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Electoral geography and redistributive politics

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Abstract
This paper offers a new electoral geography perspective on two stylized facts that do not fit easily with our current understanding of the implications of electoral rules for electoral politics and social policy: (1) proportional representation (PR) electoral rules are not always associated with more generous social spending. In some cases, we observe comparatively high levels of social spending in majoritarian single-member district (SMD) systems. (2) Contrary to our theoretical expectations, national two-party competition occurs rarely, even under SMD rules. Here, I demonstrate the importance of electoral geography through a series of analytic examples that are based on a simple model of electoral politics, and in which all possible combinations of electoral boundaries, rules, and voter locations are manipulated.

Keywords
Political economy; redistribution; democratic politics

1. Introduction
This paper offers some formal theoretic evidence of the importance of electoral geography, and accounts for two stylized facts that do not fit easily with our current understanding of the implications of electoral rules:

1. Proportional representation (PR) electoral rules are not always associated with more generous social spending. In some cases, we observe comparatively high levels of social spending in majoritarian single-member district (SMD) systems.¹
2. National two-party competition rarely occurs, even under SMD rules.²

Previous studies of redistributive politics have focused on the incentive structures created by either pure SMD or nationwide PR, and assume either fully integrated populations or populations that are perfectly segregated across districts (e.g. Iversen and Soskice, 2006; Lizzeri and Persisco, 2003; Persson and Tabellini, 2000; Persson et al., 2007). My

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analysis considers, at least conceptually, all possible combinations of lines, rules, and locations. Once one does that, the effect of moving from SMD to various kinds of PR (not just nationwide) can have quite diverse impacts on a group’s representation in the legislature. Here, I focus on the geographic distribution of low-income citizens and show that the usual relationship between electoral rules and social spending (that PR leads to more generous social spending) holds only when electoral geography is ignored. I show that, under some conditions, the poor will do better when elections are contested in SMDs, compared to PR rules.

2. Electoral politics and redistribution

Following Iversen and Soskice (2006; see also Acemoglu and Robinson, 2006; Persson and 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 SMD or multi-member district (MMD) PR electoral rules. Finally, governments are formed, and the governing party or coalition implements its most preferred policies perfectly. This simple model provides the basis of formal analytic examples that will illustrate the importance of electoral geography. Before introducing different income and legislative seat distributions, the next few sections will make explicit assumptions about voter preferences and party strategies.

2.1. Citizens

Suppose that there are three types of citizen, defined by their income: there are low-income citizens (L), middle-income citizens (M), and high-income citizens (H). Let yj denote earnings income, and assume

\[ y_L < y_M < y_H \] (1)

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

\[ V_j(p_j) = y_j - T_j + B_j = y_j + p_j \] (2)

Here, \( T_j \) reports lump-sum taxes assessed for each citizen type, and \( B_j \) reports any benefits that are distributed to citizens of type \( j \); \( p_j \) 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 (for the moment) that there are no costs or benefits associated with office-holding. Parties campaign in the election stage by proposing a redistributive policy, in the form of vectors, \( P = (p_L, p_M, p_H) \), that describe net transfers to each group of citizens. Following Iversen and Soskice (2006), proposals are...
subject to several constraints: first, assume that for each income group, there exists a taxation capacity, $\bar{T}_j < y_j$, and that no group is taxed at a rate beyond this capacity. That is,

$$p_j \geq -\bar{T}_j \text{ for all } j$$  \hspace{1cm} (3)$$

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

$$0 = \bar{T}_L < \bar{T}_M < \bar{T}_H$$  \hspace{1cm} (4)$$

Notice that equation (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 amount to be redistributed is equal to the sum

$$\bar{T} \equiv \bar{T}_H + \bar{T}_M$$  \hspace{1cm} (5)$$

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

$$p_L \geq p_M \geq p_H$$  \hspace{1cm} (6)$$

Iversen and Soskice (2006) note that this non-regressivity assumption is weaker than similar assumptions typically made in formal analysis of tax-and-transfer policies (Meltzer and Richard, 1981; Romer, 1975), and is empirically well supported in contemporary democracies (see 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, for example, is rarely viable.

