The Electoral Foundations of Redistributive Politics

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Abstract

What are the implications of electoral geography – the joint geographic distribution of voters and legislative seats across districts – for social policy? In a series of formal analytic examples, I demonstrate the important role of electoral geography in determining social policy and find that under some conditions, single member plurality systems may yield redistributive policy that is at least as progressive as the policy that would be implemented under proportional representation rules – an outcome that directly challenges the existing literature. This discussion then evaluates empirically the implications of electoral geography for redistributive politics in a broadly comparative analysis of contemporary democratic societies. In countries where electoral geography favors the representation of low-income citizens, we observe greater overall reductions in income inequality through redistribution, and higher levels of social spending.

1 Introduction

What are the implications of electoral geography – the joint geographic distribution of voters and legislative seats across districts – for social policy? This paper is motivated by two stylized facts that are neglected by the current political economic analysis of the relationship between electoral rules and social policy: First, the geographic distribution of income varies across countries. Second, electoral rules moderate the representation of geographically concentrated groups. Previous analysis of the effects of electoral rules on social policy assume either fully integrated populations or populations that are perfectly segregated across electoral districts, and find that proportional representation rules contribute to more broadly redistributive policies than single member district electoral rules. In the series of formal analytic examples that follow, however, I demonstrate the important role of electoral geography in determining social policy and find that under some conditions, single member plurality systems may yield redistributive policy that is at least as progressive as the policy that would be implemented under proportional representation rules – an outcome that directly challenges the existing literature.

In the discussion that follows, I build on a standard group-based model of electoral politics and redistribution, and develop a series of hypothetical countries and electoral rules to evaluate the implications of electoral geography for redistributive policy. In addition to the manipulation of electoral geography, my formal theoretic analysis departs from the existing literature in two important ways: First, I make no assumptions about the effect of electoral rules on the number of parties that stand for election, and allow for multipartism (and coalition governments) under single member district rules. Second, I allow for the possibility of turnout bias, or the under-representation of low-income and middle-income citizens in the electorate. These deviations from the standard model will be more fully developed and justified in the following discussion. The last two sections of this discussion evaluate empirically the implications of electoral geography for redistributive politics in a broadly comparative analysis of contemporary democratic societies. I demonstrate that in countries in which electoral geography favors the representation of low-income citizens, we observe greater overall reductions in income inequality through redistribution, and higher levels of social spending. This analysis, therefore, provides support for the motivating intuition of this discussion, that the geographic distribution of income has important moderating implications for

our understanding of how electoral systems affect social policy.

2 Electoral Politics and Redistribution

Following Iversen & Soskice (2006; see also Acemoglu & Robinson 2006, Persson & Tabellini 2000), this section presents a standard group-based model of redistributive politics. Here, redistributive politics takes the form of a three-stage game: First, during a campaign period, parties commit to redistributive policies in anticipation of voter decision-making. Then, in a second stage, elections are held, and some citizens vote. In this analysis, voters cast a single (closed party-list) ballot, and seats are allocated to parties according to established single member district (SMD) or multi-member district (MMD) proportional representation (PR) electoral rules. Finally, governments are formed, and the governing party or coalition implements its most preferred policies perfectly. Redistributive politics, then, is reflected in voters' anticipation of the electoral outcome, and the likely government or governing coalition.

2.1 Citizens

To begin, suppose that there are three types of citizens, defined by their income. That is, there are low-income citizens (L), middle-income citizens (M), and high-income citizens (H). Let y_i denote earnings income, and assume:

$$y_L < y_M < y_H. \tag{1}$$

Then, let each citizen's indirect utility function be determined by their level of post-tax and transfer income:

$$V_i(p_i) = y_i - T_i + B_i = y_i + p_i \tag{2}$$

Here, T_i reports lump-sum taxes assessed for each citizen type, and B_i reports any benefits that are distributed to citizens of type i; p_i reports the net benefits of redistributive policy.

2.2 Parties and Election Campaigns

Parties are groups of citizens who together stand for election: party **L**, for example, is composed of low-income citizens. Assume that there are no costs or benefit associated with office-holding.

Parties campaign in the first stage of the election by proposing a redistributive policy. Policy proposals take the form of vectors, $\mathcal{P} = (p_L, p_M, p_H)$, that describe tax and transfer policies such that p_L reports net transfers to low-income citizens. Following Iversen & Soskice (2006), proposals are subject to several constraints: First, assume that for each income group, there exists a taxation capacity, $\overline{T}_i < y_i$, and that no group is taxed at a rate beyond this capacity:

$$p_i \geq -\overline{T}_i \text{ for all } i \tag{3}$$

This taxation capacity, for example, implicitly limits fully redistributive policies that may undermine earnings incentives. Nevertheless, by assumption, this taxation capacity increases with earnings.

$$0 = \overline{T}_L < \overline{T}_M < \overline{T}_H. \tag{4}$$

Notice that Eq. (4) also implies that the society's taxation capacity is equal to the taxation capacities of M and H. Therefore, a balanced budget constraint requires that the total income redistributed is equal to the sum,

$$\overline{T} \equiv \overline{T}_H + \overline{T}_M. \tag{5}$$

Finally, by assumption, policies are redistributive and weakly non-regressive:

$$p_L \geq p_M \geq p_H. \tag{6}$$

As Iversen & Soskice (2006) note, this non-regressivity assumption is weaker than similar assumptions typically made in formal analysis of tax-and-transfer policies (e.g., Meltzer & Richard 1981), and is empirically well-supported (e.g., Milanovic 2000). As we shall see, this assumption imposes important constraints on otherwise potentially viable coalitions: A governing coalition of low- and high-income voters, as we shall see, is rarely viable.

2.3 Forming Government

Parties that can form the government independently will implement their most preferred policies. Let the policy vectors $\mathcal{P}_i^*$ for each $i \in \{\mathbf{L, M, H}\}$ denote each (income group and) party's most

preferred redistributive policies, subject to the non-regressivity and balanced budget constraints described above:

$$\begin{aligned} \mathcal{P}_L^* &= (\overline{T}_M + \overline{T}_H, -\overline{T}_M, -\overline{T}_H) \\ \mathcal{P}_M^* &= (\frac{\overline{T}_H}{2}, \frac{\overline{T}_H}{2}, -\overline{T}_H) \\ \mathcal{P}_H^* &= (0, 0, 0) \end{aligned} \tag{7}$$

That is, low-income citizens would tax middle- and high-income citizens at their full taxable capacities, and distribute benefits exclusively among low-income citizens. Middle-income citizens would most prefer to tax the high-income citizens at their capacity, and share the benefits with the low-income citizens. Finally, high-income citizens prefer that no redistribution occurs.

When no party, however, is elected to the majority of seats in the legislature – regardless of the electoral rules – parties enter into negotiations to form a coalition government, which will then implement a compromise policy. Here, following Iversen & Soskice (2006), party negotiations are approximated by a Rubinstein bargaining process, between equally impatient parties (i.e., discount rates are set equal to one). The resulting coalition policies are summarized by the policy vectors, P_{ij}^*, when party i is the formateur:

$$\begin{aligned} \mathcal{P}_{LM}^* &= \mathcal{P}_{ML}^* = \left(\tfrac{\overline{T}_M + \overline{T}_H}{2}, \tfrac{\overline{T}_H - \overline{T}_M}{2}, -\overline{T}_H \right) \\ \mathcal{P}_{HM}^* &= \left(\tfrac{\overline{T}_H - \overline{T}_M}{3}, \tfrac{\overline{T}_H - \overline{T}_M}{3}, \tfrac{2(\overline{T}_M - \overline{T}_H)}{3} \right), \text{ and} \\ \mathcal{P}_{LH}^* &= \begin{cases} \left(\tfrac{\overline{T}_M + \overline{T}_H}{2}, -\overline{T}_M, \tfrac{\overline{T}_M - \overline{T}_H}{2} \right) & \text{if } -\overline{T}_M \geq \tfrac{\overline{T}_M - \overline{T}_H}{2} \text{ or } \overline{T}_M \leq \tfrac{\overline{T}_H}{3} \\ \left(\tfrac{2\overline{T}_H}{3}, \tfrac{-\overline{T}_H}{3} \tfrac{-\overline{T}_H}{3} \right) & \text{otherwise.} \end{cases} \end{aligned} \tag{8}$$

As Iversen & Soskice (2006, see Proposition II) demonstrate, these cases are exhaustive: Given the opportunity to be the formateur, H strictly prefers a coalition with M over a coalition with L. However, when **M** is the formateur, M has more to gain from a **M-L** coalition, than from a **M-H** coalition. Finally, L weakly prefers the policy resulting from a **L-M** coalition over the **L-H** compromise; L's preference for **L-M** becomes strict in societies characterized by more equitable tax capacity distributions.

2.4 Equilibrium Criteria

This analysis assumes that parties and voters have complete information about the outcome of the election. Thus, if citizens and parties know the distribution of types within the electorate, the electoral rules that govern the distribution of seats within districts, and the policies that will be implemented by the parties and coalitions that form the government, then sub-game perfection with weakly-undominated voting strategies is the appropriate equilibrium concept. Here, sub-game perfection implies that the policies proposed by parties are optimal given anticipated voter decision-making. Weak dominance requires that voters do not support a party that will implement a policy that is contrary to their interests.

In equilibrium, therefore, parties that can form the government independently will implement their most preferred policies. Otherwise, the formateur (here, the party with the largest seat share) will enter into coalition with their most preferred coalition partner, and together they will implement the compromise policies described in Eq. (8). Notice that, as a consequence, parties have no incentive to moderate their policies during the campaign period: Voters will not see these promises as credible. Voter strategies, therefore, can be summarized with regards to their expectation about which party or coalition will form the government, and the policies they will implement (see Table 1).

