of the franchise also contained a risk of being

⁵ We subjoin to **(6a)** the technical assumption that $\bar{t}^M > \bar{p}_L$, absent which - as will be seen - L will sometimes prefer an MH to an LM coalition government under PR.

soaked by the poor.⁶

This is an important tension in our model and clearly evident in the detailed LIS data on redistribution analyzed by Osberg, Smeeding, and Schwabisch (2003). These authors show that while there is wide cross-national variation, the rich everywhere lose, and lose more than any other group, from redistributive taxes and spending.⁷ The poor always gain, and everywhere gain more than other groups. The middle class is in an intermediate position, sometimes gaining and sometimes losing depending on the country and the measure of redistribution (though it never loses as much as the rich or gains as much as the poor). The cross-pressures on the middle class that these findings reflect make the middle class a potential ally of both the poor (for the purpose of soaking the rich) and the rich (for the purpose of avoiding being soaked by the poor). This conception of coalition politics furnishes the key mechanism in our model that we develop in the next section.

2.2. Parties, Elections and government formation

We now introduce electoral competition into the model and distinguish between proportional representation (PR) and majoritarian systems. A basic assumption of our model, and one which affects majoritarian quite differently to PR systems is:

(7) *Platform commitments are not legally binding.* This is a pervasive assumption in the current party literature, and rests on the simple fact that there are no practical devices for leaders to write enforceable contracts with voters (cf. Downs 1957; Persson and Tabellini 1999).

Next, in line with Persson, Roland and Tabellini (2003) and consistent with Duverger's

⁶ Democracy in developing countries may be very different because the collective action power of the poor remain low. If so, the model we develop in the next section would imply that the middle class is relatively more likely to ally with the right in PR systems, and relatively less likely to vote for the right under majoritarian institutions. The results of the model, which run in the opposite direction, would thus be diluted.

⁷ See especially Table 2. Although this table measures net redistribution per child instead of per family member, since low income families tend to have more children, the differences would not be attenuated by counting all in the household.

law – and much empirical evidence that there are more than two parties in PR systems – we assume two parties under majoritarianism and three under PR. Under PR each party, ***L***, ***M*** and ***H*** “represents” its group, *L*, *M* and *H*, respectively (parties are in bold italics). Hence these parties can credibly (though not legally bindingly) commit at an election to pursue the interests of their group in post-election coalition bargaining over policies. ***L,M*** and ***H*** can indeed be thought of as citizen-candidates as in Besley and Coate (1997). Specifically:

(8) Under PR there are three “representative” parties, ***L***, ***M*** and ***H*** (bold italics denote parties as opposed to classes).⁸ Each party represents the relevant class in the sense that the party utility function is the same as that of the group. Thus party ***J*** maximizes V^J , and since $V^J = y^J + p^J$ and y^J is exogenous, ***J*** maximizes p^J for all ***J***. Parties that reflect their constituent preferences will be referred to as *representative parties*. But they can equally be thought of as citizen candidates since party ***J***’s utility is identical to that of citizen ***J***.

With majority voting, the two parties ***LM*** (or center-left) and ***MH*** (or center-right) can be considered coalitions – in the first of *L* and *M*, and in the second of *M* and *H*. This reflects the perceptive observation in Bawn and Rosenbluth (2002) that under PR coalitions are coalitions of parties while under majoritarianism parties are coalitions of groups. In our conception, if coalition parties are representative parties it would mean that bargaining over policies between *L* and *M* takes place if ***LM*** if elected. But, as argued many years ago by Downs (1957), the obvious problem with such parties in a majoritarian system is that they will significantly deviate from the position of the median voter and therefore induce parties to offer more moderate platforms in order to win the election. To achieve this, ***LM*** can opt to be a “leadership” party in which power to choose policies if elected is vested in the party’s leader. If the leader can persuade the

⁸ The three party assumption under PR deviates from Persson and Tabellini (and Meltzer-Richard) who assume two parties. In our view this makes little sense when the empirical literature clearly 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.

electorate that he represents M then LM will beat a representative MH party. We therefore assume that coalition parties in majoritarian systems are typically leadership parties.

Yet, the assumption that platforms of not legally binding means that the leader can never absolutely guarantee to commit to M policies if elected. One potential incentive for party leaders to occasionally deviate from a median voter platform is their need to mobilize the party base in order to maximize voter turnout among prospective supporters. This involves appeals and policy promises to the policy preferences of the party activists, which occasionally have to be honored (Aldrich 1993; 1995, ch. 6; Schlesinger 1984; Kitschelt 1994). We adopt a slightly different and very simple approach to make the argument clearer and to avoid building unnecessarily complicated models - namely the assumption that the type of the candidate is not fully known by voters in advance. Thus it is assumed:

(9) *Under majoritarian voting, there are two “leadership” parties, LM and MH (one is center-left; the other center-right). If a leadership party is elected, its leader chooses the government’s program. The type of the leader of party IJ is not known in advance of the election but either maximizes V^I or V^J . (Thus these parties can also be thought of as *incomplete information citizen candidates*, where the type of the citizen candidate in party IJ is either a candidate maximizing V^I or V^J .) Specifically it is assumed that, prior to the election campaign, the probability that the leader of LM or of MH maximizes V^M is uniformly distributed in the open interval $(.5, 1)$. During the election campaign, voters make a drawing $(\mathbf{p}_{LM}, \mathbf{p}_{MH})$ from $(.5, 1) \times (.5, 1)$, where \mathbf{p}_{LM} and \mathbf{p}_{MH} are the updated probabilities that the leaders of LM and of MH respectively maximize V^M .*

For our purposes the key is simply that parties in a majoritarian system cannot fully commit to

always follow a median voter platform.⁹ Commitment under PR, on the other hand, is not a problem since parties represent groups and voters can work out which coalition will be in power (probabilistically) and which policies which will be adopted. This logic is reflected, we believe, in a widely observed difference in the nature of political competition in multiparty PR and two-party majoritarian systems. In the latter parties are obsessed, to an extent that is not true for parties under PR, with portraying themselves as centrist and their competitor as extremist (as in the recent US presidential election). It is also supported empirically by the systematic tendency for parties to take more extreme positions in PR than in majoritarian systems (Kedar 2002). The greater importance of leaders in majoritarian systems is also supported by empirical evidence (see Curtice, forthcoming).