### 2.3. Forming government

Parties that can form the government independently will implement their most preferred policies. Let the policy vectors $P^*_i$ for each $i \in \{L, M, H\}$ denote each (income group and) party’s most preferred redistributive policies, subject to the non-regressivity and balanced budget constraints described above (i.e. equations (5) and (6)):

$$P^*_L = (\bar{T}_M + \bar{T}_H, -\bar{T}_M, -\bar{T}_H)$$  \hspace{1cm} (7)$$

$$P^*_M = (\frac{\bar{T}_H}{2}, \frac{\bar{T}_H}{2}, -\bar{T}_H)$$

$$P^*_H = (0, 0, 0)$$

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, without bearing any tax burden themselves; the non-regressivity constraint implies that middle-income citizens will do best when they split their tax receipts equally with the poor. Finally, no redistribution is the optimal outcome for high-income citizens.\(^4\)
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 and 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, $P_{jk}^*$, when party $j$ is the formateur:

$$P_{LM}^* = \left( \frac{T_M + T_H}{2}, \frac{T_H - T_M}{2}, -T_H \right)$$

$$P_{HM}^* = \left( \frac{T_H - T_M}{3}, \frac{T_H - T_M}{3}, 2(\frac{T_M - T_H}{3}) \right)$$, and

$$P_{LH}^* = \begin{cases} \left( \frac{T_M + T_H}{2}, -T_M, \frac{T_M - T_H}{2} \right) & \text{if } -T_M \geq \frac{T_M - T_H}{2} \text{ or } T_M \leq \frac{T_H}{3} \\ \left( \frac{2T_H}{3}, -\frac{T_H}{3}, -\frac{T_H}{3} \right) & \text{otherwise} \end{cases}$$

As Iversen and Soskice (2006, Proposition II) demonstrate, these cases are exhaustive: given the opportunity to be the formateur, high-income citizens strictly prefer a coalition with middle-income citizens over a coalition with low-income citizens. However, when $M$ is the formateur, middle-income citizens have more to gain from an $M-L$ coalition than from an $M-H$ coalition. Finally, low-income citizens weakly prefer the policy resulting from an $L-M$ 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 vote for a party (i.e. voting by type), when ballots cast in favor of a different party (‘strategic voting’) can result in a more favorable redistributive policy.

Notice that policy outcomes are fully anticipated by the governing party or coalition: In equilibrium, parties 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 equation (8). As a consequence, parties have no incentive to moderate their policies during the campaign period because 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 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 anticipation of the governing party or coalition, listed in the first column. The cells of the table report citizen voting strategies as a result of these expectations. For example,
Table 1. Citizen voting strategies. This reports citizen voting rules for each group of citizens, in anticipation of majority governments formed by each party and each viable coalition, when each income groups vote sincerely. In each coalition J-K, party J is the formateur. Cell entries report which party each citizen type will vote for, in anticipation of a government formed by the party or coalition listed by row headings.

<table>
<thead>
<tr>
<th>Expected governing party or coalition</th>
<th>Voting rule</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>L</td>
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<td>L</td>
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<td>M</td>
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<td>H</td>
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<td>L-M, M-L</td>
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<td>L-H</td>
<td>L</td>
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<tr>
<td>H-M</td>
<td>M</td>
</tr>
</tbody>
</table>

reading across the top row of Table 1, in expectation of a majority government formed by the low-income citizens’ party (L), low- and high-income citizens will vote by type, and middle-income will vote strategically for high-income citizens’ party (H). Notice that, in fact, both low- and middle-income citizens sometimes have incentives to vote strategically for parties other than that party that best represents their policy preferences: first, as illustrated above, in expectation of an L government, middle-income citizens may be able to 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, low-income citizens have strong incentives to vote strategically for M, and may be able to secure a more favorable outcome. Low-income citizens face similar incentives in anticipation of an 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 low-income citizens. Finally, in anticipation of an L-H coalition, middle-income citizens have 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 middle-income citizens’ support of H does not allow H to form the government independently, or act 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.5

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. 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 turn out than high-income citizens. Then, let $\pi_i$ define the proportion of voters of type $i$ in the electorate:

$$\pi_L < \pi_M < \pi_H$$

(9)

In this analysis, this ‘turnout bias’ is minimal and this assumption will operate as a tie-breaking rule. Nevertheless, as we shall see, the implications of even minimal turnout bias are especially important in plurality elections contested in heterogeneous districts.

