Office-Holding Premia and Representative Democracy*

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Abstract

I show that in a representative democracy, high-income citizens predominating in the legislature may imply that no legislator supports low-income citizens' preferred redistribution policy. Provided redistribution is the salient policy issue, high-income citizens cannot predominate in the legislature if low-income citizens still support more redistribution once in office. Low-income citizens in office must join high-income citizens in opposing more redistribution. I formalize the underlying logic using office-holding premia. If high-income citizens predominate the legislature, then high office-holding premia must induce low-income citizens to oppose more redistribution once in office. Therefore, all legislators oppose more redistribution, irrespective of their income background.

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1 Introduction

High-income and affluent citizens predominate the legislatures in many representative democracies (e.g., Carnes 2012; Gagliarducci et al. 2010; Peichl et al. 2013; Dal Bó et al. 2017).[1] A natural question thus is how salient the policy preferences of low-income citizens are in the policy-making process in representative democracies. This question is open. Some argue that low-income citizens' policy preferences are underrepresented (e.g., Gilens 2005, 2009; Carnes 2012; Peters and Ensink 2015), while others disagree (e.g., Soroka and Wlezien 2008; Ura and Ellis 2008; Kelly and Enns 2010; Branham et al. 2017). This question is important. Many major policy issues have an inherent redistributional component—from tax progressivity and welfare spending to public education and health care (e.g., Besley and Coate 1991; Boadway and Marchand 1995)—and low-income citizens prefer more redistribution than high-income citizens (e.g., Corneo and Grüner 2002; Durante et al. 2014).

This paper contributes to this ongoing debate by pointing to an implication of the predominance of high-income citizens in the legislature under certain conditions. Specifically, I ask what role the redistribution preferences of low-income citizens play in the policy-making process. I show that, provided redistribution is the salient policy issue, the predominance of high-income citizens may imply that not one legislator, regardless of their high- or low-income background, supports the redistribution policy low-income citizens prefer. The redistribution preferences of low-income citizens might thus play no role in the policy-making process at all.

The logic underlying this implication rests on three facts. First, low-income citizens—those with less-than-average income—constitute the majority in most electoral districts.[2] Second, low-income citizens prefer more redistribution than high-income citizens (e.g., Corneo and Grüner 2002; Durante et al. 2014). Third, legislators tend to vote according to their personal policy preferences (e.g., Levitt 1996; Lee et al. 2004; Matsusaka 2017). Given these facts, suppose that redistribution is the salient policy issue and all citizens can vote and run for office.[3] Then, low-income citizens and thus the majority of voters in most districts vote for candidates who support more redistribution once in office. Hence, if in contrast to high-income

[1]For example, over 95% of the members of the 115th United States Congress held at least a bachelor's degree, and over 60% held degrees beyond that (Manning 2018), signaling high income potential. At the same time, only about 30% of the overall US population aged 25 and over held at least a bachelor's degree. As to affluence, by some estimates, the median net worth among members of Congress in 2013 was over $1 million—more than 18 times that year's median net worth among US households of under $60,000. Education data: United States Census Bureau, 2012–2016 American Community Survey 5-year estimates, accessed on 9/25/2018. Wealth data: Center for Responsive Politics, accessed at `https://www.opensecrets.org/news/2015/01/one-member-of-congress-18-american-households-lawmakers-personal-finances-far-from-average/` on 9/24/2018.

[2]For example, in all and in over 89% of all congressional districts for the 115th United States Congress, respectively, the median household income is less than the mean household income in the district and in the United States overall. Data: United States Census Bureau, 2012–2016 American Community Survey 5-year estimates, in 2016 inflation-adjusted US dollars, accessed on 4/20/2018.

[3]That is, there are no wealth, property, or education qualifications. I discuss campaign costs in Section 3.8. I provide justification for both stated assumptions more generally in the first paragraph of Section 4.

citizens, low-income citizens still support more redistribution once in office, then they win most seats in the legislature. Therefore, if high-income citizens predominate in the legislature, then it must be the case that low-income citizens also oppose more redistribution once in office. Thus, all legislators oppose more redistribution, irrespective of their income background.

I formalize this logic in an environment that is consistent with the fact that in many democratic societies, holding office pays a premium over the market income citizens can expect (e.g., Gagliarducci et al. 2010; Eggers and Hainmueller 2009; Peichl et al. 2013; Kotakorpi et al. 2017; Berg 2020). This office-holding premium may capture, for example, high legislator salaries, outside income while in office, and increased income potential in a future post-legislature career. I provide a detailed discussion and possible interpretations in Section 4.1.

In this environment, citizens reside in one of a finite number of electoral districts. In most districts, low-income citizens constitute the majority. They support more redistribution, while high-income citizens oppose it. Redistribution is the salient policy issue. The redistribution policy is chosen by a legislature composed of district representatives. Each representative is determined in an election among two candidates who are selected by two parties from the district's residents. Representatives pocket a premium over their market income as determined by the political institutions and vote for their preferred policy. To the extent that high income is associated with high ability, high-income citizens in office may contribute to additional benefits to all citizens, which may give high-income candidates an electoral advantage.

The main result is that if high-income citizens predominate in the legislature in equilibrium, then no legislator supports more redistribution. If high-income citizens predominate in the legislature, then high enough office-holding premia must induce low-income citizens to also oppose more redistribution once in office. Hence, if high-income citizens predominate in the legislature, then regardless of whether they have a high- or low-income background, all legislators oppose the redistribution policy preferred by low-income citizens. This conclusion is valid even in the case in which high-income citizens have an electoral advantage due to their potential contribution to additional benefits to voters. Because redistribution is the salient policy issue, these additional benefits cannot fully compensate low-income citizens for too little redistribution. Low-income citizens still win the majority of seats if they support more redistribution once in office. If high-income citizens predominate in the legislature, then it must thus still be the case that low-income citizens oppose more redistribution once in office.

The underlying logic is quite robust. It carries over to a number of extensions of the basic environment. I respectively allow for a sense of group identity; reelection concerns; a second policy dimension that is independent of income; and a role for campaign costs, campaign finance, and special interests. In all these extended environments, the main result holds: if high-income citizens predominate in the legislature, then no legislator supports more redistribution. The intuition is unchanged. If low-income citizens for whatever reason still support more redistribution once in office, then they win most seats in the legislature.

In the model, citizen-candidates cannot commit to a policy, and their preferred policy may change with their circumstances. However, I do not assume that office-holding premia are so high that legislators from all backgrounds turn rich in office and therefore oppose more redistribution. While the environment incorporates office-holding premia, in principle, these premia could be very low or even zero. I effectively use the fact that high-income citizens predominate in the legislature to discipline the equilibrium predictions and to identify the relevant subset of the parameter space. In that relevant subset, office-holding premia are high enough to induce citizens from all backgrounds to oppose more redistribution once in office.