An issue that is raised by the inability of leadership parties to fully commit to a median voter platform is whether parties in majoritarian systems may be better off transforming themselves into representative parties since it eliminates voter uncertainty. We show in Appendix 1, however, that under reasonable assumptions a “left” representative party under majoritarian rules will always be less attractive to the median voter than a “right” leadership party. This implies that the right party will choose to be a leadership party, and that the left party must become a leadership party itself to be competitive. In other words, representative parties cannot exist in equilibrium under majoritarian rules.

Regarding voters we make the following assumption:

(10) *Voters vote strategically and do not abstain.* Voters anticipate the outcome of the election and vote for the parties that maximize their utility. In our model this leads voters to vote for the party that is also closest to their policy preferences. In that sense voters are also “sincere”. But sincere voting is not an assumption. There is no abstention.

⁹ This is obviously weaker than assuming that they can, and the contrast between majoritarian and PR systems still holds if parties *can* credibly commit, although the differences will be less pronounced.

Finally, we need to specify how governments are formed after the election:

(11) Majoritarian elections. Voters vote with knowledge of \mathbf{p}_{LM} and \mathbf{p}_{MH} . The party with more than 50% of votes becomes the government.

(12) PR Elections. Following the approach in Baron and Ferejohn (1989), coalitions are bargained between two parties, where the party recognized to make the first offer to a party of its choice (the “formateur”) is randomly chosen.¹⁰ After the formateur has been selected, the specific rules of bargaining are:

(i) The formateur, \mathbf{I} , chooses another party, \mathbf{J} , to bargain with over $\mathbf{P}^{IJ} = (p^L, p^M, p^H)$, the program which parties \mathbf{I} and \mathbf{J} will adopt in a coalition government.

(ii) \mathbf{I} and \mathbf{J} bargain over the division of the cake, defined as the maximum taxable capacity of the economy, $\bar{\mathbf{t}}^M + \bar{\mathbf{t}}^H$, less the payoff to L and/or M implied by assumptions **(6a, b)**.

(iii) The bargaining takes the form of a Rubinstein alternating offers game, in which \mathbf{I} makes the first offer; both bargaining parties exhibit equal degrees of impatience and it is assumed that the delay between offers goes to zero.

(iv) In the bargaining game, \mathbf{I} can switch to a bargaining game with \mathbf{K} at any period after \mathbf{I} has rejected an offer of \mathbf{J} . Thus the bargaining game is an outside options game.

2.3. Implications

We now show that assumptions **(1)** through **(12)** imply two key propositions, the first relating to majority rule and the second to PR.

Majoritarian elections.

¹⁰ Random selection makes it as easy as possible for \mathbf{H} to be included in government, and thus harder to reach our conclusion.

Proposition I: Under majoritarian elections, if the ex-ante probability that the **MH** party will

$$\text{win is } \Pi_{MH}, \text{ then } 1 > \Pi_{MH} = 0.5 \left(1 + \frac{\bar{\tau}^M}{\bar{\tau}^M + \bar{\tau}^H - \bar{p}^L} \right) > 0.5.$$

Proof: See Appendix 2.

Proportional representation elections.

Proposition II: The coalition **LM** will be chosen whenever the formateur is either **L** or **M**.

Hence, with random selection of the formateur the ex-ante probability that the **LM** coalition will form government is greater than 0.5.

Proof: The proof has two stages. We show first that, if the bargaining has no outside option (not allowing the formateur to switch to the excluded party), then if **L** or **M** are formateurs they will choose the coalition **LM**. A lemma is then used to show that the outside option makes no difference to this conclusion.

Stage I: Note that the outcome of a Rubinstein alternating offers game without outside options with equal impatience and with the delay between offers going to zero is to split the cake evenly. We consider **M** then **L** as formateur:

(1) **M** is formateur. **M** can choose to bargain with either **L** or **H**. If **M** bargains with **L**, **M** gets

$$V_M^{LM} = .5(\bar{\tau}^H + \bar{\tau}^M) - \bar{\tau}^M = .5(\bar{\tau}^H - \bar{\tau}^M)$$

If **M** bargains with **H**, the cake is reduced by \bar{p}^L , the democratic constraint on **L**'s payoff, so that

$$V_M^{HM} = .5(\bar{\tau}^H + \bar{\tau}^M - \bar{p}^L) - \bar{\tau}^M = .5(\bar{\tau}^H - \bar{\tau}^M - \bar{p}^L)$$

Hence

$$V_M^{LM} > V_M^{MH}$$

(2) L is formateur, and can choose to bargain with M or H . If L bargains with M , L gets

$$V_L^{LM} = .5(\bar{\tau}^H + \bar{\tau}^M)$$

If L bargains with H , the cake is reduced by $\bar{\tau}^M$, since the democratic constraint on M 's payoff if H is in government is 0, so

$$V_L^{LH} = .5\bar{\tau}^H$$

Hence

$$V_L^{LM} > V_L^{LH}$$

This establishes stage 1 of the proof.

Stage 2 follows immediately from the Lemma in Appendix 2.

Summarizing, our model implies that PR is dominated by center-left governments whereas majoritarian systems are dominated by center-right governments. Since left parties on average redistribute more than right parties, this also implies that the electoral system is systematically related to redistribution. The intuition behind the result can be understood as an interaction between the democratic constraints in assumptions (6a) and (6b) and the distinction between leadership and representative parties. Thus, under majoritarian elections the median voter will worry what happens if the “radicals” in each leadership party – L in LM and H in MH – get to set policy once in government. If H sets policy, L and M has the ability to defend their interests by leveraging their joint collective action capacity to restrict regressive policies. Standing alone, M will in a weaker position if L rules, and M therefore has to worry more about the possibility of being soaked by the poor than by the rich. This gives the MH party an electoral advantage. Under PR, the policies of any government will be determined by bargaining between representative

parties, and there is consequently no incomplete contracting problem of the sort that plague majoritarian elections. Since the democratic constraint (6a) stipulates that some of the spending agreed to between M and H has to be shared with L , whereas L and M do not have to share with H , L and M have a common interest in forming a coalition government to “plunder” H .