To introduce electoral geography, 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 region 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 $\pi_U^j$, $\pi_R^j$, and $\pi_S^j$, for $j = L$, $M$, and $R$, respectively. National income distributions can then be characterized by their 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, equation (9) characterizes both the national electorate and the electorate of every district of this first country case. Districts, in this case, are said to be ‘heterogeneous’.

**Country R. Rural poverty.** Suppose that income is positively correlated with population density, such that, although equation (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:

$$\pi_H^U > \pi_L^U > \pi_M^U$$

$$\pi_S^S > \pi_L^S > \pi_H^S$$

$$\pi_R^R > \pi_H^R > \pi_M^R$$

(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 equation (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:

\[
\pi_U^L > \pi_U^H > \pi_U^M
\]

\[
\pi_S^U > \pi_S^L > \pi_S^M
\]

\[
\pi_R^U > \pi_R^M > \pi_R^L
\]

(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 density regions in approximately equal proportions, but with somewhat more citizens living in ‘suburban’ or medium-density areas, and slightly fewer citizens living in rural or low-density areas. Although the terms urban, rural, and suburban provide a useful framework for this analysis, they are not intended convey any substantive meaning beyond population density.

Of course, the geographic distribution of voter types is only one component of electoral geography. Legislative seats must also be distributed across electoral districts. Figure 1 depicts the geographic distribution of voters, with each labeled area corresponding to 1/15 of the population. Thus, in each country, as described just above, one-third of the population resides in urban areas, denoted by \(U_d\), 6/15 reside in suburban areas, denoted by \(S_{dd}\), and 4/15 reside in rural areas, denoted \(R_d\). 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:

**Assembly S. SMDs.** All elections to the 15-member legislature are contested by plurality rules in SMDs.

**Assembly N. National MMD.** All candidates contest the election in a single, nationwide district, and seats are allocated according to a largest remainder PR rule (i.e. a Droop quota).

**Assembly V. Varying-MMDs.** 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 suburban districts, and four members are elected in rural SMDs. Seats are allocated according to a largest remainder rule.
Figure 1. District structure under different electoral rules: the structure of the electoral districts of Assemblies S (denoted by dotted lines), N (denoted by the dashed line), and V (denoted by solid lines). $U_d$, $S_{dd}$, and $R_d$ denote legislators elected in urban, suburban, and rural areas, respectively.
Note that assemblies S, N, and V vary on 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 and 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 in the construction of MMDs in assemblies N and V can generate divergent redistributive outcomes.

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 rephrasing 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 offers a general discussion of the four outcomes identified for the set of nine cases (three countries, three sets of electoral rules), and leaves the technical details of the equilibrium analysis for Appendix A.

The earlier discussion of voter strategies anticipates the set of outcomes observed across this set of analytic examples. Governments are formed by:

1. The low-income citizens’ party, L, when the electoral geography allows low-income voters to elect the majority of seats in the legislature. This outcome occurs when elections are contested in MMDs, and low-income citizens elect candidates in both urban and rural districts (i.e., Assembly V, Country R). Here, low-income citizens benefit from the disproportionality of the low district-magnitude of rural districts.

2. A coalition of the low- and middle-income citizens’ parties, L-M. This most frequent outcome occurs when, together, the members of the low- and middle-income citizens’ parties hold a majority of seats in the legislature, and the electoral geography prevents high-income citizens from securing a better outcome by voting strategically. Importantly, the L-M coalition is observed under both PR and SMD electoral rules: the L-M coalition governs when elections are contested in single, nationwide districts (Assembly N), and when elections are contested in SMDs, and low-income citizens are geographically concentrated in either rural or urban districts.

3. The middle-income citizens’ party, M, which occurs when low-income citizens have incentives to vote strategically for the middle-income citizens’ party, and can thereby avoid a government formed by the high-income citizens’ party. This outcome occurs when elections are contested in heterogeneous SMDs and MMDs (i.e. in Country E).