I assume throughout that legislators vote as if their vote decided the policy outcome. Thus, naturally, the policy I say a legislator supports is the policy they would vote for if their vote was pivotal. The results thus concern what legislators would do if their vote was pivotal rather than interpretations of their public statements or publicly recorded individual voting behavior. Public statements and publicly recorded votes might involve strategic interactions and messaging to voters, especially when they do not affect the payoff-relevant policy outcome.

The point of this paper is that under certain conditions, the observed predominance of high-income citizens among legislators requires that low-income citizens also oppose more redistribution once in office. Given the channel I explore, high office-holding premia induce low-income citizen to oppose more redistribution once in office. However, office-holding premia are merely one of possibly many suitable channels to formalize the underlying logic. For example, during lengthy campaigns, candidates have many aids at their service and interact with celebrities and rich donors. One could imagine that this experience may instill a sense of status and belonging with the "rich and famous" in low-income candidates, in which case they oppose more redistribution once in office due to an altered group identity. If low-income citizens do not develop this sense of status during their campaign, then they still support more redistribution once in office and win the majority of seats in the legislature. Thus, high-income citizens can only predominate among legislators if low-income citizens develop this sense of status and oppose more redistribution once in office. That is, if high-income citizens predominate in the legislature, then no legislator supports more redistribution.

Related Literature This paper contributes to the active debate about the salience of low-income citizens' policy preferences in the policy-making process in representative democracies (e.g., Gilens 2005; Soroka and Wlezien 2008; Ura and Ellis 2008; Gilens 2009; Kelly and Enns 2010; Carnes 2012; Brunner et al. 2013; Gilens and Page 2014; Peters and Ensink 2015; Branham et al. 2017). I focus on preferences for redistribution when redistribution is the salient policy issue. I show that the predominance of high-income citizens among legislators may imply that all legislators from all backgrounds oppose more redistribution. Low-income citizens' redistribution preferences might thus play no role in the policy-making process.

While the policy issue is redistribution (e.g., Meltzer and Richard 1981), given the focus on legislature composition, this paper is most closely related to the literature on political selection. I study a citizen-candidate environment (Osborne and Slivinski 1996; Besley and Coate 1997) with opportunistic parties and an income premium associated with holding office. Focusing on politician quality, ability, or valence, Carrillo and Mariotti (2001), Galasso and Nannicini (2011), Mattozzi and Merlo (2015), and others study the selection of political candidates by parties. Similarly, for example, Caselli and Morelli (2004), Messner and Polborn (2004), and Poutvaara and Takalo (2007) study the role of politician pay in determining the selection of political candidates. None of these papers can speak to the redistribution policies legislators support when high-income citizens predominate in the legislature. The same is true for Chari et al. (1997), Harstad (2010), and Christiansen (2013), who study the role of strategic delegation in determining district representatives in the context of public spending. Mattozzi and Snowberg (2018) focus on the distribution of tax revenues collected from all citizens as local government spending across electoral districts. They assume that the more successful citizens are in the private sector, the better they are at securing resources for their district in the legislative process. If these negotiation skills are important, then all districts elect high-income citizens as their legislators, whose preferences for low taxes lead to low overall government spending. Huber and Ting (2013) study a related channel involving control over the allocation of resources across districts by the majority party. They use this channel to explain poor voters voting for the party that favors less redistribution and rich voters voting for the party that favors higher taxes. By contrast, I focus on the role low-income citizens' redistribution preferences play in the policymaking process, given that high-income citizens predominate in the legislature. I show that if redistribution is the salient policy issue, then the predominance of high-income citizens among legislators may imply that not a single legislator supports the redistribution policy preferred by low-income citizens, irrespective of the composition of the legislature beyond the predominance of high-income citizens. That is, the redistribution preferences of low-income citizens might play no role in the policy-making process at all.

I present the model in Section 2, analyze the equilibrium implications in Section 3, discuss a few modeling choices and interpretations in Section 4, and conclude in Section 5.

2 The Model

There are a unit-measure continuum of risk neutral citizens and two political parties indexed by $P \in \{A, B\}$. A measure $\mu_l > 0$ of citizens belong to the low-income group l. They have market income $w_l > 0$. The remaining measure $\mu_h = 1 - \mu_l > 0$ of citizens belong to the high-income group h. They have finite market income $w_h > w_l$. Average income in society is $\bar{w} = \mu_l w_l + \mu_h w_h$. As in, e.g., the United States, median income is less than mean income, i.e., $\mu_l > \mu_h$. (I discuss the income distribution in Section 4.3.)

Each citizen resides in exactly one of an odd finite number $d > 1$ of pairwise disjoint electoral districts. Districts are indexed by $j \in D = \{1, \ldots, d\}$ and have an equal measure $1/d$ of citizens each. In each district j, the measure of citizens belonging to income group i is $\mu_i^j > 0$, where $\mu_l^j + \mu_h^j = 1/d$ for all $j \in D$ and $\sum_j \mu_i^j = \mu_i$ for all $i \in \{l, h\}$. There are districts with a majority of citizens from the low-income group l, collected in $D_l = \{j \in D : \mu_l^j > \mu_h^j\}$. There may be districts with a majority of citizens from the high-income group h, collected in $D_h = \{j \in D : \mu_l^j < \mu_h^j\}$. In every district, one group is a strict majority: $D = D_l \cup D_h$. As in, e.g., the United States (see Footnote 2), the majority of districts have a majority of citizens from the low-income group l: $|D_l| > |D_h|$. (I discuss this assumption in Section 4.3.)