2.4 From Model to Structural Estimating Equations

The purpose of the paper is to show that electoral systems (E) explain the partisan composition of government (P), and in turn that P explains redistribution (R). We can consider that the basic forms of the structural estimating equations are therefore:

$$(SE.1) \quad P = f(E) \quad \text{with} \quad f' > 0$$

$$(SE.2) \quad R = g(P) \quad \text{with} \quad g' > 0$$

The model of this section assumes there are only two values of electoral system, M and PR . Statistically we have a continuum of observations on the electoral system. Likewise with the partisan variable which in the model just takes the values LM and MH . Thus the model only establishes (SE.1) and (SE.2) for these discrete pairs of values. Propositions I and II established (SE.1) up to $\Pr LM < \Pr MH$ given $E = M$ and $\Pr LM > \Pr MH$ given $E = PR$. (SE.2) is more complicated because of the definition of redistribution. It is straightforward to show from the proofs of Props I and II that if R is measured by p_L , then the switch from an MH to an LM government increases R under both M and PR . However we also want to define redistribution more broadly as as the difference between the Gini coefficients on net and gross income. In Proposition III we show R in this definition is also unambiguously higher with an LM government both under M and PR .

Proposition III: Let $R \equiv G_{net} - G_{gross}$ and $R(P, E)$ be the value of R with government P and electoral system E . Then $R(LM, E) > R(MH, E)$, $E = M, PR$.

Proof: See Appendix 3.

3. The evidence

We test our argument in two parts. In the first we use partisanship and electoral system as explanatory variables to account for differences in the level of redistribution (SE.1). In the second part we use partisanship as the dependent variable, testing the proposition that the electoral system shapes coalition behavior and therefore the composition of governments (SE.2).

3.1. Data

We base our analysis of redistribution on the Luxembourg Income Study (LIS), which has been compiling a significant database on pre- and post-tax and transfer income inequality during the past three decades. 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). All 14 countries have been democracies since the Second World War. 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) 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 higher 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., 2003)¹¹ – 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

¹¹ We are grateful to the authors for letting us use their data.

is adjusted for household size using a standard square root divisor (see OECD 1995).

On the independent side, the key variables for explaining redistribution is government partisanship and electoral system. The first 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), Laver and Hunt (1992), and Huber and Inglehart (1995).

Electoral system is used as an independent variable in both the redistribution and partisanship regressions. 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 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 2. 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 it is not part of the

redistribution regression and the results for partisanship are not sensitive to the particular measure we use or whether Ireland is included or excluded.

[Table 2 about here]

The division into PR and majoritarian system is buttressed by quantitative measures of party and electoral systems. First, countries with majoritarian systems tend have fewer parties than countries with PR systems. This is indicated in the third column of Table 2 using Laasko and Taagepera's (1979) measure of the effective number of parties in parliament.¹² 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 averaged into an index that varies from low proportionality (0) to high proportionality (1). The data are from Lijphart (1994). Note that the proportionality index is consistent with the division into a majoritarian and a proportional group: There are no cases that should be "switched" based on their value on the index.

We also controlled for variables that are commonly assumed to affect redistribution and/or partisanship. These variables, with definitions, sources, as well as a short discussion of causal logic, are listed below. Country means and a correlation matrix are in Appendix 4.

Pre tax and transfer inequality. This variable is included to capture the Meltzer-Richard logic that

¹² 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).

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 Stephens'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 and a stronger left, while simultaneously reducing primary income inequality (see Huber and Stephens 2001 and Bradley et al., 2003). 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 support for the left and 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).

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. Since women tend to be lower paid and more likely to head single-parent households, demand for economic independence that is linked to labor market participation may also lead to greater support for the left and redistributive policies. 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 for estimating (SE.1) is a simple error correction model. In this model, current redistribution, $R_{i,t}$, is equal to past redistribution plus a contribution from redistributive partisan policies, $P_{i,t}$ (and potentially other factors), that deviate from policies that would preserve the status quo level of redistribution:

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

where \mathbf{I} is speed with which redistribution changes in response to changes in policy, and 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:

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

or

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

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 (s is the lag in years). 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 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 λ that maximizes the explained variance.

Given our assumptions the composite errors are serially uncorrelated¹³, 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 (**SE.2**) 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 below.

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 3). 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, however, 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 Meltzer-Richard model expectation. 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 3 about here]

Yet the effect of inequality *reverses* (though the positive effect is not significant) when we include controls for the political-institutional variables (columns 2-4). One likely reasons for this

$$^{13} E \left(\sum_{s=1}^{N_1} \left[(1-I)^s u_{i,t-s} \right] \cdot \sum_{s=1}^{N_2} \left[(1-I)^s u_{i,t-(N_1+1)-s} \right] \right) = 0$$

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 $u_{i,t-(N_1+1)-N_2}$

change is that left governments, as well as strong unions and PR, not only cause an increase in 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.

Three of the political-institutional variables have statistically significant effects on redistribution: partisanship, veto points, and electoral system (using either measure). Right governments redistribute less than left ones, multiple veto points reduce redistribution, while PR is associated with more redistribution. All effects are substantively large. Thus, a one standard deviation change in either one accounts for between one quarter and one third of a standard deviation change in redistribution. The results for partisanship and veto points are essentially confirmation of previous research, especially by Bradley et al. (2003).

The direct effect of electoral system is more intriguing. Our model does not make any clear-cut predictions about this effect, although it does suggest how it may be explained. The first thing to note is that the center-left party can only win in majoritarian systems when the leader is committed to a centrist platform, whereas center-left governments under PR are always to the left of center. Under center-right governments, whatever the electoral system, the payoff to the poor is always be limited to the minimum payoff implied by the democratic constraint. So redistribution to the poor will always be greater under PR, holding partisanship constant. This effect, however, may be attenuated by the middle class doing better under center-right governments in majoritarian systems (which also reduces the gini). Whether this is the case depends on the extent to which the right under PR can credibly to commit to a more moderate platform in order to reduce the electoral advantage of the left. One way it may to do so would be through a broad representative party that includes members of the middle class and the poor. To form such a party would require the ability to appeal to lower income groups on grounds other than class. Religion is one obvious candidate, and Christian democratic parties in Europe do in fact tend to be centrist even as they appeal to higher income class interests. *If* the right under PR is relatively moderate and the same is true for the left under majoritarian systems (which is implied by our model) then we would observe a direct effect of the electoral system. We think this is a potentially fruitful

area for future research.¹⁴

To check the robustness of our findings 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. Note that for this measure the model unambiguously predicts PR to have an additional direct effect because center-left governments always redistribute more to the poor under PR than under majoritarian systems, whereas center-right governments in both systems operate under the same democratic constraint. The results by and large confirm those in Table 3. The effects of partisanship, veto points, and electoral system are slightly *larger* than before (and all significant at a .01 level). However, there is now a positive and statistically significant effect of turnout, while some of the negative effect of inequality remains after inclusion of all controls (though this effect is not significant). While the impact of the key political-institutional variables on redistribution are thus clear, one must be cautious in drawing conclusions about the effects of the other variables.