4. The high-income citizens’ party, H. This least favorable outcome for low-income citizens occurs when the electoral geography favors the representation of high-income citizens (i.e. they are over-represented in the low-district-magnitude rural districts) and prevents low-income citizens from undermining this advantage by voting strategically for the party that represents the interests of middle-income citizens (Assembly V, in Country U, and also in cases with extreme turnout bias).
Figure 2. First, most previous analyses compare policy outcomes under different electoral rules: Assembly V (solid line), Assembly N (dotted line), and Assembly S (dashed line), under different assumptions about the geographic distribution of income groups. The horizontal axes report the ratio of rural low-income citizens to urban low-income citizens. The case labeled ‘R’, for example, corresponds to the case of ‘rural poverty’, or when low-income citizens are over-represented in rural districts.

To examine the comparative implications of electoral geography more completely, it is helpful to suppose that cross-national differences can be summarized by an electoral concentration ratio, $\pi^R_L / \pi^U_L$, which 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 one 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 of 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 Figure 2. The vertical axis reports $p_L$, or the distribution to low-income citizens for each set of electoral rules, for each country.15

Notice that the important modifying effect of the geographic concentration of low-income citizens is quite clear: first, that much of the previous literature compares policy outcomes in national MMDs and SMDs, which correspond to points A and A’ in Figure...
2. 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 general claim that MMDs and PR rules create incentives for more extensive redistributive policy is less informative. For example, when low-income citizens are evenly distributed and district magnitude varies, SMD rules yield the same policy outcomes as elections contested in national MMDs. (Point A’ in Figure 2 also corresponds to distributions of low-income citizens when elections are contested under the rules of Assembly V). Points B and C indicate that the same redistributive outcome can be achieved under SMD and national MMD electoral rules, when low-income citizens are sufficiently geographically concentrated: an outcome that directly challenges general claims about lower spending under SMD electoral rules. Moreover, notice that the usual comparative relationship between SMDs and MMDs, and redistributive spending is reversed when low-income citizens are concentrated in urban regions (points C and C’): elections held under SMD rules yield more extensive redistributive policy than elections held under MMDs of varying sizes. Finally, note that it is only when low-income citizens are concentrated in rural regions (Country R), and elections are contested in varying-magnitude MMDs (though not in national MMDs), policy is perfectly responsive to low-income citizens.

The summary presented in Figure 2 draws attention to several further empirical implications resulting from this analysis. Here, I concentrate on three implications that are unanticipated by previous work: first, when low-income citizens are geographically concentrated, a change from MMD to SMD electoral rules can create incentives for more generous redistributive spending. Similarly, 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. Finally, 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.

5. The implications of electoral geography for party competition

In a very straightforward modification of the model presented above, we can evaluate the implications of electoral geography for the structure of party competition under each set of electoral rules. Suppose, for example, that parties must bare (fixed and equal) costs associated with contesting the election, but that these costs are fully covered by the benefits of having even a single cast in its favor (e.g. perhaps achieving ‘official party status’). Under which conditions will the low-income people’s party, L, have an incentive to stand for election?

The geographic distribution of income groups, and especially low-income voters, importantly determines the structure of party competition. When elections are contested under varying-MMD rules (Assembly V), and low-income voters are concentrated in either rural or urban areas, the low-income party will face incentives to contest the election; these incentives are absent when there is no geographic concentration of low-income
voters. The geographic concentration of low-income voters in either rural or urban areas creates incentives for the low-income people’s party to contest the election even when elections are contested under SMD rules. This result, of course, contradicts Duverger’s law, but is consistent with much of the empirical analysis of party competition under SMD rules (see e.g. Gudgin and Taylor, 1979; Johnston and Pattie, 2006).

Remember, however, that when elections are contested in perfectly heterogenous districts (Country E), under SMD (or varying-MMD) rules, low-income voters will vote strategically for the party that represents the preferences of middle-income voters best, M: otherwise, because of the turnout bias, the party that represents high-income citizens can expect to form the government, and implement the policy low-income voters least prefer. As a consequence, if there are costs associated with contesting the election, the low-income people’s party will not expect to win even a single vote, and will have no incentive to contest the election. Therefore, under SMD electoral rules, with heterogeneous districts and turnout bias (the under-representation of low-income voters in the electorate), electoral competition will be between two parties, and neither party will face incentives to modify their policies to be responsive to the poor. Importantly, two-party competition under SMD rules need not be assumed, but can result from a simple model of redistributive politics that takes electoral geography into account.