There is a legislature with d members that chooses policies in a plurality vote. Each legislator represents one electoral district. Each electoral district is represented by one legislator. Each district's representative is determined in a plurality vote election in that district. Every citizen is eligible both to vote and to run for office in a district election if and only if they are a resident of that district. Running for office is costless but requires being a candidate for one of the parties. (I discuss campaign costs in Section 3.8.) For each district, each party selects one candidate from the district's residents. Candidate selections are simultaneous and independent across districts. Parties maximize their expected number of seats in the legislature. (I discuss alternative party objectives in Section 4.2.) Legislators from group i have income γw_i. Holding office pays a premium over their market income, i.e., $\gamma \geq 1$. For simplicity, I assume that the premium as captured by γ is the same for both groups. The implication that $\gamma w_h > \gamma w_l$ captures the idea that, on average, the skills and abilities associated with high-income occupations in the private sector are likely more transferable to politicians' opportunities to, e.g., generate outside income than those associated with less well-paying occupations. However, this assumption is not essential. Letting γ vary by group makes no difference. (I discuss this fact and γ more generally in Section 4.1.)[4]

Society must decide whether or not to enact (more) redistribution. All income is taxed proportionally at rate $t \in \{0, 1\}$, including that of legislators. Every citizen receives a lump sum transfer $\tau \geq 0$, including legislators. The budget must balance. As there are only d legislators, budget balance can be written as $\tau(\mu_l + \mu_h) = t(\mu_l w_l + \mu_h w_h)$ or $\tau = t\bar{w}$. That is, a tax rate t implies a transfer $\tau = t\bar{w}$. A pair (t, τ) can be written as $(t, \tau) = (t, t\bar{w}) = t(1, \bar{w})$. The policy choice can be summarized by $t = 1$ and $t = 0$ representing (more) redistribution and no (not more) redistribution, respectively.[5,6] (I discuss taxation, the policy space, and a trade-off between the size of the pie and its distribution in Section 4.3.)

[4] Nonmonetary benefits from holding office do not affect legislator voting behavior and thus the results.

[5] In a tax policy space $[0, 1]$, the ideal point of every citizen in any role would be either 0 or 1. As long as an equilibrium of the voting game in the legislature in which the majority does not implement their shared ideal point is considered unreasonable and somehow ruled out, the restriction to $\{0, 1\}$ is inconsequential.

[6] If there was a trade-off between the size of the pie and its distribution (e.g., Meltzer and Richard 1981), then redistribution would be implemented with a tax rate less than one. The results would not change materially.

To the extent that high income is associated with high ability, legislators' background may determine how effective the legislative process and the implementation of policies are. The more effective these procedures are, the more smoothly government services or public goods already in place are provided to citizens, which generates additional benefits. The potential for such additional benefits gives high-income citizens an electoral advantage. I capture this idea without modeling a specific channel. In particular, additional benefits $\eta \geq 0$ accrue to all citizens, including legislators, if and only if the majority of legislators are from group h. However, these potential additional benefits from a high-average-ability legislature cannot fully compensate low-income citizens for too little redistribution, i.e., $\eta < \bar{w} - w_l$. This inequality formalizes the assumption that redistribution is the salient policy issue. If $\eta > 0$, then to the extent that the fraction of high-ability citizens among legislators affects citizens' payoffs, this specification is similar to the one in Caselli and Morelli (2004). If $\eta = 0$, then the legislative technology does not require any special skill or ability. One can think of it as aides and expert advisors. (I discuss a public-good interpretation of η in Section 4.3.)

Candidates for office cannot commit to a policy platform. Legislators vote as if their vote was decisive in the legislature. At the district level, voters vote as if their vote was decisive in determining the district's representative and as if that representative's vote and characteristics were decisive in determining the outcome in the legislature. In all elections and individual voting decisions, ties are broken by equal-probability random draws. The environment and the structure of the game are common knowledge.

3 Analysis

In this section, I analyze the environment just described. While the environment should be interpreted as a society facing the decision whether or not to enact more redistribution than is currently in place, I refer to the policy choices as *redistribution* and *no redistribution*. Conforming with the context of this paper, I often refer to legislators voting in favor of and against redistribution in the legislature as *supporting* and *opposing* redistribution, respectively. Because legislators vote as if their vote was decisive, supporting and opposing redistribution here refers to what legislators would do if their vote was pivotal rather than their public statements or voting records. Although the game is sequential in nature, as all voting is mechanical, the only relevant actions are parties' candidate selections. Thus, pure-strategy Nash equilibrium is the appropriate equilibrium concept (see Definition 1 below).

In Section 3.1, I first describe citizens' payoffs and characterize both legislators' mechanical voting behavior and majorities in society. I then describe parties' strategies and payoffs and define an equilibrium. In the following two Sections 3.2 and 3.3, I characterize the equilibrium. I distinguish between two cases: (i) low office-holding premia, $\gamma w_l < \bar{w}$; and (ii) high office-holding premia, $\gamma w_l \geq \bar{w}$. In Section 3.4, I present the main result in Proposition 3. It shows that the predominance of high-income citizens in the legislature implies that no legislator, regardless of whether they have a high- or low-income background, supports the redistribution policy preferred by low-income citizens. In Sections 3.5–3.8, I extend the environment to allow for a sense of group identity; reelection concerns; a second policy dimension; and a role for campaign costs, campaign finance, and special interests, respectively, and show that the main result and thus the logic carries over. Appendix A collects omitted proofs.

3.1 Strategies, Payoffs, Majorities, and Equilibrium

If a majority of legislators support redistribution, then the legislature chooses $t = 1$, and after-tax incomes are equal across citizens. If a majority of legislators oppose redistribution, then the legislature chooses $t = 0$, and after-tax incomes equal before-tax incomes. Citizens from group i who do not hold office have after-tax income $(1-t)w_i + \tau = (1-t)w_i + t\bar{w} \in \{w_i, \bar{w}\}$. Similarly, legislators from group i have after-tax income $(1-t)\gamma w_i + \tau = (1-t)\gamma w_i + t\bar{w} \in \{\gamma w_i, \bar{w}\}$. If the majority of legislators have a high-income background, then $\eta \geq 0$ accrues to all citizens. Let $\chi \in \{0, 1\}$ indicate the background of the majority of legislators, where $\chi = 1$ indicates a high-income background, while $\chi = 0$ indicates a low-income background. Then, the payoffs of citizens from group i who do not hold office are

$$\phi_i(t, \chi) = \begin{cases} \bar{w} + \chi\eta & \text{if } t = 1, \\ w_i + \chi\eta & \text{if } t = 0. \end{cases} \tag{1}$$

Similarly, the payoffs of legislators from group i are

$$\psi_i(t, \chi) = \begin{cases} \bar{w} + \chi\eta & \text{if } t = 1, \\ \gamma w_i + \chi\eta & \text{if } t = 0. \end{cases} \tag{2}$$

As $\gamma \geq 1$, irrespective of the policy t enacted, legislators have at least as high an after-tax income as they would have as a private citizen. Thus, fixing (t, χ), a citizen selected by a party would not want to decline to be a candidate if they had that option.

Legislators vote for the policy t that maximizes their payoff if their vote decides the policy outcome. The policy stance and mechanical voting behavior of legislators from group i thus derives directly from a comparison of the first and second entries in (2).