3.3.2. Partisanship. While both government partisanship and electoral system are important in explaining redistribution, partisanship itself is shaped by the distinct coalitional politics associated with different 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 majoritarian institutions. Although the electoral system has a direct effect on redistribution, we argue that partisanship is one of the key mechanisms through which it exerts an effect on redistribution. To our knowledge this idea has never before been proposed or tested.

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

¹⁴ Some recent work by Roemer (1998) and Austen-Smith and Wallerstein (2003) also explores the effect of non-economic issues on the politics of redistribution.

coalition politics from having any influence on the composition of the government. We therefore exclude this case from the analysis, although every result reported in this section goes through with Switzerland included.¹⁵

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 majoritarian rules.¹⁶ We also excluded all observations from PR systems with single-party majority governments. There were 40 annual observations with such governments, 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. However, 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 under PR 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 years with center-right governments and only 16 years with 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

¹⁵ Because right parties cannot be excluded from government power in Switzerland, we should expect redistribution to be lower than in other PR countries. This is empirically the case since the average pre to post-tax and transfer reduction in the gini is 9 percent in Switzerland whereas it is 28 percent in other PR countries

¹⁶ 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 (i.e., they must have a score of 3 on the Castles-Mair scale).

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 noted above 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). Note, however, that in our theoretical model 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 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 did try 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 1994 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 allies outside the

center, they turned to small parties slightly to the left of center (PSI and PSDI). Since the DC contains the median MP, these governments were to the left of the legislative median. 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 pulls the legislative CoG quite far to the left.

The 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 (and hence the median legislator's) 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.

[Table 5 about here]

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 a discontinuous rather than a continuous variable.

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 government, or between the latter and a typical conservative government. Another way to convey the finding 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.¹⁷

The final test uses 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 coalitional dynamics and the 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

¹⁷ This would seem to imply that fractionalization is not an important determinant of electoral system – a point argued in Cusack et al (2004).

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 ($r=-.78$). The historical strength and unity of the union movement may have affected the choice of electoral system and clearly influences the divisiveness of the political left, and hence its likelihood of governing. Needless to say, these are issues that require 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

The details of actual tax and spend policies for the purpose of redistribution are complex, but the explanation for redistribution in advanced democracies is probably 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 very general model that explains the electoral system 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 is closer to the distributive interests of the center-right party, any probability that parties will defect from a median voter platform once elected will make the median voter more likely to vote for the center-right.

This result contrasts to multiparty PR systems where governments are based on coalitions

of class parties. In this context, center parties will tend to find it in their own interest to ally with parties to the left. This result follows because the middle class can use taxation of the rich to bargain a tax rate and benefit level with the poor that is closer to its own preference. There is no opportunity for a coalition of the center and right to exploit the poor in the same manner.

We have shown that these propositions are supported by data for redistribution. To our knowledge it is only the second paper documenting the association between electoral system and government partisanship (the other, written at the same time for same purpose is Powell 2002). It is the first that provides a systematic explanation. The findings raise several questions for further research. First, the model may have very different implications for developing democracies if the poor has no collective action capacity or the rich can threaten coups in such countries. Specifically, if the poor can be ignored when they are not participating in government, and this raises the likelihood of center-right governments under PR. Likewise, if the rich can threaten coups, it can give the middle class an incentive to support a center-left party under majoritarian institutions since if the rich prevails in a center-right party there is nothing that prevents it from exploiting the middle class (and the poor). It also seems plausible that better measures of differences in the collective action capacity of the poor will explain some of the residual variance in redistribution for rich democracies.

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; Iversen forthcoming). 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 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 to be the only viable alternative (Rogowski and MacRay 2004). Our model and evidence suggest that forward-looking politicians from the right have a class interest in choosing majoritarian institutions. The poor, on the other hand, always have an interest in PR unless they expect to be a majority. Only if right parties have specialized interests that prevent effective coordination are countries therefore likely to end up with PR institutions.

Appendix 1:

Leadership parties dominate representative parties in majoritarian systems

We sketch out in this appendix why we make the assumption that there are two leadership parties in majoritarian elections. (It is not meant as a formal proof as that would require assumptions on the conditions under which different types of parties can be formed.)

If a representative party, a ρ party for convenience, represents more than one group, as in a majoritarian system, policy decisions in government are arrived at by Rubinstein consensus bargaining between the two groups involved. If, under majoritarian rule, **LM** and **MH** are ρ parties, their chosen policies if elected will be respectively to the left and to the right of the median voter's ideal point. Both **LM** and **MH** might wish to commit during the election to policies closer to M's position, but they cannot since policies will be bargained out between the two groups the party represents if it is in power. Note that elections have no informational importance since voters know what policies a ρ party will carry out if in government.

In a leadership party, a λ party for convenience, (say **LM**), the leader has complete powers to choose policies if elected, but voters are unsure whether the leader represents M or L. Before the election voters know only that the probability that the leader in either party represents M is in the open interval (0.5,1). This assumes that each party is equally good at picking M leaders on average. The election period provides information which enable voters to update their probabilities: let p_{LM} and σ be the updated probabilities that the **LM** leader and the **MH** leader are seen by the electorate as representing M.

We now show that if both parties are ρ parties, **LM** will always win, which implies that **MH** will switch to becoming a λ party, since it will then sometimes win. But if **MH** is a λ party, it will always beat an **LM** ρ party. Only leadership parties are therefore sustainable in equilibrium.