[Table 1 about here.]

Table 1 reports how citizens, with complete knowledge of the electoral geography of their societies – that is, the distribution of citizen types and legislative seats – will vote in equilibrium. The first column reports the expected governing party or coalition, and the cells of the table report citizens voting strategies as a result of these expectations. For example, in expectation of a majority government formed by **L**, L and H will vote by type, and M will vote strategically for party **H**. Notice that, in fact, both L and M have some incentives to vote strategically for parties other than that party which most closely represents their policy preferences: First, as illustrated above, in expectation of a **L** government, M may secure a better policy outcome by voting strategically for **H**. Similarly, if electoral geography ensures that **H** can secure a majority of seats in the legislature, L has an incentive to vote strategically for **M** , and will secure a more favorable outcome. L faces

similar incentives in anticipation of a **H-M** coalition (i.e., when no party holds the majority of seats, and **H** is likely to be the formateur). Thus, **H-M** coalition governments should rarely be observed: **H-M** coalitions are viable only when electoral geography inhibits **M**'s ability to form the government or serve as the formateur, even with the electoral support of L. Finally, in anticipation of a **L-H** coalition, M has strong incentives to vote strategically for **H**, which will implement a more favorable redistributive policy. Thus, **L-H** coalitions should also be rare: They are viable only when M's support of **H** does not allow **H** to form the government independently, or as a formateur (in which case, **H** can secure a better outcome by entering into a coalition with **M**), and an inequitable distribution of tax capacity leaves L indifferent between a coalition with **M** and a coalition with **H**.

2.5 Summary

In this section, I have presented a nearly-institutions-free model of redistributive politics: Only the timing of elections, relative to the implementation of policy, structures the decision-making of voters and parties. The next section of this discussion will introduce two innovations to the standard analysis of redistributive politics that have important implications for our understanding of how electoral rules contribute to social policy outcomes: turnout bias and electoral geography.

3 Turnout Bias and Electoral Geography

Suppose that low-income, middle-income, and high-income citizens comprise equal proportions of the population.[1] Further, suppose that there are some factors, exogenous to electoral competition, that prevent some citizens from voting. Assume that low-income citizens feel the effects of these factors more frequently than middle-income citizens, who themselves are less likely to turnout than high-income citizens.[2] Then, let π_i define the proportion of voters of type i in the electorate:[3]

$$\pi_L < \pi_M < \pi_H. \tag{9}$$

In this analysis, turnout bias is minimal and this assumption will operate as a tie-breaking rule. Nevertheless, the implications of even minimal turnout bias are especially important in plurality

elections contested in heterogeneous districts.[4]

To introduce electoral geography into this analysis, I maintain the national distribution of citizen types within the population – each comprising one third – and manipulate their distribution across different regions of a hypothetical country. Specifically, imagine three countries in which the population is distributed across three types of regions that are distinguished by their population density: There is an urban high-density region, a rural low-density region, and a suburban medium- or mixed-density region, with the composition of each region defined by π_i^U,π_i^R, and π_i^S, respectively. National income distributions can then be characterized by its relationship to population density.

COUNTRY E. (Even Distribution). When voter types are evenly and equitably distributed throughout a country, there may be no relationship between population density and income. Then, Eq. (9) characterizes both the national electorate and the electorate of every district of this first country-case.

COUNTRY R. (Rural Poverty). Suppose that income is *positively* correlated with population density, such that, although Eq. (9) characterizes the national population (i.e., although turnout bias remains, citizens types exist in approximately equal proportions in the national electorate), citizen types are concentrated in the different regions in the following way:

$$\begin{aligned} \pi_H^U > & \pi_L^U > \pi_M^U \\ \pi_M^S > & \pi_L^S > \pi_H^S \\ \pi_L^R > & \pi_H^R > \pi_M^R \end{aligned} \tag{10}$$

Thus, the high-income voters live predominantly in urban districts (denoted by the superscript U), areas surrounding cities ("suburban districts," S) are comprised of mainly middle-income and low-income citizens, and the low-income voters are the largest group of rural districts (R).

COUNTRY U. (Urban Poverty). Suppose, now, that income is *negatively* correlated with population density, such that although Eq. (9) characterizes the national population (i.e., although turnout bias remains, citizen types exist in approximately equal proportions in the national electorate), citizen types are concentrated in the different regions in the following

way:

$$\begin{aligned} \pi_L^U &> \pi_H^U > \pi_M^U \\ \pi_M^S &> \pi_H^S > \pi_L^S \\ \pi_H^R &> \pi_M^R > \pi_L^R \end{aligned} \tag{11}$$

As in the case of Country R, urban areas in Country U are comprised mainly of high- and low-income citizens, although now low-income citizens form the largest plurality in urban areas. Also in contrast to Country R, non-urban areas are composed of mainly high- and middle-income citizens.

In each of these countries, the population is spread across each region in approximately equal proportions, but with somewhat more suburban or medium-density citizens, and slightly fewer rural or low-density citizens. Although the terms urban, rural, and suburban provide a useful framework for this analysis, they do not convey any substantive meaning beyond population density.

Of course, the geographic distribution of voter types is only one component of electoral geography. We must also allocate legislative seats across electoral districts, and draw district boundaries. Figure 1 depicts the geographic distribution of voters, with each labeled area corresponding to 1/15th of the population. Thus, in each country, as described just above, one-third of the population resides in urban areas, denoted with $\mathbf{U_j}$, 6/15th's reside in suburban areas, denoted with $\mathbf{S_{jj}}$, and 4/15th's reside in rural areas, denoted $\mathbf{R_j}$. The dotted, dashed, and solid lines seen in Figure 1 correspond to three different allocations of legislative seats and districts across regions, or "assemblies," that are applied to each hypothetical country in the following analysis:[5]

Assembly S. (Single-Member Districts) All elections to the fifteen-member legislature are contested by plurality rules in SMDs.

Assembly N. (National Multi-Member District) All candidates contest the election in a single, nation-wide district, and seats are allocated according to a largest remainder PR rule (i.e., a Droop quota).

Assembly V. (Varying-Magnitude Multi-Member District Size) Under this set of electoral rules, the number of seats elected in each district varies with the population density: Five

members are elected in the urban district, six members elected in three two-member districts, and four members are elected in rural SMDs. Seats are allocated according to a largest remainder rule.

Note that assemblies S, N and V vary in two dimensions: First, the assemblies vary in the average number of legislators elected in each district. Second, the assemblies differ in the variance of legislators elected across districts (see Monroe & Rose 2002). Usually, analysis of the relationship between electoral rules and redistributive policy has focused on a comparison of assemblies S and N. However, as will become clear shortly, when the geographic distribution of voter types is taken into account, the important differences between assemblies N and V can generate different redistributive outcomes.

[Figure 1 about here.]

4 Analyzing the Implications of Electoral Geography for Redistributive Policy Outcomes

Given a particular geographic distribution of income, which electoral rules generate the most redistribution? This re-phrasing of the motivating research question – what are the implications of electoral geography for social policy? – provides a framework for the analysis of policy outcomes for each country, and under different sets of electoral rules. This section outlines the details of the equilibrium outcome for each of the nine cases considered (3 countries, 3 sets of electoral rules), and offers a summary of the findings before proceeding to a more general discussion of the implications of this group-based model of representation.

4.1 Policy Outcomes under the Rules of Assembly N

Because the national distribution does not change with the geographic distributions of voter types – all citizen types exist in approximately equal proportions – the rules governing Assembly N yield the same policy outcome for each country case. When the different groups of citizens comprise approximately equal shares of the electorate, the parties can expect to hold equal shares of seats in the assembly: **H**, **M** and **L** will each hold five seats. If, under these circumstances, the formateur

is chosen randomly, the modal outcome will be a coalition of the low-income and middle-income parties, **L-M** (or equivalently, a **M-L**) (see Iversen & Soskice 2006), which will implement the compromise policy, $\mathcal{P} = \mathcal{P}^*_{LM}$.

4.2 Policy Outcomes in Country E.

In most countries, however, elections are not contested in a single national district, and the interaction of the electoral rules and the geographic distributions of low-income citizens have important effects on legislators' incentives to seek the support of low-income citizens. In this section, and the two that follow, I consider the relationship between electoral rules and redistributive policy outcomes in countries with different geographic distributions of low-income citizens. As a benchmark example, I consider first Country E, in which all income groups are evenly distributed throughout the country.

Consider, first, electoral politics in the case where elections are contested in SMDs throughout the country (Assembly S): Although voters of each type exist in roughly equal proportions in each district, because of the turnout bias assumption, there are slightly more high-income voters than either middle- or low-income voters. Thus, if all citizens vote by type, **H** will win in every district, and implement its most preferred policy, $\mathcal{P} = \mathcal{P}^*_H$, in which no redistribution occurs. Note, however, that low-income citizens have an incentive to vote strategically for **M**, the party that represents middle-income citizens: Low-income citizens strictly prefer the policy proposed by **M** to that **H** proposes. Therefore, the party that represents middle-income citizens, **M**, will win the election with the support of L, although without any compromise in policy, and will implement the policy most preferred by middle-income citizens, $\mathcal{P} = \mathcal{P}^*_M$. High-income voters cannot improve this policy outcome by voting strategically, nor can the high-income party propose a policy other than its most preferred policy during the election campaign period: These campaign promises will not be credible.[6]

Now consider the case in which elections are contested in multi-member districts of varying size, and seats are allocated according to a PR rule (Assembly V): With an approximately equitable distribution of voters in each district, even a limited amount of turnout bias can create an enormous advantage for **H**. Here, **H** will win two seats in the urban district, one seat in each of the three suburban districts, and all four of the rural SMD seats – yielding nine of the fifteen seats available.