Lemma 1. *Legislators from group i support (oppose) redistribution if $\gamma w_i < \bar{w}$ ($\gamma w_i \geq \bar{w}$).*

Legislators from the high-income group always oppose redistribution because $\gamma \geq 1$ and $w_h > \bar{w}$ together imply that $\gamma w_h > \bar{w}$. Whether legislators from the low-income group support or oppose redistribution depends on the size of the office-holding premium γ because $\bar{w} > w_l$. The policy preferences of voters from group i similarly follow from a comparison of the first and second entries in (1): from $\bar{w} - w_l > \eta \geq 0$ follows first that $\bar{w} + \eta \geq \bar{w} > w_l + \eta \geq w_l$ and second, as $\mu_l > \mu_h$ implies that $w_h - \bar{w} > \bar{w} - w_l > \eta$, that $w_h + \eta \geq w_h > \bar{w} + \eta \geq \bar{w}$.[7]

Lemma 2. *Low-(High-)income voters prefer redistribution (no redistribution).*

Lemma 2 characterizes voters' policy preferences. Their mechanical voting behavior follows from the available candidates' policy stances, which in turn may depend on the office-holding premium γ. Low-income citizens prefer redistribution. High-income citizens prefer no redistribution. Given that $\mu_l > \mu_h$ and $|D_l| > |D_h|$, both in society and in the majority of districts, the majority of citizens belong to the low-income group and prefer redistribution.

Observation 1. *In society and in the majority of districts, the majority prefers redistribution.*

The parties can select candidates from any income group in each district. Let $s_{P,j} \in \{l, h\}$ indicate the income group from which party $P \in \{A, B\}$ selects its candidate in district $j \in D$. A strategy s_P for party $P \in \{A, B\}$ then is a collection of candidate selections for all districts,

$$s_P = (s_{P,1}, \ldots, s_{P,d}) \in \mathcal{S} \equiv \{l, h\}^d.$$

Letting $-P \in \{A, B\} \backslash \{P\}$, given a profile $(s_{P,j}, s_{-P,j})$ of district-j candidate selections for both parties, $\pi_j(s_{P,j}, s_{-P,j})$ denotes the probability of party $P \in \{A, B\}$ winning the seat in district $j \in D$. Naturally, $\pi_j(s_{-P,j}, s_{P,j}) = 1 - \pi_j(s_{P,j}, s_{-P,j})$. These probabilities are specified below. They are determined by voters' voting behavior, which depends on what policies candidates support once in office, which in turn depends on the office-holding premium. Party P's objective is to maximize its expected number of seats in the legislature,

$$V(s_P, s_{-P}) = \sum_{j \in D} \pi_j(s_{P,j}, s_{-P,j}).$$

Definition 1. *An equilibrium is a strategy profile* $(s_A^*, s_B^*) \in \mathcal{S}^2$ *such that for all* $P \in \{A, B\}$,

$$V(s_P^*, s_{-P}^*) \geq V(s_P, s_{-P}^*) \quad \forall s_P \in \mathcal{S}.$$

That is, given the other party's candidate selections in all districts, neither party can benefit from changing their candidate selection in some district. Finally, I say that an income group is predominant in the legislature if and only if the majority of legislators belong to it.

Definition 2. *A group predominates the legislature iff the majority of legislators are from it.*

3.2 Low Office-Holding Premia

Suppose that the political institutions determining office-holding premia are fairly restrictive, so that $\gamma w_l < \bar{w}$. That is, the income that legislators from the low-income group can generate

[7] As $\mu_l > \mu_h$, $w_h - \bar{w} = w_h - \mu_l w_l - \mu_h w_h = \mu_l(w_h - w_l) > \mu_h(w_h - w_l) = \mu_h w_h - (1 - \mu_l) w_l = \bar{w} - w_l$.

while in office is low enough for them to support redistribution (Lemma 1). Strictly positive office-holding premia, $\gamma > 1$, are entirely consistent with this case. As legislators from the high-income group always oppose redistribution, all legislators from all groups support the policy preferred by citizens in their group (Lemma 2).

If both candidates in a district $j \in D$ are from the same income group, then all voters in the district are indifferent among them and thus randomize. Each candidate is expected to receive the same share of votes, in which case a fair coin decides the election. That is, $\pi_j(y, y) = 1/2$ for all $y \in \{l, h\}$. Suppose that the two candidates in district j are from different income groups. Once in office, the candidate from the low-income group supports redistribution, while the candidate from the high-income group opposes redistribution. As voters mechanically vote as if their vote was decisive in determining the district's representative and as if that representative's vote and characteristics were decisive in determining the outcome in the legislature, they compare the payoff $\bar{w}$ to the payoff $w_i + \eta$. The former is the payoff associated with a majority of legislators from a low-income background leading the legislature to choose redistribution. The latter is the payoff associated with a majority of legislators from a high-income background leading the legislature to choose no redistribution while additional benefits accrue to all citizens. As $\bar{w} > w_l + \eta$ because redistribution is the salient policy issue and $w_h + \eta > \bar{w}$, it follows that voters from each group vote for the candidate from their group. Let $i_j^* \in \{l, h\}$ indicate the majority group in district j; let $-i_j^* \in \{l, h\} \backslash \{i_j^*\}$ indicate the minority group in district j. Then, the probability of party P winning the seat in district j is

$$\pi_j(s_{P,j}, s_{-P,j}) = \begin{cases} 0 & \text{if } (s_{P,j}, s_{-P,j}) = (-i_j^*, i_j^*), \\ \frac{1}{2} & \text{if } (s_{P,j}, s_{-P,j}) \in \{(i_j^*, i_j^*), (-i_j^*, -i_j^*)\}, \\ 1 & \text{if } (s_{P,j}, s_{-P,j}) = (i_j^*, -i_j^*). \end{cases} \tag{3}$$

The probability that party P wins the seat in district j is one if party P's candidate is from the majority group in district j, while party $-P$'s candidate is not; zero if party $-P$'s candidate is from the majority group in district j, while party P's candidate is not; one-half if both parties' candidates are from the same group. Proposition 1 characterizes the unique equilibrium.

Proposition 1. *If $\gamma w_l < \bar{w}$, then there is a unique equilibrium, and all candidates are from their district's majority group.*

As all candidates are from the majority group in their district, all legislators are from the majority group in the district they represent. As the majority of districts have a low-income majority, the majority of legislators have a low-income background. Therefore, high-income citizens do not predominate in the legislature. I collect this implication in a corollary.

Corollary 1. *If $\gamma w_l < \bar{w}$, then low-income citizens predominate the legislature in equilibrium.*

Because redistribution is the salient policy issue, an electoral advantage for high-income citizens due to a potential role in generating additional benefits does not affect the legislature composition. Legislators are from the majority group in their district and support its preferred policy. In this sense, a district's majority finds representation through the elected official. As the majority of the legislators support redistribution, the legislature chooses redistribution. In this sense, the majority of citizens in society and in the majority of districts finds representation in the legislative outcome. That is, low office-holding premia, $\gamma w_l < \bar{w}$, ensure that the majority of legislators support the policy preferred by the majority of citizens.