(i) Assume both parties are ρ parties (**LM**- ρ , **MH**- ρ). Then, if **LM**- ρ is elected the payoff to M is

$$\frac{1}{2}(\bar{t}^H - \bar{t}^M),$$

the result of Rubinstein bargaining between the L and M factions after the

election. If **MH**- ρ is elected, M's payoff is $\frac{1}{2}(\bar{\tau}^H - \bar{p}^L - \bar{\tau}^M)$. Hence M will always vote for

LM- ρ , so that:

Proposition A.1 Given (**LM**- ρ , **MH**- ρ), **LM**- ρ wins with probability 1.

Thus (**LM**- ρ , **MH**- ρ) is not an equilibrium and **MH** will switch to a λ party since, given **LM**- ρ , it will have some positive probability of winning – whenever p_{MH} , the probability of the **MH**- λ leader being an M-type, is close enough to 1.

(ii) Now assume ((**LM**- ρ , **MH**- λ). As in (i), if **LM**- ρ is elected the payoff to M is

$0.5 \cdot (\bar{\tau}^H - \bar{\tau}^M)$. The probability that the **MH**- λ leader is an M-type $p_{LM} \in (0.5, 1)$, so the

minimum payoff to M from electing **MH**- λ is greater than $0.5 \cdot (\bar{\tau}^H - \bar{p}^L)$. Since by

assumption $\bar{\tau}^M > \bar{p}^L$, this implies the following proposition:

Proposition A.2: Given (**LM**- ρ , **MH**- λ), **LM**- ρ has a zero probability of winning.

[Note also that the payoff to M from **LM**- λ , $p_{LM}(\bar{\tau}^H - \bar{p}^L) - (1 - p_{LM})\bar{\tau}^M$, is always greater

than that from **MH**- ρ , $\frac{1}{2}(\bar{\tau}^H - \bar{\tau}^M - \bar{p}^L)$, since $p_{LM} > 0.5$]

Appendix 2

The probabilities of partisan governments under different electoral systems

(1) *MH* probability of winning in majoritarian elections.

Proposition I: *Under majoritarian elections, the ex-ante probability that the MH party will win is*

$$\Pi_{MH} = 0.5 \left(1 + \frac{\bar{\tau}^M}{\bar{\tau}^M + \bar{\tau}^H - \bar{p}_L} \right) > 0.5.$$

Proof: (i) *L* votes *LM* iff $\mathbf{p}_{LM} \bar{p}_L + (1 - \bar{\mathbf{p}}_{LM})(\bar{\tau}^H + \bar{\tau}^M) \geq \bar{p}_L$. Since $(\bar{\tau}^H + \bar{\tau}^M) > \bar{p}_L$, this is always true. (ii) *H* votes *MH* iff $-\mathbf{p}_{MH} \bar{\tau}^H - (1 - \mathbf{p}_{MH}) \bar{p}_L > -\bar{\tau}^H$. Since $-\bar{p}_L > -\bar{\tau}^H$ this is always true. (i) and (ii) imply that *MH* wins iff *M* votes *MH*. Therefore Π_{MH} is the same as the probability that *M* votes *MH*.

M votes *MH* iff $\mathbf{p}_{MH}(\bar{\tau}^H - \bar{p}_L) > \mathbf{p}_{LM}(\bar{\tau}^H - \bar{p}_L) - (1 - \mathbf{p}_{LM})\bar{\tau}^M$. Thus

$$\Pi_{MH} = \Pr \left[\mathbf{p}_{MH}(\bar{\tau}^H - \bar{p}_L) > \mathbf{p}_{LM}(\bar{\tau}^H - \bar{p}_L) - (1 - \mathbf{p}_{LM})\bar{\tau}^M \right]$$

where \mathbf{p}_{MH} and \mathbf{p}_{LM} are independently uniformly distributed on $(0.5, 1)$. Let F_X be the

distribution function of X and f_X its probability function and defining : $\mathbf{b} \equiv \frac{\bar{\tau}^M}{\bar{\tau}^H - \bar{p}_L}$ Then:

$$\Pi_{MH} = \Pr \left[\mathbf{p}_{MH} > \mathbf{p}_{LM}(1 + \mathbf{b}) - \mathbf{b} \right]$$

$$= \Pr \left[\mathbf{p}_{MH} > \mathbf{p}_{LM}(1 + \mathbf{b}) - \mathbf{b} \mid \mathbf{p}_{LM}(1 + \mathbf{b}) - \mathbf{b} \geq 0.5 \right] + \Pr \left[\mathbf{p}_{LM}(1 + \mathbf{b}) - \mathbf{b} < 0.5 \right]$$

$$= \int_{\mathbf{p}_{LM} = \frac{.5 + \mathbf{b}}{1 + \mathbf{b}}}^1 \left(1 - F_{\mathbf{p}_{MH}}(\mathbf{p}_{LM}(1 + \mathbf{b}) + \mathbf{b}) \right) f_{\mathbf{p}_{LM}}(\mathbf{p}_{LM}) d\mathbf{p}_{LM} + F_{LM} \left(\frac{.5 + \mathbf{b}}{1 + \mathbf{b}} \right)$$

$$\begin{aligned}
&= \int_{p_{LM} = \frac{.5+b}{1+b}}^1 \frac{1 - p_{LM}(1+b) + b}{0.5^2} dy + 2 \left(\frac{.5+b}{1+b} - .5 \right) \\
&= 4(1+b) \left[1 - \frac{.5+b}{1+b} \right] - 4(1+b) \left[\frac{1}{2} - \frac{1}{2} \left(\frac{.5+b}{1+b} \right)^2 \right] + \frac{b}{1+b} \\
&= \frac{0.5}{1+b} + \frac{b}{1+b} = 0.5 \left(1 + \frac{b}{1+b} \right) = 0.5 \left(1 + \frac{\bar{t}^M / (\bar{t}^H - \bar{p}_L)}{1 + \bar{t}^M / (\bar{t}^H - \bar{p}_L)} \right) = 0.5 \left(1 + \frac{\bar{t}^M}{\bar{t}^M + (\bar{t}^H - \bar{p}_L)} \right) > 0.5
\end{aligned}$$

(the intuition of the first term is that $\frac{b}{1+b}$ is the probability that $p_{LM}(1+b) - b < .5$ where M certainly votes MH and there is a .5 probability that M votes MH when $p_{LM}(1+b) - b \geq .5$ which occurs with probability $1/1+b$). ■

(2) The switching game in coalition bargaining.