6. Caveats

Beyond the imagined legislative district structures, this analysis makes several assumptions that are especially important for understanding the implications of the series of formal analytic examples.

**Income groups are well defined, and equal proportions of the population.** Of course, income is more generally and appropriately thought of as a continuous variable, and there is some evidence that the structure of inequality (whether middle-income voters see themselves as more closely aligned to low- or high-income voters) shapes voter preferences for redistributive policy in important ways (Lupu and Pontusson, 2011). Here, as in the earlier models on which this analysis builds, treating income as a categorical measure and income groups as equal shares of the population offers important analytic advantages: discrepancies in the income groups’ vote-to-seat mappings, for example, are obvious. Altering the relative sizes of the income groups would have similar effects to the manipulation of the turnout bias assumption.

**Turnout increases with income, or high-income citizens are over-represented in the electorate, compared to middle- and low-income citizens.** As suggested earlier, this assumption operates as a tie-breaking rule, but has important implications for the social policy and governments that result in equilibrium. If this feature of the analysis were to be excluded, only elections in Country E (with the even distribution of voter types) would be affected. In combination with the ‘equal proportions’ assumption, an alternate specification that, for example, would allow for the random selection of winners is needed. In essence, a random tie-breaking rule under SMD or varying-MMD rules would lead to the same results as national-MMD electoral rules: each party can expect to win one-third of the seats in the SMD or varying-MMD legislature. Importantly, excluding the turnout bias assumption when elections are contested in heterogenous SMDs or varying-MMDs results in policy expectations that are indistinguishable from those
that would be derived under national-MMD rules. This is further evidence that MMD electoral rules do not always lead to more generous redistributive policy.

Now suppose, instead, that rates of voter turnout decreased with income, and low-income voters outnumbered middle and high-income voters in the electorate. Again, only elections contested in Country E are affected. Notice, however, that low-income voters can expect policy outcomes that are no more generous than the original results, in which the government was formed by the party that represents the interests of middle-income citizens. Now, middle-income citizens face incentives to vote strategically for the party that represents the interests of high-income citizens (rather than suffer a government formed by the low-income people’s party). As long as low-income citizens do not comprise more than half of the electorate, the high-income peoples’ party will form the government, and implement its most preferred policy. If there are costs to contesting the election, again, electoral competition will be dominated by two parties: in this case, which is similar to what Iversen and Soskice (2006) find for SMD elections, the low- and high-income peoples’ parties will stand for election, and the middle-income voters will be pivotal. Notice, however, that this outcome does not require an explicit electoral coalition between middle-income, and low- and high-income citizens, and no assumption of two-party competition under SMD rules is necessary.

Citizens only have preferences about redistributive policy. This assumption restricts the nature of electoral and governing alliances, and ensures that income groups vote as blocs. The interesting case of how a second dimension of party competition alters the implications of this analysis, particularly if the second dimension is correlated with population density (i.e. it distinguishes the preferences of rural and urban voters), is a topic for future research.

7. Conclusion

Using a series of formal analytic examples, based on a simple model of electoral politics, this paper has explored some important implications of electoral geography and challenges two generally held conclusions about the relationship between electoral politics and social spending: first, SMD electoral rules can sometimes lead to social spending that is at least as generous as the social spending that results from PR rules. How, then, can the empirical relationship between MMD electoral rules and social spending be accounted for (e.g. Iversen and Soskice, 2006; Alesina and Glaeser, 2004; Persson and Tabellini, 2003)? What might this analysis suggest about the electoral geography of countries with MMD electoral rules? We ought to find few MMD countries in which low-income citizens are over-represented in urban districts. Similarly, when elections are contested under SMD rules, more generous social spending should be associated with systems with less equitable distributions of low-income voters.

With the incorporation of electoral geography, this paper also offers new insight to our understanding of party competition under SMD rules: when voters are not evenly distributed across electoral districts, we might reasonably expect multi-party competition under SMD electoral rules. In this analysis, two-party competition results only when there is an even distribution of voter types across electoral districts, and turnout bias undermines the equitable representation of low-income voters in the electorate. This creates incentives for low-income voters to vote strategically for the middle-income people’s party, but without creating incentives for the middle-income people’s party to be responsive to the poor.
Appendix. Equilibrium analysis

In the formal analytic examples that were presented in the main body of this discussion, equilibrium strategy profiles consist of a set of policy proposals, one for each party, and the voting decisions of each income group of voters. Voters know the geographic distribution of different income groups, and can fully anticipate which party or coalition will form the government and the policies they will implement. As a consequence, voters will either vote by type, or vote strategically for the party that will ensure an optimal policy outcome. With no ability to commit to modified policy proposals, parties will propose either their most preferred policy or the policy that will yield the coalition that is optimal from the perspective of the voters they represent.