In summary, high-income citizens cannot predominate the legislature if office-holding premia are low enough for low-income citizens to still support redistribution once in office.

3.3 High Office-Holding Premia

Suppose that holding office pays a rather high premium over the market income citizens can expect, so that $\gamma w_l \geq \bar{w}$. That is, the income that legislators from the low-income group can generate while in office is high enough for them to oppose redistribution (Lemma 1). As legislators from the high-income group always oppose redistribution, all legislators oppose redistribution, irrespective of whether they have a high- or low-income background.

Given that legislators from all backgrounds vote for the same policy, if there is no benefit from having a high-average-ability legislature, i.e., if $\eta = 0$, then all voters are indifferent among candidates from all backgrounds. They thus randomize, irrespective of what group the candidates in their district are from. Each candidate is expected to receive the same share of votes, in which case a fair coin decides the election. Thus, if $\eta = 0$, then the probability of party P winning the seat in district j is

$$\pi_j(s_{P,j}, s_{-P,j}) = \frac{1}{2} \quad \forall (s_{P,j}, s_{-P,j}) \in \{l, h\}^2. \tag{4}$$

If there is a benefit from having a high-average-ability legislature, i.e., if $\eta > 0$, then all voters prefer the majority of legislators to have a high-income background because $w_i + \eta > w_i$. As all voters vote as if their vote was decisive in determining the district's representative and as if that representative's vote and characteristics were decisive in determining the outcome in the legislature, they vote for a candidate from a high-income background, if there is one. Thus, if $\eta > 0$, then the probability of party P winning the seat in district j is

$$\pi_j(s_{P,j}, s_{-P,j}) = \begin{cases} 0 & \text{if } (s_{P,j}, s_{-P,j}) = (l, h), \\ \frac{1}{2} & \text{if } (s_{P,j}, s_{-P,j}) \in \{(l,l),(h,h)\}, \\ 1 & \text{if } (s_{P,j}, s_{-P,j}) = (h, l). \end{cases} \tag{5}$$

The probability of party P winning the seat in district j is one if party P's candidate is from the high-income group, while party $-P$'s candidate is not; zero if party $-P$'s candidate is from the high-income group, while party P's candidate is not; and one-half if both parties' candidates are from the same group, in which case all voters are indifferent so that a fair coin is expected to decide the election. Proposition 2 characterizes all equilibria.

Proposition 2. *If $\gamma w_l \geq \bar{w}$, then every profile of candidates is an equilibrium if $\eta = 0$, while there is a unique equilibrium and all candidates are from the high-income group if $\eta > 0$.*

It follows that every profile of candidate selections with two candidates from the high-income group in the majority of districts is an equilibrium if $\eta = 0$. In such an equilibrium, the majority of legislators are high-income citizens, who thus predominate in the legislature. In many such equilibria in which the majority of legislators are high-income citizens, however, many legislators are low-income citizens. If $\eta > 0$, then all candidates and hence all legislators are high-income citizens. Thus, irrespective of η, the predominance of high-income citizens in the legislature is an equilibrium outcome. I collect this implication in a corollary.

Corollary 2. *If $\gamma w_l \geq \bar{w}$, then high-income citizens predominate the legislature in some equilibrium if $\eta = 0$, while they predominate the legislature in the unique equilibrium if $\eta > 0$.*

When a high-average-ability legislature delivers additional benefits to citizens, then all legislators are high-income citizens in equilibrium. This outcome resembles the predictions in Mattozzi and Snowberg (2018). However, this outcome can only occur because the political institutions grant high enough office-holding premia to lead low-income citizens who become legislators to oppose the redistribution policy preferred by the low-income group. Only in this case does the electoral advantage that high-income citizens enjoy matter. If low-income citizens still support redistribution once in office, then because redistribution is the salient policy issue, low-income citizens win most seats in the legislature and thus predominate in it. Regardless of whether a high-average-ability legislature delivers additional benefits, the legislature chooses no redistribution, irrespective of its composition in terms of the income-group background of its members. The policy outcome represents the redistribution preferences of a possibly small minority in society and not those of the possibly large majority.

In summary, high-income citizens can predominate the legislature if office-holding premia are high enough for low-income citizens to oppose redistribution once in office.

3.4 No Legislator Supports (More) Redistribution

In this section, I use the results from Sections 3.2 and 3.3 to link the observed predominance of high-income citizens among legislators to the redistribution policy legislators support. The predominance of high-income citizens in the legislature implies that all legislators, both from a high- and low-income background, oppose the policy preferred by low-income citizens.

Proposition 3. *In equilibrium, if high-income citizens predominate in the legislature, then no legislator supports redistribution.*

Because legislators vote as if their vote was decisive, this result concerns what legislators would do if their vote was pivotal rather than their public statements or voting records. It follows directly from combining the insights of Corollaries 1 and 2. Suppose that in some equilibrium, the outcome is that high-income citizens predominate in the legislature. Then, it must be the case that $\gamma w_l \geq \bar{w}$ because by Corollary 1, if $\gamma w_l < \bar{w}$, then high-income citizens do not predominate in the legislature. By contrast, if $\gamma w_l \geq \bar{w}$, then by Corollary 2, there is an equilibrium in which high-income citizens predominate in the legislature. Thus, by Lemma 1, all legislators oppose redistribution, regardless of whether they have a high- or low-income background. No legislator supports the redistribution policy preferred by low-income citizens.

If low-income candidates still support more redistribution once in office, then they win the votes of low-income citizens. Because low-income citizens have a majority in most electoral districts, low-income candidates win most seats. That is, high-income citizens cannot predominate in the legislature. Thus, if high-income citizens predominate among legislators, then legislators from a low-income background must oppose more redistribution once in office. That is, while office-holding premia could in principle be very low—or even zero—they must be high enough to induce legislators from a low-income background to oppose redistribution. Therefore, if high-income citizens predominate in the legislature, then all legislators oppose more redistribution, irrespective of whether they have a high- or low-income background.

The conclusion of Proposition 3 is valid even when a high-average-ability legislature generates additional benefits, in which case high-income citizens enjoy an electoral advantage that one might suspect underlies the predominance of high-income citizens in the legislature. Because redistribution is the salient policy issue, these additional benefits cannot fully compensate low-income citizens for no redistribution. If low-income citizens still support redistribution once in office, then they win the votes of low-income citizens and thus the majority of seats in the legislature. The electoral advantage only matters when low-income citizens oppose redistribution once in office, in which case all legislators, both from a high- and, even if hypothetical, low-income background, oppose redistribution. Thus, if high-income citizens predominate in the legislature, then all legislators oppose more redistribution.