Let $U_I(\mathbf{s}_I^J)$ be the utility party I gets from J 's acceptance of I 's offer of \mathbf{s}_I^J . We first define the Rubinstein unique SGPE in the bargaining games in which there is no outside or switching option. In the LM game we have

$$\begin{aligned}
(1) \quad &U_L(\bar{\mathbf{s}}_M^L) = dU_L(\bar{\mathbf{s}}_L^M) \\
&U_M(\bar{\mathbf{s}}_L^M) = dU_M(\bar{\mathbf{s}}_M^L)
\end{aligned}$$

Note that M 's initial offer to L is $\bar{\mathbf{s}}_M^L$, and this is accepted by L ; thus the value of opening bargaining with L is $U_M(\bar{\mathbf{s}}_M^L)$.

In the HM game

$$\begin{aligned}
(2) \quad &U_H(\bar{\mathbf{s}}_M^H) = dU_H(\bar{\mathbf{s}}_H^M) \\
&U_M(\bar{\mathbf{s}}_H^M) = dU_M(\bar{\mathbf{s}}_M^H)
\end{aligned}$$

We assume

$$(3) \quad U_M(\bar{\mathbf{s}}_M^L) > U_M(\bar{\mathbf{s}}_M^H)$$

i.e. that in bargaining without switching options M 's payoff from bargaining with L is greater than M 's payoff from bargaining with H .

The “outside option principle” (see, e.g. Osborne and Rubinstein [1994], 7.4.3, p 128) states that if the value to M of switching to bargaining with say H after rejecting an offer of L is \bar{U}_M^{MH} , then (i) if $\bar{U}_M^{MH} > U_M(\bar{s}_M^L)$ L 's SGPE offer to M is $d\bar{U}_M^{MH}$ and (ii) if $\bar{U}_M^{MH} < U_M(\bar{s}_M^L)$ this has no effect on the LM game and L continues to offer $U_M(\bar{s}_M^M) = dU_M(\bar{s}_M^L)$. Let us call case (i) the case of a “binding” outside option and (ii) a “non-binding” outside option.

If there is a binding outside option in the LM game, M 's SGP offer to L , is given by the solution of

$$\begin{aligned} U_L(\tilde{s}_M^L) &= dU_L(\tilde{s}_L^M) \\ U_M(\tilde{s}_L^M) &= d\bar{U}_M^{MH} \end{aligned}$$

If there is a binding outside option in the HM game, M 's SGP offer to H , \tilde{s}_M^H , is given by the solution of

$$\begin{aligned} U_H(\tilde{s}_M^H) &= dU_H(\tilde{s}_H^M) \\ U_M(\tilde{s}_H^M) &= d\bar{U}_M^{ML} \end{aligned}$$

Lemma 1. In the Switching Game, if $U_M(\bar{s}_M^L) > U_M(\bar{s}_M^H)$ then \bar{U}_M^{ML} is binding on the MH game and \bar{U}_M^{MH} is not binding on the ML game.

Proof: There are two steps: (1) Assume, per contra, that \bar{U}_M^{ML} is non-binding on the MH game and \bar{U}_M^{MH} is binding on the ML game: then $\bar{U}_M^{MH} = U_M(\bar{s}_M^H) > U_M(\bar{s}_M^L)$. But this implies $U_M(\bar{s}_M^L) < U_M(\bar{s}_M^H)$ which contradicts (1.3) $U_M(\bar{s}_M^L) > U_M(\bar{s}_M^H)$. (2) Alternatively assume, per contra, that \bar{U}_M^{ML} is binding on the MH game and \bar{U}_M^{MH} is binding on the ML . In that case, $\bar{U}_M^{ML} = U_M(\tilde{s}_M^L)$, since that is the SGP offer which M makes to L at the start of an LM game, and $\bar{U}_M^{MH} = U_M(\tilde{s}_M^H)$ for the MH game. We also have in the LM game $U_M(\tilde{s}_L^M) = d\bar{U}_M^{MH} = dU_M(\tilde{s}_M^H) \geq dU_M(\tilde{s}_M^L)$, because if $U_M(\tilde{s}_M^H) < U_M(\tilde{s}_M^L)$ it would not pay M to switch from to the MH game. Likewise in the MH game $U_M(\tilde{s}_M^L) \geq U_M(\tilde{s}_M^H)$. Clearly $U_M(\tilde{s}_M^H) \geq U_M(\tilde{s}_M^L) \& U_M(\tilde{s}_M^L) \geq U_M(\tilde{s}_M^H)$ imply $U_M(\tilde{s}_M^H) = U_M(\tilde{s}_M^L)$. From the definition of the solution of the binding outside option LM game this implies

$$\begin{aligned} U_L(\tilde{s}_M^L) &= dU_L(\tilde{s}_L^M) \\ U_M(\tilde{s}_L^M) &= d\bar{U}_M^{MH} = dU_M(\tilde{s}_M^L) \end{aligned}$$

which as can be seen by comparing the solution for the non-binding game implies $\tilde{\mathbf{s}}_M^L = \bar{\mathbf{s}}_M^L$.

Analogously for the **MH** game $\tilde{\mathbf{s}}_M^H = \bar{\mathbf{s}}_M^H$. Hence $U_M(\tilde{\mathbf{s}}_M^H) = U_M(\tilde{\mathbf{s}}_M^L)$ implies that

$U_M(\bar{\mathbf{s}}_M^H) = U_M(\bar{\mathbf{s}}_M^L)$, but this contradicts the assumption that $U_M(\bar{\mathbf{s}}_M^H) < U_M(\bar{\mathbf{s}}_M^L)$. Thus both games cannot simultaneously have binding outside options. This establishes the lemma.

With aid of this proposition we can now prove the main result that **M** will choose at the start of the switching game to bargain with **L**, and will offer **L** $\bar{\mathbf{s}}_M^L$ which **L** will accept.