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, M-L) (see Iversen and Soskice, 2006), which will implement the compromise policy, $P = P^{*}_{LM}$. No income group can improve this outcome by voting strategically; all voters vote by type.17

Policy outcomes in Country E

When elections are contested in SMDs (i.e. under the rules of Assembly S), there are slightly more high-income voters than either middle- or low-income voters. If all citizens vote by type, H will win in every district, and implement its most preferred policy, $P = P^{*}_{H}$, in which no redistribution occurs. In anticipation of this outcome, low-income citizens will vote strategically for M, the party that represents middle-income citizens: low-income citizens strictly prefer the policy proposed by M to that which 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, $P = P^{*}_{M}$. 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.18

When elections are contested in MMDs of varying sizes, and seats are allocated according to a PR rule (Assembly V), even a limited amount of turnout bias can create an enormous advantage for H. In this example, 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. Low-income citizens, however, can significantly improve policy outcomes by voting strategically for M, which will then be supported by approximately two-thirds of each district. With the support of low-income citizens, 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 its policy; all parties propose their most preferred policies, \( P_L^*, P_M^*, \) and \( P_H^* \).

**Policy outcomes in Country R**

When elections are contested in SMDs (Assembly S), and 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, \( P_{LM}^* \). High-income voters 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. Thus, parties L and M will propose the compromise policy, \( P_{LM}^* \), H will propose its most preferred policy, \( P_H^* \), and all income groups vote by type.

Assessing the electoral outcome when elections are contested in varying-magnitude MMDs (Assembly V), is more challenging: there are many different geographic allocations of citizen types that satisfy the criteria listed above, in equation (10). However, the allocation of seats within each district is more limited. To estimate the most likely distribution of seats, I assembled a data-set that includes all (two-decimal-place) income-group allocations that jointly satisfy equations (9) and (10) \((n = 230,139)\). Seats were then allocated to each party, using the Droop quota seat allocation rule. 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). In anticipation of this outcome, all parties propose their most preferred policies, and all voters vote by type.\(^{19}\) With a solid majority of the seats, L forms the government and implements \( P = P_L^* \), without compromise.\(^{20}\)

**Policy outcomes in Country U**

When elections are contested in SMDs (Assembly S), in Country U, if all citizens vote by type, L can expect to win five urban seats, M will win the six 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, \( P_{ML}^* \). Further, high-income voters cannot improve this policy outcome by voting strategically for M.

Again, there are many different allocations of voters that meet the criteria described in equations (9) and (11), and complicate the allocation of seats when elections are contested in varying-magnitude MMDs (Assembly V). Replicating the analysis for Country R, described above, 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.\(^{21}\) H can form the government independently, and implement \( P = P_H^* \). 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. Thus, all income groups vote by type, and all parties campaign on their most preferred policies, $P_{L}^{*}$, $P_{M}^{*}$, and $P_{H}^{*}$.