However, as in the case above, L can significantly improve policy outcomes by voting strategically for **M**, which will then be supported by approximately two-thirds of each district. With L's support, **M** will win at least two of the seats in the urban district, one seat in each of the suburban districts, and each of the rural districts. Again, **M** has no incentive to moderate it's policy, or otherwise be responsive to L, and will implement its most preferred policy when it forms the government.

Although more discussion of this point will be offered in the summary section, note that when income groups are evenly distributed throughout the country, low-income citizens do no better when elections are contested in multi-member districts of varying size, under PR allocation rules, than when elections are contested in SMDs. Further, in this country-case, only when elections are contested in a single national district, does a PR allocation rule yield more generous redistributive policy.

4.3 Policy Outcomes in Country R.

Consider, now, the country case in which low-income citizens are concentrated in rural regions: Which electoral rules will generate the the most redistributive policy in this case?

Consider, first, elections contested in SMDs (Assembly S): If citizens vote by type, then the party representing high-income citizens, **H**, will win five urban seats, the party representing middle-income citizens, **M**, will win the six suburban seats, and the party representing low-income citizens, **L**, will win the three rural seats. A coalition between the parties representing low- and middle-income citizens will form the government, and will implement the compromise policy, $\mathcal{P}^*_{LM}$. High-income voters, H, cannot improve this policy outcome by voting strategically for **M**: The high-income tax liability is the same under an **M-L** and an **M** regime, although transfers to low-income citizens are more generous. Similarly, low-income citizens secure a better outcome through a governing coalition with the middle-income party, than they could secure by voting strategically, and all three parties will receive votes in this election.

Assessing the electoral outcome when election are contested in varying-magnitude multi-member districts (Assembly V), is more challenging: There are many different geographic allocations of citizen-types that satisfy the criteria listed above, in Eq. (10). However, the allocation of seats within each district is more limited. To generate the distributions observed in Figure 2, I assembled a data-set that includes all (two-decimal-place) income-group allocations that jointly satisfy Eqs.

(9) and (10) ($n = 230,139$). Seats were then allocated to each party, using the Droop quota seat allocation rule. As seen in Figure 2, the most likely outcome (occurring in 46% of cases) awards the party that represents low-income citizens, **L**, eight seats (one urban, three suburban, and four rural), **M** three seats (three suburban), and **H** four seats (four urban). With a solid majority of the seats, **L** forms the government and implements $\mathcal{P} = \mathcal{P}_L^*$, without compromise. Note that M cannot improve this outcome by voting strategically for **H**: M may not comprise a sufficiently large share of the electorate in either the urban or rural districts to change the allocation of seats.[7]

[Figure 2 about here.]

Unlike the previous country case of Country E, in which the electoral rules of Assembly S and Assembly V did not yield different policy outcomes, these different electoral rules generate an important difference in policy outcomes when low-income voters are geographically concentrated in rural areas: Transfers to low-income citizens are considerably larger when elections are contested in MMDs of varying sizes, than in SMDs. Further, elections contested in varying-magnitude MMDs can generate more redistributive policy than even a single national district.

4.4 Policy Outcomes in Country U.

Finally, we consider the case in which low-income citizens are concentrated in urban regions (see Eq. 11), and distribution of income is positively correlated with population density.

When elections are contested in SMDs (Assembly S), if all citizens vote by type, **L** can expect to win 5 urban seats, **M** will win the 6 suburban seats, and **H** will win the four rural seats. As in the case of Country U, **M** will form the government with **L**, and will implement the compromise policy, $\mathcal{P}_{ML}^*$. Further, high-income voters, H, cannot improve this policy outcome by voting strategically for **M**.

As was the case in Country R, the many different allocations of voters that meet the criteria described in Eqs.(9) and (11) complicate the allocation of seats when elections are contested in varying-magnitude MMDs (Assembly V). However, as seen in the right panel of Figure 2, the most likely outcome allocates eight seats to the high-income party, **H**, four seats to low-income party, **L**, and three seats to the party that represents middle-income citizens, **M**.[8] **H** can form the government independently, and implement $\mathcal{P} = \mathcal{P}_H^*$. Note that L may not be able improve this

outcome by voting strategically for **M**: M and L may not comprise a sufficiently large share of the electorate in any district to change the allocation of seats.

As we saw in the case of Country R, the different electoral rules applied to a country in which low-income voters are concentrated in urban areas can generate quite different policy outcomes: Redistributive policy is much more extensive under SMD electoral rules (Assembly S), than when elections are contested under varying district-magnitude MMD rules (Assembly V)– a finding contrasts with previous research on the relationship between electoral rules and redistributive policy, in which MMD PR rules are generally associated with more generous redistributive policy.

4.5 Summary: The Redistributive Policy Implications of Electoral Geography

To facilitate a comparison of the nine electoral geographies considered here, suppose that cross-national differences can be summarized by an electoral concentration ratio,

$$\frac{\pi_L^R}{\pi_L^U} \tag{12}$$

that reports the ratio of the percentage of rural voters who have low-incomes to the percentage of urban voters who are similarly low-income. This measure, of course, takes a value of 1 in country E, in which all districts are characterized by an equitable distribution of poverty. Similarly, when low-income voters are concentrated in rural areas (Country R), this ratio takes values greater than one. Finally, this measure of low-income voter electoral concentration takes values less than one when low-income voters are geographically concentrated in high-density places (Country U). This electoral concentration measure, therefore, provides a way to order the hypothetical country-cases considered in this analysis; measures of the electoral concentration ratio are reported across the horizontal axis of the left panel of Figure 3. The vertical axis reports p_L for each set of electoral rules, for each country. In the right panel, the horizontal axis reports a different summary measure, **L**'s seat share, which will prove useful in identifying the empirical implications of this formal theoretical analysis.[9]

[Figure 3 about here.]

Focusing first on the left panel of Figure 3, recall our earlier research question: Given each geographic distribution of voter types, which electoral rules generate the most redistributive policy outcomes? Here, the important modifying effect of the geographic concentration of low-income citizens is quite clear: Notice, first, that much of the previous literature compares policy outcomes in national MMDs and SMDs, which correspond to points **A** and **A'** in Figure 3. As we have come to expect, distributions to low-income citizens are greater when elections are contested in a national MMD, than under SMD rules when low-income voters are evenly distributed throughout the country (Country E). However, when varying-magnitude MMDs and different geographic distributions of voter types are taken into account, the conventional wisdom – that MMDs and PR rules create incentives for more extensive redistributive policy – is less informative. Notice, for example, that when low-income citizens are evenly distributed and district magnitude varies, SMD rules yield the same policy outcomes as elections contested in MMD districts (point **A'** in Figure 3). Further, note how SMDs and MMDs of varying sizes affect policy when low-income citizens are concentrated in urban regions (Country U; points **C** and **C'**): Contrary to the conventional wisdom, in this case SMD rules yield more extensive redistributive policy than MMDs of varying sizes.[10] Finally, note that when low-income citizens are concentrated in rural regions (Country R), and elections are contested in varying-magnitude MMDs (though not in national MMD), policy is perfectly responsive to low-income citizens.

As suggested above, the right panel of Figure 3 summarizes these formal analytic examples in a different way: Here, the horizontal axis reports the share of seats a low-income voting bloc could secure in each country case (S_L)– that is, L's electoral power under each set of electoral rules, and for each geographic distribution of voters. Again, the vertical axis reports transfers to low-income citizens. As we see clearly in this Figure, the generosity of transfers increases with the share of seats a low-income voting bloc can secure, even when opportunities to vote strategically are taken into account. Important differences across SMD-MMD systems are less apparent than the conventional wisdom would imply: Instead, the joint geographic distribution of income groups and legislative seats that is reflected in the electoral power measure, offers a powerful explanation for cross-national differences in redistributive policy and poverty responsiveness.

The summary presented in Figure 3 draws attention to several further empirical implications resulting from this analysis. Here, I concentrate on two implications that are unanticipated by

previous work: First, in systems with SMD rules, redistributive policy ought to be more generous in those systems where low-income citizens are more frequently pivotal in the allocation of seats. Second, in systems in which district magnitude varies with population density, those countries in which low-income citizens are over-represented in rural areas ought to be characterized by more generous redistributive policy than in other countries with varying district magnitude electoral rules. The next section of this discussion will evaluate these within-system empirical implications, as well as the more general relationship between electoral geography and redistributive policy, in a broadly comparative analysis of contemporary democratic societies.

5 Electoral Geography and Redistributive Politics in Contemporary Democratic Societies

This section evaluates the core and distinguishing insights that arise out of the formal analytic examples presented in the previous section. Specifically, this section presents evidence that the generosity of redistributive policy generally increases with the seat share of a low-income voting bloc; that SMD systems in countries where a low-income voting block is more frequently pivotal implement more generous redistributive policy; and, that countries with varying-district magnitude systems and the concentration low-income voters in rural areas are more redistributive than other varying-district magnitude systems. Although this analysis uses standard measures of redistributive outcomes – the proportional reduction in income inequality, and social spending as a percentage of GDP (e.g., Iversen & Soskice 2006, Huber & Stephens 2001, Persson & Tabellini 2003) – the key independent variable, the seat share or electoral power of a low-income voting bloc, requires careful calculations that vary by country. This section, therefore, begins with a discussion of its measurement.