Lemma 2. In the Switching Game, if $U_M(\bar{\mathbf{s}}_M^L) > U_M(\bar{\mathbf{s}}_M^H)$, **M** will choose the **LM** game initially, will offer **L** $\bar{\mathbf{s}}_M^L$ and **L** will accept.

Proof: From Lemma 1, the **LM** game will be non-binding and the **MH** game will have a binding outside option. Hence at the start of any **LM** game **M** will offer $\bar{\mathbf{s}}_M^L$ which **L** will accept, yielding $U_M(\bar{\mathbf{s}}_M^L)$ to **M**; this implies the **MH** game will have the binding outside option $\bar{U}_M^{ML} = U_M(\bar{\mathbf{s}}_M^L)$. At the start of any **MH** game **M** offers $\tilde{\mathbf{s}}_M^H$ to **H** and **H** accepts this, yielding **M** the payoff $U_M(\tilde{\mathbf{s}}_M^L)$, where $\tilde{\mathbf{s}}_M^H$ is the solution of

$$(4) \quad \begin{aligned} U_H(\tilde{\mathbf{s}}_M^H) &= dU_H(\tilde{\mathbf{s}}_H^M) \\ U_M(\tilde{\mathbf{s}}_H^M) &= d\bar{U}_M^{ML} = dU_M(\bar{\mathbf{s}}_M^L) \end{aligned}$$

To establish the proposition we need to show that $U_M(\tilde{\mathbf{s}}_M^H) < U_M(\bar{\mathbf{s}}_M^L)$, since then it will pay **M** to start bargaining with **L** rather than **H**.

We show first that $U_M(\tilde{\mathbf{s}}_M^H) \neq U_M(\bar{\mathbf{s}}_M^L)$, then that $U_M(\tilde{\mathbf{s}}_M^H) \leq U_M(\bar{\mathbf{s}}_M^L)$. (i) $U_M(\tilde{\mathbf{s}}_M^H) = U_M(\bar{\mathbf{s}}_M^L)$ implies $\tilde{\mathbf{s}}_M^H = \bar{\mathbf{s}}_M^L$, hence from (4) above

$$\begin{aligned} U_H(\tilde{\mathbf{s}}_M^H) &= dU_H(\tilde{\mathbf{s}}_H^M) \\ U_M(\tilde{\mathbf{s}}_H^M) &= dU_M(\bar{\mathbf{s}}_M^L) = dU_M(\tilde{\mathbf{s}}_M^H) \end{aligned}$$

But this implies that $\bar{\mathbf{s}}_M^H = \bar{\mathbf{s}}_M^L$, so $U_M(\bar{\mathbf{s}}_M^H) = U_M(\bar{\mathbf{s}}_M^L)$ contradicting $U_M(\bar{\mathbf{s}}_M^H) < U_M(\bar{\mathbf{s}}_M^L)$. (ii)

Since $U_M(\tilde{\mathbf{s}}_M^H) = \bar{U}_M^{HM}$, if $U_M(\tilde{\mathbf{s}}_M^H) > U_M(\bar{\mathbf{s}}_M^L)$, then $\bar{U}_M^{HM} > U_M(\bar{\mathbf{s}}_M^L)$ implying that the **LM** game has a binding constraint, thus contradicting Proposition 1. Thus $U_M(\tilde{\mathbf{s}}_M^H) < U_M(\bar{\mathbf{s}}_M^L)$, establishing the proposition.

Proposition 2 states that $U_M(\tilde{\mathbf{s}}_M^H) < U_M(\bar{\mathbf{s}}_M^L)$. It may be of interest to show that

$U_M(\tilde{\mathbf{s}}_M^H) > U_M(\bar{\mathbf{s}}_M^H)$ and this we do in the following corollary.

Corollary: $U_M(\tilde{\mathbf{s}}_M^H) > U_M(\bar{\mathbf{s}}_M^H)$.

Proof: From (2) and (4)

$$(5) \quad \begin{aligned} U_H(\tilde{\mathbf{s}}_M^H) - U_H(\bar{\mathbf{s}}_M^H) &= \mathbf{d}[U_H(\tilde{\mathbf{s}}_H^M) - U_H(\bar{\mathbf{s}}_H^M)] \\ U_M(\tilde{\mathbf{s}}_H^M) - U_M(\bar{\mathbf{s}}_H^M) &= \mathbf{d}[U_M(\bar{\mathbf{s}}_M^L) - U_M(\bar{\mathbf{s}}_M^H)] \end{aligned}$$

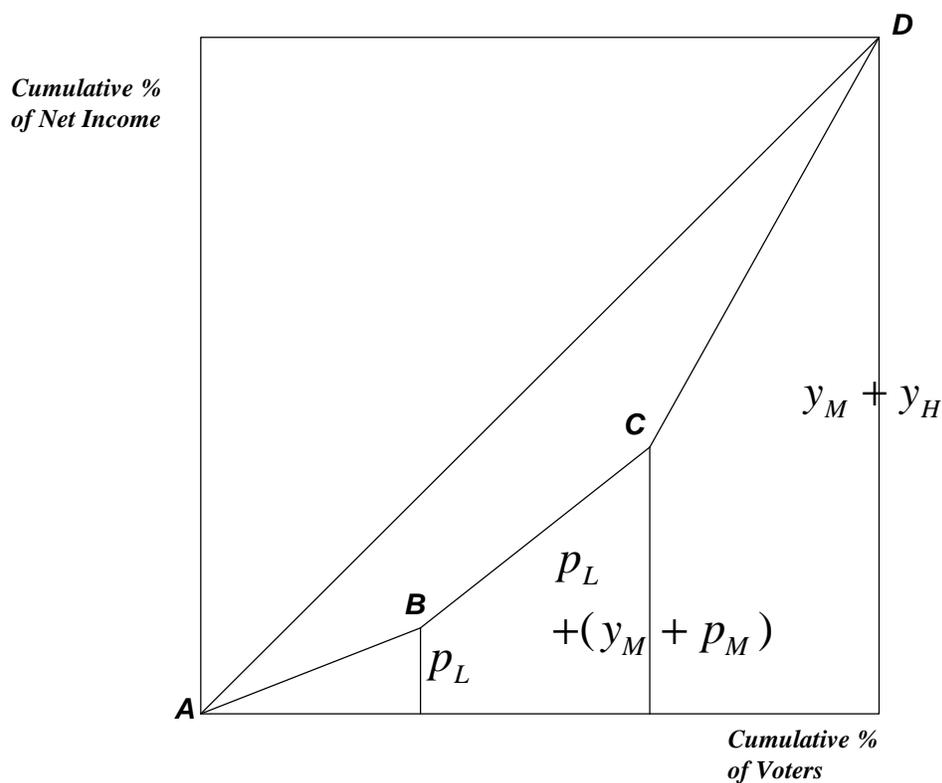
From the second line of (5) the RHS is positive so that $U_M(\tilde{\mathbf{s}}_H^M) > U_M(\bar{\mathbf{s}}_H^M)$. This implies that $U_H(\tilde{\mathbf{s}}_H^M) < U_H(\bar{\mathbf{s}}_H^M)$ and hence that $U_H(\tilde{\mathbf{s}}_M^H) < U_H(\bar{\mathbf{s}}_M^H)$. In turn this implies the corollary.