The result and discussion apply to every income distribution (μ_l, w_l, μ_h, w_h) and thus to every level of income inequality. As long as high-income citizens predominate in the legislature, the extent of income inequality does not affect the redistribution policy that is enacted. This prediction is in line with some empirical evidence (e.g., Perotti 1996; Rodríguez 1999).

If society wishes to ensure that some legislators support the redistribution policies preferred by low-income citizens, then it could target office-holding premia. Besides tightening the restrictions on outside income, one could consider lowering legislator salaries—or possibly paying each legislator only compensation for their (estimated) individual opportunity costs.

3.5 A Role for a Sense of Group Identity

A number of concerns legislators might have could affect the policies they support in office. For example, a sense of (income) group identity could induce legislators to further their groups' political interests, even if doing so requires giving up a higher income in office. In this section, I extend the model to allow for such a sense of group identity to study the role it might play.[8]

3.5.1 Changes to the Environment

Suppose that legislators incur a utility cost $\kappa > 0$ if and only if they have a higher after-tax income than the other members of their original income group while that group's preferred policy is not enacted. That is, legislators "feel bad" if they abandon their original income group and its interests. The focus on the policy outcome rather than the individual legislator's vote is for consistency with legislators voting as if their vote was decisive. The qualification that legislators have to have a higher after-tax income than the other members of their original group is for internal consistency. It ensures that a high-income citizen selected by a party would not want to decline to be a candidate in the case when the legislature chooses redistribution, if they had that option. The utility cost is uniform because it is not related to income potential per se. To ensure that a low-income citizen selected by a party would not want to decline to be a candidate in the case when the legislature chooses no redistribution, if they had that option, I assume that $\gamma > 1$ and $\hat{\gamma} \equiv \gamma - \hat{\kappa} \geq 1$, where $\hat{\kappa} \equiv \kappa / w_l$. The assumption that $\gamma > 1$ implies that there is a premium associated with holding office. However, it does not imply that this premium is high, i.e., $\gamma w_l < \bar{w}$ is not ruled out. Moreover, for low-income citizens, a high office-holding premium γ can be outweighed by a high cost κ associated with a sense of group identity because $\gamma w_l > \gamma w_l - \kappa = \gamma w_l - \hat{\kappa} w_l = \hat{\gamma} w_l \geq w_l$.

3.5.2 Implications for Strategies and Payoffs

The payoffs of private citizens are unaffected and still given by (1). Lemma 2 still applies so that low-income voters prefer redistribution, while high-income voters prefer no redistribution.

Suppose that redistribution is implemented. Then, legislators from group l do not incur the utility cost because redistribution is their original income group's preferred policy. Legislators from group h do not incur the utility cost either because they have the same after-tax income $\bar{w}$ as all other members of their original income group.

Suppose that no redistribution is implemented. Then, legislators from group l incur the utility cost. Their original income group's preferred policy is not implemented while they

[8] See, e.g., Lind (2007), Shayo (2009), and Klor and Shayo (2010) on the role of group identity in determining voters' redistribution preferences.

have a higher after-tax income than all other members of their group because $\gamma > 1$ so that $\gamma w_l > w_l$. Legislators from group h do not incur the utility cost because no redistribution is their original income group's preferred policy. Therefore, letting $\gamma w_l + \chi\eta - \kappa = \gamma w_l + \chi\eta - \hat{\kappa} w_l = \hat{\gamma} w_l + \chi\eta$, the payoffs of legislators from groups l and h are

$$\hat{\psi}_l(t, \chi) = \begin{cases} \bar{w} + \chi\eta & \text{if } t = 1, \\ \hat{\gamma} w_l + \chi\eta & \text{if } t = 0, \end{cases} \tag{6}$$

and

$$\hat{\psi}_h(t, \chi) = \begin{cases} \bar{w} + \chi\eta & \text{if } t = 1, \\ \gamma w_h + \chi\eta & \text{if } t = 0, \end{cases} \tag{7}$$

respectively. Comparing the first and second entries of (7), legislators from the high-income group always oppose redistribution because $\gamma > 1$ and $w_h > \bar{w}$ together imply that $\gamma w_h > \bar{w}$. Comparing the first and second entries of (6), whether legislators from the low-income group support or oppose redistribution depends on whether or not the office-holding premium γ is high enough to overcome their sense of group identity and the associated cost κ. They support (oppose) redistribution if $\hat{\gamma} w_l < \bar{w}$ ($\hat{\gamma} w_l \geq \bar{w}$). That is, if $\hat{\gamma} w_l < \bar{w}$, then the office-holding premium is not high enough to overcome their sense of group identity.

Parties' strategies and payoffs are unaffected, and so is the definition of equilibrium.

3.5.3 Implications for the Results

First, suppose that $\hat{\gamma} w_l < \bar{w}$. Legislators from the low-income group support redistribution. As legislators from the high-income group oppose redistribution, all legislators from all groups support the policy preferred by citizens in their group. By the same logic as in Section 3.2, the probability of party P winning the seat in district j is given by (3).

Second, suppose that $\hat{\gamma} w_l \geq \bar{w}$. Legislators from the low-income group oppose redistribution. The office-holding premium is high enough to overcome their sense of group identity. As legislators from the high-income group oppose redistribution, all legislators oppose redistribution, irrespective of their income background. By the same logic as in Section 3.3, the probability of party P winning the seat in district j is given by (4) if $\eta = 0$ and by (5) if $\eta > 0$. The following proposition shows that the main result stated in Proposition 3 still holds.

Proposition 4. *Replacing γ by $\hat{\gamma}$, Propositions 1–2, Corollaries 1–2, and Proposition 3 hold.*

It follows from the adjusted Corollary 1 that if the office-holding premium is not high enough to overcome legislators' sense of group identity and induce them to oppose redistribution, then high-income citizens do not predominate in the legislature. As before, low-income candidates win the seats in the majority of districts as long as they support redistribution once in office. Therefore, if high-income citizens predominate in the legislature, then the office-holding premium must be high enough to overcome any sense of group identity legislators from a low-income background might have and induce them to oppose redistribution. That is, as before, if high-income citizens predominate in the legislature, then no legislator supports redistribution, irrespective of whether they have a high- or low-income background.

To summarize, the logic captured in Proposition 3 carries over to this extended environment and is thus robust to the addition of a role for a sense of group identity.