5.1 The Electoral Power of Low-Income Voters

How many seats could a low-income voting bloc elect, if all low-income voters turned out to vote, and they all voted the same way? Building on the formal analytic examples presented above, define S_L or the "electoral power" of a low-income voting bloc as the share of seats in the national legislature that low-income citizens could elect, if all low-income citizens turned out to vote, and

all low-income citizens cast ballots for the same party. As will be evident shortly, electoral power is a function of electoral geography – the joint geographic distribution of voters and seats *across* legislative districts– and of electoral formula, which provides the basis of the allocation of seats *within* districts. Importantly, the concept of electoral geography encompasses district magnitude in a general sense (whether more than one legislator is elected in each district), and the extent to which district magnitude varies across districts (see, e.g., Monroe & Rose 2002).

To measure the electoral power of a low-income voting bloc in contemporary developed democracies, this discussion proceeds in three steps:

1. First, using the best available resource for individual-level income data, the Luxembourg Income Study (LIS) and sometimes other data resources, I estimate the proportion of low-income voters in each electoral district, within each country. In addition to reporting income by source, LIS reports a variety of socio-demographic and geographic information for each respondent, which is especially useful for this analysis. Here, as in the formal analytic examples, "low-income" refers to those who comprise the lowest third of the national market income distribution. The set of 19 countries included in the analysis are those for which LIS V (1999-2002) data are available, and in which the thirty-third percentile of the national income distribution is at least as great as the official 2000 U.S. poverty line ($8,969). All countries included in this analysis have low-income thresholds that are at least 60% of the national median income, and are on average 73% of the median income.[11]

2. Second, using these proportions of low-income voters in each district, seats are allocated according to current electoral rules of each country.

3. Finally, the share of seats won by this low-income voting bloc in the national legislature is calculated for each country.

Notice that if electoral systems do not moderate the representation of different income groups, with this operationalization, each income group will have an electoral power measure equal to 33; each income group's seat share will equal exactly their share of the population. In electoral systems that favor the representation of low-income citizens, this measure of electoral power will be greater than 33. The rest of this subsection describes each of the steps involved in estimating S_L; further technical details, including data resources, are listed in the Appendix.

Characterizing the Geographic Distribution of Income

Three different strategies are used to estimate the proportion of each lower house electoral district that is composed of low-income households:

(A) Whenever possible, LIS data are used directly (e.g., Finland). LIS data offer important advantages for this analysis: LIS data represent a cross-national collaboration between income and labor studies, and offer large national samples with standardized income measures. When the LIS data report each respondent household's region of residence and the regions reported correspond to the country's electoral districts (or to regions that comprise the electoral districts), the proportion of low-income households in each district is estimated in a straight-forward way.[12]

(B) In several cases (e.g., the U.S.), data on the distribution of income within electoral districts are available from other sources. Sometimes the construction of income measures or samples differ from the measures or samples used in the analysis presented below.

(C) Finally, when income data corresponding to the electoral district are not available, LIS data are combined with other resources to estimate the proportion of low-income citizens in each electoral district.

To illustrate, the geographic distribution of low-income households in France was evaluated in several steps: While LIS data do not report each household's electoral district (*circonscription*), they do include each respondent's region of residence. One way to proceed, therefore, might be to use the regional proportions of low-income households to estimate the proportion of low-income households in each electoral district. This strategy, however, would fail to reflect within-region cross-district variance in the concentration of poverty.

Alternatively, although *Institut National de la Statistique et des Études Économiques* (INSEE) does not report income data that correspond to the measures of poverty used in this analysis, INSEE does report data on the structure of the labor force – data that correspond to LIS variables – within each electoral district. Using LIS data, I estimate the proportion of low-income households in each labor force status and industrial sector for each French region, and then use this relationship in combination with the INSEE labor force data to estimate

the proportion of low-income citizens in each district. This latter strategy has the advantage incorporating within-region across-district differences that are related to the distribution of poverty, but would be misleading if poverty rates vary within labor force status and industrial sector categories, within each region. For this reason, this strategy is pursued only when LIS regions do not correspond to electoral districts and other measures of the geographic distribution of income are unavailable or are quite different from the measure developed here.

As noted earlier, the Appendix reports the details for each country, including data resources.

Allocating Seats to a Low-Income Voting Bloc

The second task in assessing the electoral strength of a low-income voting bloc involves the allocation of seats according to the electoral rules of each system. Following the classification of electoral systems used in the formal analytic examples, this section of the discussion distinguishes between systems in which all legislators are elected in single-member districts (SMDs), systems in which all legislators are elected in a single nation-wide district, and systems in which the number of legislators varies across districts (usually in a way that reflects population density). Countries included in a fourth category, "mixed" electoral systems, form a hybrid category and typically have two or more levels of nested districts, with separate (but sometimes related) allocations of seats at each level. Using this classification, then, the next few paragraphs outline the general strategy used for seat allocations, for countries in each category of electoral rules.

Following Lijphart (1994, 28; also Boix 1999), this analysis sets an effective threshold of 35 percent for all SMD systems, and allocates a district's seat to the low-income voting bloc if the proportion of low-income voters exceeds 35 percent. Note that this relatively low threshold – recall that low-income citizens comprise the bottom third, or 33 percent of the national income distribution – will understate differences between SMD and MMD proportional representation systems in the representation of low-income citizens.

In the two countries in which seats are allocated in a single national district, according to a PR allocation rule – Israel and the Netherlands – a low-income voting bloc could secure a third of the seats in the legislature.

In varying district-magnitude MMD systems (including 'mixed" systems that elect some legis-

lators under MMD rules), seats within each district are allocated according to a Droop quota, even in systems which use a highest average allocation rule: In contrast to a highest average allocation rule, the Droop quota requires little knowledge and few assumptions about the number of parties competing in each electoral district or about distribution of support for other parties is needed to estimate the seats won by each party.[13]

Summary

How many seats could a low-income voting bloc elect, if all low-income voters turned out to vote, and they all voted the same way? Table 2 reports the results of this analysis, specifically the number of electoral districts in which low-income citizens are over-represented, and the shares of seats a low-income voting could win in each country. The data reported in Column (2) – an estimate of S_L – will serve as the key independent variable in the analysis that follows, the electoral power of a low-income voting bloc.

Note, first, that the success of a low-income voting bloc varies within electoral system groups, and particularly within the group of SMD countries. In the US and Canada, for example, the electoral success of a low-income voting bloc is potentially quite limited, while the largest seat share potentially won by a low-income voting bloc is observed in France, and the electoral power of low-income citizens in the UK is similar to the electoral power of low-income citizens in national-district (PR) systems.

Second, while there is a direct correspondence between the number of districts in which low-income voters are over-represented and their share of seats under SMD rules, there is, of course, no correspondence in the systems with varying district magnitudes. What matters for the representation of low-income citizens under varying district-magnitude MMD rules is whether or not low-income voters are over-represented in rural districts that elect a small number of legislators (e.g. Finland, Norway and Sweden), or in urban settings: Under these circumstance, the disproportionality of low-magnitude districts, typically found in the rural regions of these countries, can favor the legislative representation of the low-income voters.

Finally, with estimates of the proportion of low-income citizens in each electoral district, the varying district-magnitude systems can be classified according to whether poverty is concentrated in rural (low district magnitude) districts, or dispersed throughout the country. Column (3) of

Table 2 reports the ratio of the percentage of rural district citizens who have low incomes, to the the percentage of urban (high-magnitude) district citizens who have low incomes, for the set of varying-district magnitude systems included in this analysis.[14] To test the third implication of this analysis – that varying-district magnitude systems in which low-income voters are over-represented in rural districts will implement more generous redistributive policy – the countries with a rural concentration of low-income citizens ($\pi_L^R/\pi_L^U > 1$) will be compared to those countries with a more even distribution of low-income citizens ($\pi_L^R/\pi_L^U \approx 1$). There are no varying-district magnitude countries in which low-income citizens are over-represented in urban districts.

[Table 2 about here.]

5.2 Electoral Geography and Redistributive Politics: Empirical Evidence

What are the implications of electoral geography for social policy? Specifically, are more redistributive policies implemented in those countries in which low-income citizens can elect larger shares of the national legislature? To evaluate this general insight from the formal analytic examples, this section estimates the relationship between two measures of redistributive policy, the tax and transfer reduction in income inequality and general social spending, and the measure of electoral power, described just above and presented in Table 2.

[Table 3 and Figure 4 about here.]

Table 3 reports parameters estimated to describe the relationship between a low-income voting bloc's potential seat share, and the two measures of redistributive policy. As expected, there is a strong positive relationship: An increase of one-percent in the seat share of a low-income voting bloc contributes approximately seven-tenths of a percent in the reduction of income inequality, and about half a percent in total social spending. This positive relationship is evident, although slightly reduced and estimated with considerably more variance, even with the exclusion of the high-leverage outliers, France and the US (note that residual variance remains largely the same across specifications.) A strong, positive relationship between a low-income voting bloc's electoral power and redistributive policy is also evident in both panels of Figure 4: The percentage reduction in income inequality achieved through taxes and transfers and overall levels of social spending clearly

increase with the share of seats a low-income voting bloc can elect in the lower house of each country's legislature. More importantly, what Figure 4 makes clear is that this summary measure of each country's electoral geography – here, the electoral power of low-income citizens, or the joint geographic distribution of low-income citizens and legislative seats across districts – can generally account for cross-national variance in redistributive policy in contemporary democratic societies.

To evaluate the more specific empirical implications following from the formal analytic examples, consider, first, the SMD electoral systems: Notice that the general trend relationship between the electoral power of a low-income voting bloc and redistribution that is evident in the full set of countries, is especially prevalent in the set of SMD systems (represented by darker solid points in Figure 4). That is, under SMD rules, social spending and redistribution generally increase when low-income voters are geographically concentrated in ways that increase the probability that they are pivotal in the allocation of seats. This finding is unanticipated by previous research on the relationship between electoral rules and social spending.