Appendix 3

The effect of partisanship on redistribution

In this Appendix we prove Proposition III, that given the electoral system a move from an *MH* government to an *LM* government increases redistribution where redistribution is defined as the difference between Gini coefficients of net and gross income.

Proposition III Let $R \equiv G_{Net} - G_{Gross}$ and $R(P, E)$ be the value of R with government P and electoral system E . Then



The Gini coefficient is the ratio of the area under ABCD to half the square. Perfect equality is when ABCD coincides with AD. We will assume that $\sum_{I=L,M,H} y_I = 1$ in what follows.

It can be seen that the area under ABCD is equal to

$$G_{Net} = \left(\begin{array}{l} p_L/3 + p_L/6 + (y_M + p_M)/6 \\ + (p_L + y_M + p_M)/3 + (p_H + y_H)/6 \end{array} \right) / 0.5$$

(Remember that $\sum_I p_I \equiv 0$.)

We also have

$$G_{Gross} \equiv (y_M/6 + y_M/3 + y_H/6) / 0.5$$

So redistribution is defined by

$$R \equiv G_{Net} - G_{Gross} = 2 \cdot (2p_L/3 + p_M/3) \propto 2p_L + p_M$$

From the model we can at once write:

$$R(LM, PR) = \bar{\mathbf{t}}^H$$

since $p_M = 0.5(\bar{\mathbf{t}}^H - \bar{\mathbf{t}}^M)$ and $p_L = 0.5(\bar{\mathbf{t}}^H + \bar{\mathbf{t}}^M) = 0.5\bar{\mathbf{t}}$, etc, and

$$R(MH, PR) = 0.5(\bar{\mathbf{t}}^H - \bar{\mathbf{t}}^M - \bar{p}_L) + 2\bar{p}_L = 0.5\bar{\mathbf{t}}^H + \bar{p}_L - 0.5(\bar{\mathbf{t}}^M - \bar{p}_L).$$

Since $\bar{p}_L < \bar{\mathbf{t}}^M < \bar{\mathbf{t}}^H$, $R(LM, PR) > R(MH, PR)$. This establishes the first part of Prop III.

In the majoritarian case

$$\begin{aligned} R(LM, M) &= (\bar{p}_{LM}(\bar{\mathbf{t}}^H - \bar{p}_L) - (1 - \bar{p}_{LM})\bar{\mathbf{t}}^M) \\ &+ 2((\bar{p}_{LM}\bar{p}_L) + (1 - \bar{p}_{LM})\bar{\mathbf{t}}) \end{aligned}$$

where

$$\bar{p}_{LM} = \left[1 + \frac{0.5 + \mathbf{b}}{1 + \mathbf{b}} \right] / 2$$

Since $\bar{p}_{LM} < 1$, $\min_{\bar{p}_{LM}} R(LM, M) > (\bar{\mathbf{t}}^H - \bar{p}_L) + 2\bar{p}_L > \max_{\bar{p}_{MH}} R(MH, M)$ since

$$R(MH, M) = \bar{p}_{MH}(\bar{\mathbf{t}}^H - \bar{p}_L) + 2\bar{p}_L. \text{ This establishes the second part of Prop III.}$$

Appendix 4: Summary Statistics

Country means for variables used in regression analysis

	Redistribution	Inequality (wages)	Partisanship	Voter turnout	Unionization	Veto points	Vocational training	Electoral system	Effective number of parties	Fragmentation	Per capita income	Female labor force participation	Unemployment	Manufacturing workforce
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	-0.6	-0.46	0.52	0.23	0.79	-0.83	-	-0.29	1			
(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

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

	(1)	(2)	(3)	(4)
Inequality	-16.75*** (5.68)	13.80 (9.89)	13.53 (9.89)	13.48 (8.86)
<i>Political-institutional variables:</i>				
Partisanship (right)	-	-11.35*** (4.08)	-11.22*** (4.09)	-12.14*** (4.16)
Voter turnout	-	-0.00 (0.01)	-0.00 (0.01)	-0.01 (0.01)
Unionization	-	0.17 (0.13)	0.17 (0.13)	0.17 (0.12)
Number of veto points	-	-1.68** (0.67)	-1.65** (0.67)	-1.89*** (0.71)
Electoral system (PR)	-	5.13** (2.01)	-	-
Effective number of parties (logged)	-	-	5.11** (2.05)	-
Proportionality index	-	-	-	7.62*** (2.76)
<i>Controls:</i>				
Per capita income	-0.0014*** (0.0005)	-0.0005 (0.0008)	-0.0005 (0.0008)	-0.0005 (0.0008)
Female labor force participation	0.73*** (0.11)	0.34 (0.26)	0.34 (0.26)	0.33 (0.26)
Unemployment	0.81*** (0.27)	0.98*** (0.20)	0.98*** (0.20)	1.03*** (0.22)
λ	.4	.7	.7	.7
<i>Adj. R-squared</i>	0.61	0.75	0.74	0.76
<i>N</i>	47	47	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 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)	(2)	(3)	(4)	(5)	(6)
	Government CoG	Government CoG	Government CoG	Government minus leg- islative CoG	Government minus leg- islative CoG	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 (0.000)
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>	0.70	0.69	0.69	0.61	0.62	0.70
<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.