3.6 A Role for Reelection Concerns

The desire to be reelected by their district might convince legislators to support the policies preferred by the majority of their constituents. In this section, I extend the model to allow for reelection concerns to study the role they might play.[9]

3.6.1 Changes to the Environment

Suppose that legislators from group i incur a cost $\kappa_i = \tilde{\kappa} w_i > 0$ for some constant $\tilde{\kappa} > 0$ if and only if they have a higher after-tax income than the majority in the district they represent while that majority's preferred policy is not enacted. That is, legislators incur a cost if they have a relatively high income while in office but do not deliver their constituents' preferred policies. The focus on the policy outcome rather than the individual legislator's vote is for consistency with legislators voting as if their vote was decisive. The qualification that legislators have to have a higher after-tax income than the majority in the district they represent is for internal consistency. It ensures that a citizen selected by a party in a district with a high-income majority would not want to decline to be a candidate in the case when the legislature chooses redistribution, if they had that option. One can think of this cost as capturing a desire to be reelected by their district. The implicit assumption that $\kappa_h > \kappa_l$ captures the idea that legislators from a high-income background lose a higher payoff associated with holding office if they are not reelected. It is consistent with the implicit assumption that $\gamma w_h > \gamma w_l$ (which I discuss in Section 4.1). To ensure that a citizen selected by a party in a district with a low-income majority would not want to decline to be a candidate in the case when the legislature chooses no redistribution, if they had that option, I assume that $\gamma > 1$ and $\tilde{\gamma} \equiv \gamma - \tilde{\kappa} \geq 1$. Besides internal consistency, this assumption has two additional implications. First, reelection concerns cannot induce legislators from a high-income background to support more redistribution. Given laws recently passed by the United States Congress, for example, arguably, this implication is not unreasonable.[10] Second, the assumption that $\gamma > 1$

[9] For analyses of the role of reelection in its own right, see, e.g., Duggan (2000); Van Weelden (2013).

[10] The United States Congress, the majority of the members of which have a high-income background, recently passed laws that are expected to reduce redistribution, like, e.g., the 115th Congress' Public Law

implies that there is a premium associated with holding office. However, it does not imply that this premium is high, i.e., $\gamma w_l < \bar{w}$ is not ruled out. Moreover, for low-income citizens, a high office-holding premium γ can be outweighed by a high cost κ_l associated with not being reelected because $\gamma w_l > \gamma w_l - \kappa_l = \gamma w_l - \tilde{\kappa} w_l = \tilde{\gamma} w_l \geq w_l$.

3.6.2 Implications for Strategies and Payoffs

The payoffs of private citizens are unaffected and still given by (1). Lemma 2 still applies so that low-income voters prefer redistribution, while high-income voters prefer no redistribution.

Suppose that redistribution is implemented. Then, legislators representing a district with a majority of low-income citizens do not incur the cost because redistribution is the preferred policy of the majority of their constituents, i.e., they have delivered. Legislators representing a district with a majority of high-income citizens do not incur the cost either because they have the same after-tax income $\bar{w}$ as the residents in the district (and in all other districts).

Suppose that no redistribution is implemented. Then, legislators representing a district with a majority of low-income citizens do incur the cost. They did not deliver the preferred policy of the majority of their constituents while having a higher after-tax income than that same majority, as $\gamma w_h > \gamma w_l > w_l$ due to $\gamma > 1$. Legislators representing a district with a majority of high-income citizens do not incur the cost because no redistribution is the preferred policy of the majority of their constituents, i.e., they have delivered. Letting $\gamma w_i + \chi\eta - \kappa_i = \gamma w_i + \chi\eta - \tilde{\kappa} w_i = \tilde{\gamma} w_i + \chi\eta$, the payoff of a legislator from group i representing district j is

$$\tilde{\psi}_i(t, \chi, j) = \begin{cases} \bar{w} + \chi\eta & \text{if } t = 1, j \in D_l, \\ \bar{w} + \chi\eta & \text{if } t = 1, j \in D_h, \\ \tilde{\gamma} w_i + \chi\eta & \text{if } t = 0, j \in D_l, \\ \gamma w_i + \chi\eta & \text{if } t = 0, j \in D_h. \end{cases} \tag{8}$$

Comparing the third and fourth entries with the first and second entries of (8), respectively, legislators from the high-income group always oppose redistribution because $\gamma > \tilde{\gamma} \geq 1$ and $w_h > \bar{w}$ together imply that $\gamma w_h > \tilde{\gamma} w_h > \bar{w}$. By the same comparison, whether legislators from the low-income group support or oppose redistribution depends on the effective office-holding premium and the district they represent. If they represent a district with a majority of low-income citizens, then they support (oppose) redistribution if $\tilde{\gamma} w_l < \bar{w}$ ($\tilde{\gamma} w_l \geq \bar{w}$). If they represent a district with a majority of high-income citizens, then they support (oppose) redistribution if $\gamma w_l < \bar{w}$ ($\gamma w_l \geq \bar{w}$). That is, if $\tilde{\gamma} w_l < \bar{w}$, then the office-holding premium is not high enough to overcome the reelection concerns of legislators from a

97—i.e., the December 2017 tax reform. For details, see the 115th Congress' Public Law 97 at https://www.congress.gov/bill/115th-congress/house-bill/1/text and the Congressional Budget Office's estimates of its distributional effects at https://www.cbo.gov/publication/53429.

low-income background who represent a district with a low-income majority.

Parties' strategies and payoffs are unaffected, and so is the definition of equilibrium.

3.6.3 Implications for the Results

There are three cases: *1.* $\tilde{\gamma} w_l < \gamma w_l < \bar{w}$; *2.* $\bar{w} \leq \tilde{\gamma} w_l < \gamma w_l$; *3.* $\tilde{\gamma} w_l < \bar{w} \leq \gamma w_l$.

First, suppose that $\tilde{\gamma} w_l < \gamma w_l < \bar{w}$. Legislators from the low-income group support redistribution, irrespective of which district they represent. As legislators from the high-income group oppose redistribution, all legislators from all groups support the policy preferred by citizens in their group. By the same logic as in Section 3.2, the probability of party P winning the seat in district j is given by (3).

Second, suppose that $\gamma w_l > \tilde{\gamma} w_l \geq \bar{w}$. Legislators from the low-income group oppose redistribution, irrespective of which district they represent. The office-holding premium is high enough to overcome their reelection concerns. As legislators from the high-income group oppose redistribution, all legislators oppose redistribution, irrespective of their income background and what district they represent. By the same logic as in Section 3.3, the probability of party P winning the seat in district j is given by (4) if $\eta = 0$ and by (5) if $\eta > 0$.