[Table 4 about here.]

Similarly, the third empirical implication that follows from the earlier formal analytic examples – that when elections are contested in varying district-magnitude systems, redistribution ought to be most generous in those systems where low-income voters are concentrated in rural areas – also finds empirical support. Table 4 reports average reductions in income inequality and overall levels social spending for the varying district magnitude systems, and distinguishes those countries in which low-income voters are concentrated in rural areas from the others on the basis of the electoral concentration ratio,π_L^R/π_L^U. Clearly, even with the limited number of varying-district magnitude systems included in this analysis because of data limitations, those countries with rural concentrations of low-income citizens typically implement more redistributive policies, and report higher levels of social spending. This evidence is consistent with the empirical implications of the formal analysis presented earlier, and as suggested above, is unanticipated by earlier work on the relationship between social policy and electoral rules.

6 Conclusion and Implications

What are the implications of electoral geography for social policy? In a series of formal analytic examples, this discussion has demonstrated the important role of electoral geography in determining social policy. Contrary to existing research, the analysis presented here suggests that under some conditions, single member plurality systems may yield redistributive policy that is at least as progressive as the policy that would be implemented under proportional representation rules – an outcome that directly challenges the existing literature. Further, this discussion establishes an empirical pattern of policy responsiveness that reflects electoral geography: Social spending and redistribution increase with the share of seats elected by a low-income voting bloc.

Here, I have focused on redistribution and low-income voters – a specific type of policy and its intended beneficiaries – but the implications of this research for our understanding of the relationship between electoral rules and the quality of democratic representation are more extensive. To the extent that electoral geography complicates the mapping of votes-to-seats for a group of voters, electoral institutions may undermine legislators' incentives to represent the interests of that group. An appreciation of the implications of electoral geography is especially important for those national and sub-national governments that aim to implement electoral reforms; analysis of how electoral rules affect social policy and other political outcomes that fail to incorporate the varying distributions of interested and affected citizens may generate misleading empirical predictions.

More directly, this research has demonstrated the ways in which electoral geography can reduce or, perhaps, perpetuate the relationship between economic and political inequality. When low-income voters are rarely pivotal in the allocation of legislative seats, legislators may have few incentives to craft responsive anti-poverty policy. Alternatively, in systems in which the electoral support of low-income citizens is important to the success of proportions of national legislatures, many legislators will have strong incentives to represent the interests of those living in poverty, or at risk of poverty. Without major electoral reforms or other dramatic changes in a country's electoral geography (e.g., the accession of East Germany), the effects of legislators' electoral incentive structures are likely to be long-term and cumulative, determining both the social policy and the structure of the party system in each country. This discussion has provided some evidence that electoral geography is indeed important to the development of social policy, and in ways that

are unanticipated by earlier research. My second intuition – that electoral geography also shapes incentives for the partisan representation of low-income and working class voters – will be explored in future research.

Appendix A Measuring the Electoral Power of the Poor

This Appendix reports the specific details of the estimation strategy for each country, and lists the electoral districts in which a low-income voting bloc could elect (lower house) members of the national legislature, and is organized according to types of electoral systems, with the main distinction reflecting the number of legislators elected in each district.

Single Member District Systems

(A) Simple Plurality Rules

Canada. Estimates of the proportion of low-income citizens in each electoral district are calculated using 2001 Census data (corresponding to 2000 calendar year Statistics Canada 2003), reported for each Federal Parliamentary Riding (2003 Representation Order). The income measure includes all sources of income, including social transfers and is reported by income category, for men over the age of 15. This analysis distinguishes those with total income between $1,000 and $19,999 (in Canadian dollars; an amount slightly more than the $17,821 threshold observed in the LIS data), from those earning higher levels of income. Following the strategy used in the other single member, simple plurality systems, a threshold of representation of 35% is used to identify electoral districts in which low-income citizens are likely to be pivotal.

United Kingdom. To identify those electoral constituencies in which low-income citizens are likely to be pivotal, I used data collected under the auspices of the *Annual Survey of Hours and Earnings* (Office for National Statistics 2002). This data-set reports deciles of the gross income distribution within the (202) local authorities in the UK. These low-level geographic areas were matched to parliamentary constituencies according to the "Standard Names and Codes" (SNAC) protocol, provided by National Statistics. Then, those districts in which the 30th percentile of the district income distribution was less than the 30th percentile of the the national market income distribution

(as reported in Office for National Statistics, approximately $18,333) were identified as those districts in which low-income citizens are pivotal. Note: The ASHE data offer the important measures of gross earnings distributions (the main component of market income), at much lower levels of geographic aggregation than is available through LIS, which uses the 11 Government Office regions (these are also correspond to the Eurostat NUTS 1 regions). The ASHE data, however, provide a conservative estimate of the proportion of low-income citizens in any district: Only individuals with earnings are included in the sample. As a consequence, the estimate of the number of seats a low-income voting bloc could secure is likely quite conservative.

United States. Estimates of the percentage of the each congressional district electorate composed of low-income households are generated using the *US Census of Housing and Population, Summary File 3* (U.S. Census Bureau 2002). These data offer the important advantage of direct correspondence to congressional districts. It should be noted, however, that the SF3 data report total income– a measure that includes social transfers, as well as earnings income, etc. – rather than market income. Further, because of the way in which these data are reported, a poverty threshold of $24,999 was used, instead of the LIS working-age equivalent-household threshold, $20,613: This threshold reflects the 30th income percentile for these non-equivalent household total income data.

To calculate the seat share a low-income voting bloc could secure in the House of Representatives, I use Lijphart's (1994) effective threshold of representation for majoritarian systems, 35%: If low-income households comprise 35% or a greater share of the congressional district, it is allocated the seat from that district.

(B) Alternative Vote Rules

Australia. Seats in Australia's House of Representatives are elected under Alternative Vote Rules (ATV), in single member districts (of "Commonwealth Electoral Division"). ATV rules are similar to the single member, simple plurality rules that regulate elections in the United States, the United Kingdom and Canada in that candidates who receive the majority of the vote are elected. However, when all candidates fail to secure a majority of the votes cast – when, under SMSP rules, seats are allocated to the candidate who wins a plurality of the votes cast – ATV rules invoke voters' ranking-ordering of preferences. Ballots in which the voters' first preferences are allocated to the

candidate winning the smallest vote share are re-allocated to the candidates ranked second by these voters. This process is repeated, with ballots reallocated at each step and according to voters' preferences, until a candidate has secured the majority of the vote share. In practice, however, although at least four major parties compete for election, most of the seats are allocated to two major parties or coalitions, and election results closely resemble outcomes that characterize elections held under SMSP rules. For this reason, and to limit the influence of assumptions made about the number of parties competing, this analysis uses the same seat allocation rule as was used in the SMSP systems: Seats are allocated to the low-income voting bloc in those districts in which the proportion of low-income citizens exceeds 35% of the population.

To estimate the proportion of low-income citizens in each district, I use income data collected as part of the 2001 Census: For each district, the Australian Bureau of Statistics reports the number of individuals in 14 gross income categories (including social transfers) and eight age categories (Australian Bureau of Statistics 2001). Including only working-aged individuals (in this case, 25-64 years old), estimates of the number of low-income citizens are based on the number of individuals whose yearly earnings are less than $10,884 (AUD$15,599), an amount slightly lower than the LIS working-age equivalent-household threshold, ($13,954).

(C) Two-Round Majoritarian Rules

France. Legislative seats in France are allocated in single member districts, when a candidate secures 50% of the votes cast in their district. If, after the first round election, no candidate has secured this majoritarian, the two candidates who secured the largest vote shares stand in a a second round election. The candidate winning this second round election will then be allocated the seat. Following Lijphart (1994) and Powell (2000), I use the 35% threshold of representation, and allocated seats in those districts in which low-income citizens comprise at least 35% of the district to a low-income voting bloc.

Under current rules, seats are allocated in 555 single-member electoral districts ("circonscriptions électorales", plus 15 overseas SMDs). While income data are not available at this low level of aggregation, census data collected in 1999 on the composition of the labor force are available for each district (National Institute for Statistics and Economic Studies (INSEE) 2002). Using the

LIS data to generate estimates of the proportion of low-income households for each labor force category (in which the head of household is classified as employed in agricultural, industrial, construction, service work, or is unemployed), for each of eight regions, and then using these regional proportions, the proportion of low-income citizens in each district is estimated in a way that reflects within-region variance in labor market conditions.

Varying District Size-Magnitude Systems

(A) Single Transferable Vote

Ireland. Legislators in Ireland's lower house of representatives, ("Dail Eireann") are elected in MMDs and seats are allocated according to a Single-Transferable vote rule. In practice, this implies that voters rank candidates on a single ballot, and in a first allocation, seats are distributed according to a Droop quota "largest remainder" formula. The surplus votes cast in favor of any candidate whose share of votes exceeds the quota (and thus is automatically elected) are redistributed to candidates who are listed as each voters' second preference, in proportion to the preferences of all ballots cast in favor of the successful candidate. Seats are allocated to each candidate whose vote share exceeds their district's quota, and votes are re-distributed until all of the seats in the district are filled. If, at any stage in the allocation of seats, no candidate is supported by a share of votes which exceeds the quota, votes for the least popular candidate are re-distributed according to the distribution of preferences expressed by her supporters.

To estimate the number of seats won by a low-income voting bloc in Ireland, I consider only the first allocation of seats, using the approximation of the Droop quota as the basis of this calculation. This strategy avoids assumptions about the number of candidates competing in each district and voters' rank order preferences.