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**Notes**

1. As a proportion of GDP, France spends more on social programs than Belgium, Denmark, and Sweden, for example (OECD, 2013).
2. Although Duverger (1954) classic treatment leads us to expect that ‘the simple-majority single-ballot system favors the two-party system’ most SMD systems include three or more parties that compete in national elections. Cox and Amorim (1997), for example, report an average of 2.7 (vote-weighted) parties in their sample of SMD systems. Similarly, Iversen and Soskice (2006) find a (seat-weighted) average of 2.5 parties in the majoritarian systems included in their analysis. Among developed democracies, only the US supports a two-party system.
3. Iversen and Soskice (2006) provide a convenient framework and benchmark; the important features of their analysis are the sequence of events, the progressivity of income group preferences over a single policy dimension, the non-regressivity of policy benefits, and the nature of coalition formation (i.e. via a Rubinstein bargaining process). Nevertheless, this analysis departs from Iversen and Soskice (2006), and other now-standard models of redistributive politics (see Persson and Tabellini, 2000) in important ways, namely the explicit treatment of electoral geography.
4. These preferences generally reflect current empirical work about the relationship between income and attitudes about redistributive policy. Corneo and Gruner (2002), for example, find a linear relationship between an individual’s relative income, and their expectations about whether they are likely to benefit, and their support for redistributive policy.
5. Note that a second dimension of party competition is not necessary to sustain an $L-H$ coalition.
6. The under-representation of low-income citizens in the electorate is well established empirically. See for example Wolfinger and Rosenstone (1980); Nevitte et al. (2009) examine the relationship between socio-economic status and turnout in a broadly comparative analysis of contemporary democracies.
7. Iversen and Soskice (2006) assume, instead, that ‘the voting population is equally divided between the three groups’.
8. 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 outnumbered 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.
9. Rates of turnout among different income groups are probably endogenous to the electoral success of each party; this topic is explored in a separate paper by the author.
10. Although poverty can be very concentrated in the US, congressional districts are large enough (i.e. more than 700,000) that Country E is a good approximation of the heterogeneous distribution of income across American electoral districts. For example, an average of 12% of individuals, and never a majority, live with incomes below the national poverty line, in each congressional district (US Census, 2000). Of course, the national poverty threshold is quite a bit less than the 33rd percentile of the national income, implied by this analytic example: Jusko (2008) finds that even with a threshold that is closer the 33rd percentile, low-income citizens are rarely the majority in any congressional district.

11. In fact, this distribution of low-income citizens characterizes Denmark, Finland, and Sweden (Jusko, 2008).

12. The distribution of income in Country U approximates contemporary England (Dorling et al., 2007).

13. This overall distribution of population across urban, mixed, and rural regions is intended to reflect the current distribution of population in contemporary democracies: for example, according to the European Union (2010), about 35% of French citizens reside in ‘predominantly urban’ regions, 29% reside in ‘predominantly rural’ regions, and 36% reside in ‘intermediate’ regions. In other contemporary democracies, the populations are less evenly distributed, but reflect a similar pattern: in Canada, about 35% of citizens reside in Toronto, Montreal, and Vancouver; an additional 46% reside in other ‘urban’, but less populated places, and 19% live in rural areas (Statistics Canada, 2013). In the US, 24% of the population lives in cities with populations larger than five million, while about 60% live in smaller ‘metro’ areas (Wilson et al., 2012). In several European countries (especially Belgium, the Netherlands, and the United Kingdom), more citizens live in urban areas: among the EU-27 countries, an average of 40% of citizens reside in ‘predominantly urban regions’, while 35% reside in ‘intermediate’ places (European Union, 2010). Finally, in a few countries (Austria and Finland), and especially Ireland, rural populations represent larger proportions of the national population. The European Union (2010) reports that as many as 71% of Irish citizens reside in ‘predominantly rural’ regions.

14. 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. Boix, 2003; Cusack et al., 2007; Iversen and Soskice, 2009). 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.

15. 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.

16. Monroe and Rose (2002) anticipate this result: MMD rules dilute the electoral strength that comes with geographic concentration of interests shared by city dwellers.

17. An anonymous reviewer for an earlier version of this paper pointed out that the expected policy (based on the expectation of an L-M coalition two-thirds of the time, and an H-M coalition otherwise),

\[ E(P) = \left( \frac{2T_M + 4T_H}{9}, \frac{4T_H - 4T_M}{9}, \frac{2T_M - 8T_H}{9} \right) \]

rather than the modal policy outcome, should structure voter decision-making. If

\[ \frac{T_M}{2} < \frac{T_H}{9} \]
(i.e. if $\overline{T}_M$ is very low), low-income voters will strictly prefer a government formed by the middle-income peoples’ party. In fact, this modification leads to policy outcomes which are less generous than those that result under SMD electoral rules in systems with rural and urban concentrations of poverty! For consistency with the previous literature, this discussion maintains the slightly more generous modal policy outcome as the expected result for elections contested under national-MMD rules.

18. This outcome, of course, is quite different from what Iversen and Soskice (2006) find: Iversen and 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.

19. 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.

20. 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 equation (8).

21. 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 $M$.

References