Generating estimates of the proportion of low-income citizens in each constituency involves a number of steps: The LIS data report the Eurostat NUTS 3 region for each household. Each of the eight NUTS 3 regions, however, includes between two and 12 districts (in the Midland and Dublin regions, respectively), each electing three to five seats. Fortunately, although the Central Statistics Office Ireland does not report distributions of income within the 43 electoral districts, the published census data include the number of employed and unemployed (male) residents for

each district. Using corresponding head-of-household employment status data, which are included in LIS, I've identified the proportion of low-income households in each employment status group, for each region, and use these proportions here to estimate the proportion of low-income citizens in each electoral district. This strategy offers the important advantage of incorporating within-region variation in the geographic distribution of income by incorporating differences in the structure of the labor market; an alternative strategy would be to simply impute the region proportion of low-income citizens for each electoral district. In practice, proportions of low-income citizens estimated in this way have regional means that are within a one or two percentage points of the LIS-generated regional proportions.

(B) Single-Tier Systems

Belgium. Legislative seats in Belgium are allocated in 11 multi-member districts (largely corresponding to provinces) that range in magnitude from 4 seats in Luxembourg, to 24 seats in Antwerp. Although seats are typically allocated according to "highest average" d'Hondt formula, this analysis uses the Droop quota approximation as the basis of this analysis.

As with several of the other countries included in this analysis, unfortunately, income data are not available at the district level of analysis. Data on the age structure of each district, however, are available for each district through Eurostat, and can be usefully combined with regional information about the geographic distribution of poverty from the LIS data-set. In this case, Eurostat unemployment data yield within-region proportions of low-income citizens that are quite different from BI'S estimates of regional proportions. The Eurostat age data, used here instead of unemployment rates, yield within-region estimates that are much closer to the LIS regional estimates. The LIS data provide the respondents' region of residence (Brussels, Flemish Region and Walloon Region), as well as their age. To estimate the number of seats a low-income voting bloc could secure, first, using LIS data, I calculate the regional proportion of low-income citizens in several age categories that correspond to Eurostat age categories. Then, I use these proportions to estimate the number of low-income citizens, given their age distribution, for each district. This strategy has the important advantage of reflecting within-region district-level variation in the composition of the districts.

Finland. Legislative seats in Finland are allocated in way that is similar to the Belgian allocation of seats: 200 seats are allocated in 15 multi-member districts that range in the number of seats allocated from one in Aland, to 34 in Uusimaa, according to the d'Hondt formula (the modified Droop quota, described above, is used here instead). With a few exceptions, the boundaries of the electoral districts correspond to the boundaries of Finland's 20 administrative districts. The city of Helsinki comprises a district in itself, and several electoral districts combine two or three administrative districts. Because the LIS data identify the administrative district of each household, the geographic distribution of income can be estimated directly from the LIS data; no supplementary data are needed.

Luxembourg. Elections to Luxembourg's 60-seats legislature are contested in four multi-member districts that range in magnitude from 7 to 23 seats. Seats are allocated according to the Droop quota.

The LIS data, however, provide no geographic information about the location of the Luxembourg respondents. To estimate the geographic distribution of income, therefore, I use a strategy similar to that implemented in the analysis of Belgium: Using the relationship between age (of household heads) and low-income status, and data on the age structure within each Luxembourg canton (which combine to form the electoral districts Statec 2003), I estimate the proportion of low-income voters for each district. Then, using the Hagenbach-Bischoff seat allocation rule, I estimate the number of seats a low-income voting bloc could secure in Luxembourg's Chamber of Deputies.

Norway. Legislative elections in Norway are contested in 19 multi-member districts, that range in the number of seats elected from 4 (in Aust-Agder) to 17 (in Oslo). The electoral districts correspond to the Norwegian counties; the numbers of seats in each district reflect both the distribution of the population and the geographic size of each county, with the result that voters in rural areas are over-represented in the *Storting*. Following elections, seats are allocated first according to the modified Saint-Laguë method, which uses a slightly different quota from the more common d'Hondt allocation rule used in several of the other systems included in this analysis (the d'Hondt denominator is replaced by the series $1.4, 3, 5, .., (2s^p_{t-1} - 1)$). Then, an additional "leveling" seat is allocated within each district to the party whose seat share is less than its vote share (provided that the party meets the nation 4% threshold). The number of seats elected in each district varies

slightly across elections; the analysis presented here reflects the 2001 distribution of seats.

The LIS data do not report the Norwegian respondents' region of residence. Therefore, to estimate the distribution of poverty, I use the national relationship between low-income status, age (whether the respondent is 25-39 years of age, or aged 40-54), and labor market activity (whether the head of household is employed, unemployed or receiving a pension), in combination with similarly-coded data on the county-level relationship between age and labor market activity (Statistics Norway 2001).

Spain. Spain's 52 provinces serve as the multi-member districts for the Congress of Deputies. Although a PR allocation rule was used, seats are allocated (according to the d'Hondt "highest average" formula, though the approximate Droop quota is used in this analysis) such that each province has at least two seats (plus one seat for each of Spain's autonomous cities, Ceuta and Melilla); the distribution of the remaining 248 seats reflects the distribution of the population. As a consequence, most districts elect fewer than eight seats, while the districts that include Barcelona and Madrid elect 31 and 35 legislators, respectively.

LIS data identify the (NUTS 1, groups of autonomous communities) region of each respondent household, but not the province in which they reside. Regions include between one (Madrid) and 16 (Castile and Léon) provinces. Fortunately, Spain's Instituto Nacional de Estadística reports data on the structure of the labor force (by industrial sector and rates of unemployment) within each province (for the first quarter of 2000 Instituto Nacional de Estadística N.d.). Using LIS data on the economic activity and industrial sector of each working-aged head of household, in combination with income data for each household, I have calculated the proportion of low-income households in each labor force group (agricultural, industrial, service, construction and unemployed works), for each region. Then, using these regional proportions, I estimate the proportion of low-income households in each labor force category for each province.

Switzerland. Seats in Switzerland's National Council are contested in the 26 districts (corresponding to the cantons and half-cantons), each electing between 1 (in 6 cantons) and 34 legislators (in Zurich). Ballots are cast in complex ways, as voters can cast votes for candidates across party lists, or cast multiple votes for their most preferred candidates. Seats are allocated according to the Hagenbach-Bischoff highest average rule. Although there are differences in practice, particularly

in small electorates, here the Hagenbach-Bischoff allocation that is functionally equivalent to the Droop quota.

LIS data report only the region of each respondent's residence, not the canton, and so a strategy similar to that used in several other cases included in this analysis is used here, as well: Swiss Statistics reports the distribution of workers over three economic sectors (primary, secondary and tertiary), as well as the unemployment rate, for each canton, in the on-line *Regional Portraits*(Swiss Statistics 2004). Using the LIS data, the proportion of low-income households is calculated for each of these categories (using the head of household's economic activity). Finally, using these regional proportions in combination with the Swiss Statistics data on the composition of the labor force within each canton, I estimate the proportion of low-income citizens in each canton.

(C) Multi-Tier Systems

Austria. Legislative seats in Austria's National Council are allocated in three steps, or across three tiers: Voters cast ballots for candidates contesting seats allocated within 43 local electoral districts, or *regionalwahlkreise*, and for candidates competing for election within the Austrian states (*landeswahlkreise*). Allocations within the states are compensatory: Seats won within districts are subtracted from state-level allocations. A final allocation of seats occurs at the national level, and taking into account all valid votes, and allocates any remaining seats to parties that have secured at least one lower-tier seat or four percent of the national vote share.

To identify the strength of a low-income voting bloc in this complex system, I replicate these three stages of seat allocations, using LIS and data published in the *"Statishisches Jahrbuch"* (Statistik Austria 2008). LIS data report each respondent's region of residence. Statistik Austria reports the composition of the labor force (specifically, the number of workers in the primary, secondary and tertiary sectors, and the number of registered unemployed workers, in 2001 and 2002, respectively) for each of the 35 NUTS 3 regions, which correspond to groups of *Bezirks*, Austria's traditional "districts" and independent cities. Then, using the regional relationship between labor force group and low-income status, observed in the LIS data, in combination with the Statistik Austria labor force composition data, I estimate the proportion of low-income citizens in each electoral district.

Denmark. Legislative seats in Denmark's *Folketing* are allocated in two tiers, first according to the Sainte-Lägue highest average allocation rule in 17 multi-member districts (corresponding to Denmark's counties), and second, in a compensatory allocation, according to the Danish highest average formula.[15] As a consequence of this two-tiered allocation, Danish seat allocations are highly proportional, with party seat shares closely matching their national vote shares.

To estimate the electoral power of a low-income voting bloc, LIS data can be used directly: The county of residence is reported for each respondent.[16]

Sweden. Elections to the *Riksdag* are contested in 29 MMDs (*valkretsar*), with 39 seats allocated in a second nation-wide tier to ensure the proportionality of the result, for those parties securing at least four percent of votes cast, or 12 percent of the votes cast in any constituency. A modified Sainte-Lägue highest average allocation rule is used for the allocation of seats in both tiers. Following the convention established above, a Droop quota is used in the allocation of first-tier seats in this analysis. (Seats allocated in the second tier are excluded from this analysis to avoid assumptions about the distribution of support for other parties.)

Although LIS data do not report the electoral districts in which each Swedish respondent lives, LIS does report each respondent's county. With two exceptions, the boundaries of the 22 counties largely coincide with the boundaries of Sweden's electoral districts: The Skåne county contains four electoral districts, and Västra Götalands county is comprised of five electoral districts. Here, the county proportions of low-income citizens are used for each of the composite districts.

Notes

[1]Recall that absolute differences between income levels of each group are reflected in voter decision-making and coalition formation.

[2]The under-representation of low-income citizens in the electorate is well-established empirically. See, e.g., Nevitte, Blais, Gidengil & Nadeau (2009).

[3]This assumption is slightly different from the assumption Iversen & Soskice (2006) make about the composition of the electorate. Iversen & Soskice (2006), assume, instead, that "the voting population is equally divided between the three groups."

[4]Earlier versions of this paper also considered a case in which voters were evenly distributed

across geographic regions of the country, but in which turnout bias was severe, and high-income voters out-numbered low- and middle-income voters together. In this case, as might be expected, electoral rules did not make any difference in policy outcomes: The high-income voters' preferences prevailed.

Rates of turnout among different income groups are probably endogenous to the electoral success of each party. While this topic will be explored in future research, to facilitate this analysis, turnout bias is assumed to be exogenous.

[5]Recent research ties the adoption of MMD electoral rules to the preferences of parties, and specifically to the rise of social democratic and workers' parties (e.g., Cusack, Iversen & Soskice 2007, Boix 2003). Future research will build on the analysis presented in this discussion to consider endogenous party formation and how historical electoral geography contributed to preferences over electoral rules. Here, for now, electoral systems are assumed to be exogenously fixed.

[6]This outcome, of course, is quite different from what Iversen & Soskice (2006) find: Iversen & Soskice assume two-party competition under SMD rules, and that the parties are composed of low- and middle-income citizens, on the one hand, and middle- and high-income voters, on the other. Middle-income voters, therefore, are pivotal and must evaluate the credibility of the compromise campaign platforms. A government formed by the **L-M** party will likely implement a policy that is more redistributive than middle-income voters would prefer, and so middle-income voters support the **M-H** party, instead.

Although the analysis presented in this discussion does not assume national two-party competition under SMD rules, this formal analytic example provides some insight into how national two-party competition might result: When voters are evenly distributed across SMDs (and the districts are quite heterogeneous), and turnout bias favors the election of a party that represents high-income citizens, low-income citizens have strong incentives to voter strategically for the party representing middle-income citizens. As a consequence, the party representing low-income citizens will not receive even a single vote, and if there are costs associated with contesting elections (although these were not incorporated into this analysis), may have no incentive to stand. Then, national two-party competition will occur between the parties that represent the interests of high- and middle-income citizens, and as long as turnout bias is limited, governments will typically be formed by the party that represents middle-income citizens. Importantly, neither party will have an

incentive to moderate its policy to be responsive to low-income citizens, and redistributive policy will be quite modest. Finally, that if turnout bias is particularly severe, the party that represents middle-income citizens will not be able to form the government, even with the support of low-income citizens, and the government will be formed by the party that represents high-income citizens.

[7]The second most likely allocation (occurring in 41% of cases) allocates five seats to the party representing middle-income citizens, **M**, and three seats to the party representing high-income citizens, **H**; the party that represents low-income citizens, **L**, maintains the plurality of seven seats. As the formateur, **L** negotiates a coalition government with either **M** or **H**, depending on the distribution of taxation capacities; see Eq. (8).

[8]This outcome occurs in 46% of cases. The second most likely seat allocation, occurring in 41% of cases, awards seven seats to **H**, three seats to **M**, and five seats to **L**. In this case, **H**serves as the formateur, and enters into a coalition government with **M**.

[9]Here, I focus on distributions to low-income citizens, and thus, the electoral geography of low-income citizens: Unlike distributions to middle-income citizens, which are equivalent across some country-electoral system pairs, distributions to low-income systems fully capture the extent of redistribution that characterizes each country case.

[10]Following Monroe & Rose (2002), MMD rules dilute the electoral strength that comes with geographic concentration, and ultimately result in no redistribution of income.

[11]These restrictions for inclusion – that the thirty-third percentile of the national income distribution is at least as great as the official 2000 U.S. poverty line ($8,969), and that this low-income threshold is at least 60% of the median income – are intended to bolster the functional equivalence both of poverty, and poverty responsiveness in the set of countries included in this analysis. Countries that are included in LIS V, but excluded from this analysis are Estonia, Greece, Hungary, Mexico, Poland, Romania, Russia, and Taiwan. All LIS calculations are based on LIS-equivalent working-aged households (i.e., following standard practice, income amounts are divided by the square root of the number of household members, for households in which the head of household is between 25 and 59 years old), and currency standardized to 2000 US dollars.

[12]In several cases (France, Belgium, Ireland, Luxembourg, and Spain), LIS data report only net income – market income minus employer and employee social insurance contributions and taxes –

rather than market income.

[13]When seats are allocated according to a highest average allocation rule, vote totals are divided by a pre-determined series of numbers (i.e., 1, 2, 3, 4..., in the case of a d'Hondt allocation rule), yielding a and seats are allocated in rank order across all quotients, or "averages." In contrast, the largest remainder Droop quota allocation rule calculates a quota based on the number of seats to be elected in each district, (Total Valid Votes/(Seats + 1)) + 1, and allocates seats according to the ratio of this quota to each party's vote share.

[14]The electoral concentration ratio of rural-to-urban percentages of low-income voters is based on the proportion of low-income voters in the three highest and lowest magnitude districts.

[15]This formula is similar to the d'Hondt formula, but like the Sainte-Lägue formula, uses a different series of divisors.

[16]Although the cities of Copenhagen and Frederiksberg together form three electoral districts, they jointly form one LIS category.

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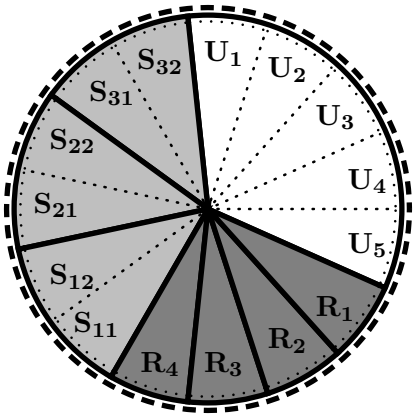
Table 1: Citizen Voting Rules Under Different Policy Proposals

Expected Governing Party or Coalition	Voting Rule, by Citizen Type		
	L	*M*	*H*
L	**L**	**H**	**H**
M	**L**	**M**	**H**
H	**M**	**M**	**H**
L-M, M-L	**L**	**M**	**H**
L-H	**L**	**H**	**H**
H-M	**M**	**M**	**H**

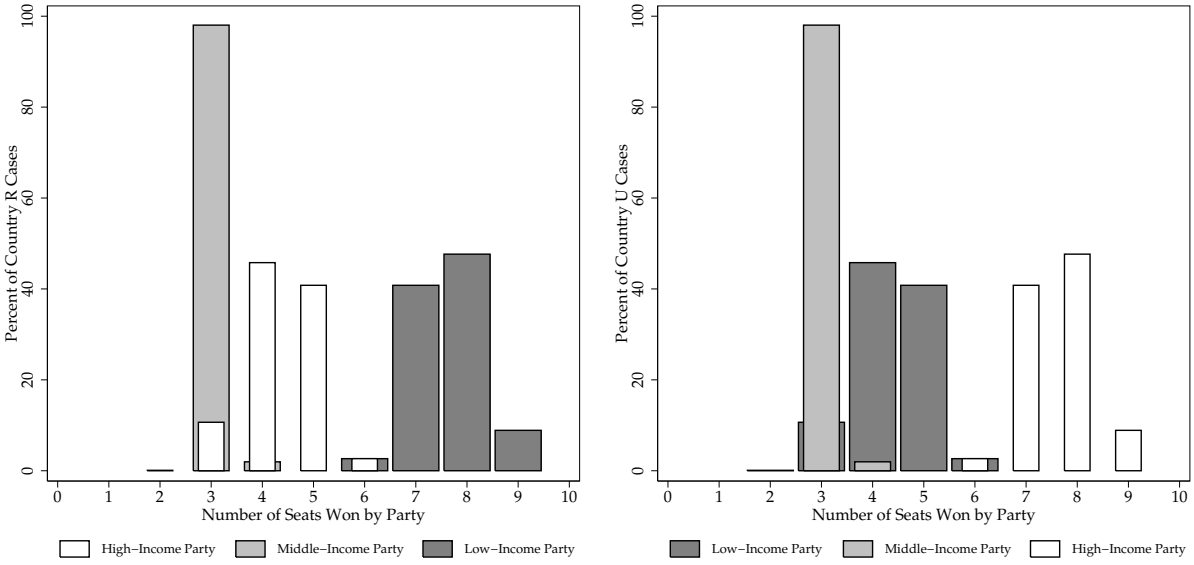
NOTE. This Table reports citizen voting rules, in anticipation of majority governments formed by each party and each viable coalition. In each coalitions **I-J**, party **I** is the formateur. Cells report which party each citizen type will vote for, in anticipation of a government formed by the party or coalition listed by row headings.

Figure 1: District Structure Under Different Electoral Rules



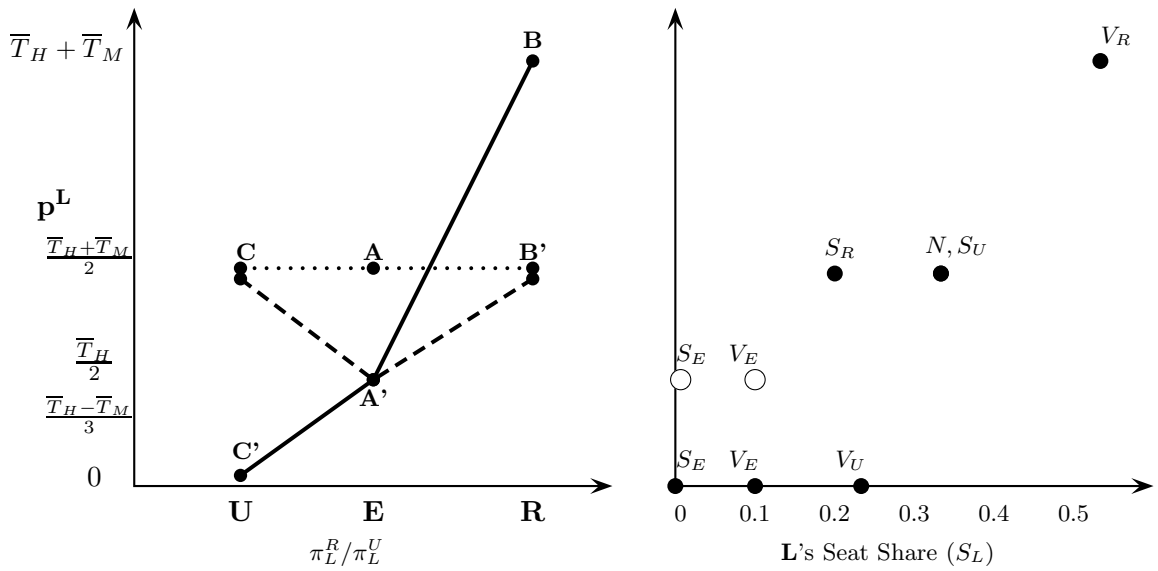
NOTE. This Figure reports the nested structure of the electoral districts of Assemblies S (denoted by dotted lines), N (denoted by the dashed line), and V (denoted by solid lines). $\mathbf{U_j}$, $\mathbf{S_{jj}}$ and $\mathbf{R}$ denote legislators elected in urban, suburban, and rural areas, respectively.

Figure 2: Electoral Geography in Countries R and U



NOTE. This Figure reports the corresponding distributions of seats when income-group allocations jointly satisfy Eqs. (9) and (10) (rural poverty; left panel) or (11) (urban poverty; right panel). Seats are allocated using the simple Largest Remainder (Droop quota) formula.

Figure 3: Policy Outcomes Under Different Electoral Rules



NOTE. This Figure reports policy outcomes under different electoral rules, Assembly S (dashed line), Assembly N (dotted line), and Assembly V (solid line), for the different country cases. In the left panel, the horizontal axis reports the degree to which low-income citizens are geographically dispersed, with higher values indicating a more even distribution.

In the right panel, the horizontal axis reports **L**'s seat share. Hollow points correspond to policies implemented when L votes strategically for **M**; L votes by type otherwise (indicated by solid points). Labels correspond to assembly (S, V or N), and subscripts denote the geographic distribution of voters (an Even distribution, or a distribution that concentrates poverty in Rural, or Urban areas).

Table 2: Seats Elected by a Low-Income Voting Bloc

Country	(1) # of Districts[a]	(2) Seat Share[b]	(3) π_L^R/π_L^U
Single Member District Systems			
United States	104/435	24%	
Canada	94/308	30%	
United Kingdom	190/569[c]	33%	
Australia	51/150	34%	
France	267/570[d]	47%	
National District Systems			
Netherlands	0/1	33%	
Israel	0/1	33%	
Varying District-Magnitude Systems			
Austria	1/43	33%	1.04
Belgium	5/11	33%	1.37
Denmark	12/17	33%	1.31
Luxembourg	0/4	35%	1.00
Spain	28/52	35%	1.77
Ireland	12/43	36%	. [e]
Finland	9/15	37%	1.47
Switzerland	21/26	37%	1.34
Norway	14/19	38%	1.02
Sweden	20/29	40%	1.14

NOTES. This Table reports estimates of the number of seats that a low-income voting bloc could secure if all low-income citizens cast ballots, and cast ballots for the same party. Please refer to the Appendix materials for details of how these estimates were calculated.

[a] This column reports the number of districts in which low-income citizens are over-represented.

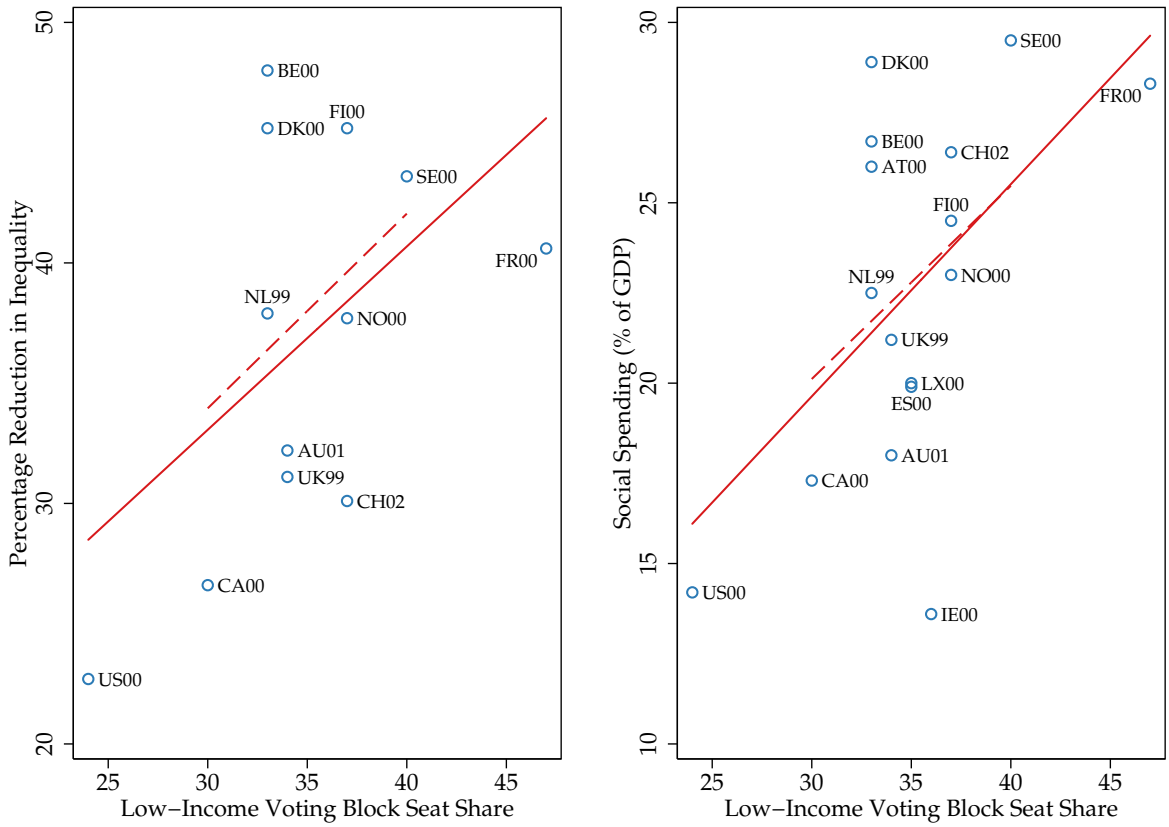
[b] This column reports the total share of seats secured by a low-income voting bloc. The districts in which these seats are secured are listed in the Appendix materials.

[c] Parliamentary constituencies in Scotland and Northern Ireland are excluded.

[d] The 15 overseas districts are excluded from the denominator reported in this column, but are included in the calculation of the seat share a low-income voting bloc could win.

[e] Although Ireland's districts vary in magnitude, like the SMD systems, the number of districts (rather than legislators) in each region vary with historical population density, and the number of legislators elected within each district ranges from 3 to 5.

Figure 4: Electoral Geography and Redistributive Politics



NOTE. This Figure reports the bivariate relationship between two measures of redistributive policy, the proportional reduction in income inequality and social spending as a percentage of GDP, and the seat share of a low-income voting bloc. Solid lines report least-squares fitted values for the full sample; dashed-lines report least-squares fitted values for an analysis that excludes France and the US. Parameter estimates are reported in Table 3.

SOURCE. Proportional reduction in income inequality: Jesuit & Malher (2004). Social Spending, as percentage of GDP: Organisation For Economic Co-Operation and Development (OECD) (2004).

Table 3: Electoral Geography and Redistributive Politics (Parameter Estimates)

	% Reduction in Income Inequality		**Social Spending (% of GDP)**	
	Full Sample[a]	Excluding France & the US	Full Sample	Excluding France & the US
Low-Income Voting Block Seat Share	0.76	0.81	0.58	0.54
	(0.40)	(0.88)	(0.23)	(0.51)
Intercept	10.19	9.67	1.98	4.05
	(14.14)	(30.80)	(8.07)	(18.00)
N	11	10	16	14
RMSE	7.39	7.67	4.33	4.63

NOTE. This Table reports least-squares estimates for the full sample, for each dependent variable, and for analysis that excludes France and the US. Standard errors are reported in parentheses.

[a] Market income measures are not available for all LIS countries.

SOURCE. Proportional reduction in income inequality: Jesuit & Malher (2004). Social Spending, as percentage of GDP: Organisation For Economic Co-Operation and Development (OECD) (2004).

Table 4: Redistribution under MMD Electoral Rules

Geographic	**% Reduction in Income Inequality**	**Social Spending (% GDP)**
Rural Concentration	42.6	25.9
	n=5	n=6
Even Distribution	37.7	23.0
	n=1	n=3
Difference	4.9	2.9
SE	(3.2)	(2.2)

NOTE. This Table reports differences in measures of redistribution for varying-district magnitude countries in which low-income voters are concentrated in rural regions, or are otherwise dispersed across rural and urban regions (see Table #).

SOURCE. Proportional reduction in income inequality: Jesuit & Malher (2004). Social Spending, as percentage of GDP: Organisation For Economic Co-Operation and Development (OECD) (2004).