Finally, suppose that $\tilde{\gamma} w_l < \bar{w} \leq \gamma w_l$. In this case, the voting behavior of legislators from a low-income background depends on which income group has a majority in the district they represent. If they represent a district with a low-income majority, i.e., $j \in D_l$, then reelection concerns shape their voting behavior: even though $\gamma w_l \geq \bar{w}$, they support redistribution because $\tilde{\gamma} w_l < \bar{w}$. The office-holding premium is not high enough to overcome their reelection concerns. As legislators from the high-income group oppose redistribution, a legislator from any group representing this district supports the policy preferred by citizens in their group. Similar to the logic in Section 3.2, in this district, voters from each group vote for a candidate from their group, if there is one, and randomize if both candidates are from the same group. That is, the probability of party P winning the seat in district $j \in D_l$ is given by (3).

If legislators from a low-income background represent a district with a high-income majority, i.e., $j \in D_h$, then they oppose redistribution because $\gamma w_l \geq \bar{w}$. As legislators from the high-income group oppose redistribution, every legislator representing this district opposes redistribution, irrespective of their income background. Similar to the logic in Section 3.3, in this district, voters randomize irrespective of what groups the candidates are from and the election is expected to be decided by a fair coin if $\eta = 0$, while they vote for a candidate from the high-income group, if there is one, and randomize if both candidates are from the same group if $\eta > 0$. That is, the probability of party P winning the seat in district $j \in D_h$ is given by (4) if $\eta = 0$ and by (5) if $\eta > 0$. The following proposition shows that the main result stated in Proposition 3 still holds.

Proposition 5. *There are three cases:*

1. *If $\tilde{\gamma} w_l < \gamma w_l < \bar{w}$, then there is a unique equilibrium, and all candidates are from their district's majority group.*

2. *If $\gamma w_l > \tilde{\gamma} w_l \geq \bar{w}$, then every profile of candidates is an equilibrium if $\eta = 0$, while there is a unique equilibrium and all candidates are from the high-income group if $\eta > 0$.*

3. *If $\tilde{\gamma} w_l < \bar{w} \leq \gamma w_l$, then an equilibrium exists, and in every equilibrium, in every district with a low-income majority, both candidates are from the low-income group.*

In equilibrium, if high-income citizens predominate in the legislature, then no legislator supports redistribution.

If the office-holding premium is not high enough to overcome legislator's reelection concerns and induce them to oppose redistribution, then high-income citizens do not predominate in the legislature. As before, low-income candidates win the seats in the majority of districts as long as they support redistribution once in office. Therefore, if high-income citizens predominate in the legislature, then the office-holding premium must be high enough to overcome any reelection concerns legislators from a low-income background might have and induce them to oppose redistribution. (In the second case with $\eta = 0$, in many equilibria in which the majority of legislators are high-income citizens, who thus predominate in the legislature, there are also many legislators with a low-income background.) That is, as before, if high-income citizens predominate in the legislature, then no legislator supports redistribution, irrespective of whether they have a high- or low-income background.

To summarize, the logic captured in Proposition 3 carries over to this extended environment and is thus robust to the addition of a role for reelection concerns.

3.7 A Role for a Second Policy Dimension

Many policy issues cut across income groups. In this section, I study the role they might play. I extend the environment by adding a second policy dimension, the preferences over which are a source of heterogeneity among citizens that is independent of income.

3.7.1 Changes to the Environment

Suppose that there is an additional policy dimension that I refer to as regulation and that the legislature decides over in a separate plurality vote. A fraction $\lambda_1 > 0$ of the citizens in each income group in each district prefer regulation to be enacted. If regulation is enacted, then citizens in this group experience an additional utility benefit $\theta > 0$. The remaining fraction $\lambda_0 = 1 - \lambda_1 > 0$, $\lambda_0 < \lambda_1$, of the citizens in each income group in each district prefer regulation not be enacted. Citizens in this group experience an additional utility benefit $\theta > 0$ if regulation is not enacted. Thus, in every district j, there are four types of citizens: $\lambda_1 \mu_l^j > 0$

citizens of type $(l,1)$ who have low income and prefer regulation; $\lambda_0\mu_l^j > 0$ citizens of type $(l,0)$ who have low income and prefer no regulation; $\lambda_1\mu_h^j > 0$ citizens of type $(h,1)$ who have high income and prefer regulation; and $\lambda_0\mu_h^j > 0$ citizens of type $(h,0)$ who have high income and prefer no regulation, where $\lambda_1\mu_l^j + \lambda_0\mu_l^j + \lambda_1\mu_h^j + \lambda_0\mu_h^j = 1/d$. However, the benefits from issues unrelated to redistribution cannot fully compensate low-income citizens for too little redistribution, i.e., $\eta + \theta < \bar{w} - w_l$.[11] That is, redistribution is the salient policy issue.

3.7.2 Implications for Strategies and Payoffs

Let $\delta \in \{0,1\}$ indicate whether or not regulation is enacted, where $\delta = 1$ means that it is enacted, while $\delta = 0$ means that it is not enacted. The payoffs of voters of type $(i,1)$ are

$$(9) \qquad \breve{\phi}_{i,1}(t,\delta,\chi) = \begin{cases} \bar{w} + \chi\eta + \delta\theta & \text{if } t = 1, \\ w_i + \chi\eta + \delta\theta & \text{if } t = 0, \end{cases}$$

while those of voters of type $(i,0)$ are

$$(10) \qquad \breve{\phi}_{i,0}(t,\delta,\chi) = \begin{cases} \bar{w} + \chi\eta + (1-\delta)\theta & \text{if } t = 1, \\ w_i + \chi\eta + (1-\delta)\theta & \text{if } t = 0. \end{cases}$$

The payoffs of legislators of type $(i,1)$ are

$$(11) \qquad \breve{\psi}_{i,1}(t,\delta,\chi) = \begin{cases} \bar{w} + \chi\eta + \delta\theta & \text{if } t = 1, \\ \gamma w_i + \chi\eta + \delta\theta & \text{if } t = 0, \end{cases}$$

while those of legislators of type $(i,0)$ are

$$(12) \qquad \breve{\psi}_{i,0}(t,\delta,\chi) = \begin{cases} \bar{w} + \chi\eta + (1-\delta)\theta & \text{if } t = 1, \\ \gamma w_i + \chi\eta + (1-\delta)\theta & \text{if } t = 0. \end{cases}$$

As legislators vote as if their vote was decisive, legislators of types $(i,1)$ and $(i,0)$ always vote for and against regulation, respectively. Comparing the first and second entries in equations (11) and (12), legislators support (oppose) redistribution if $\gamma w_i < \bar{w}$ ($\gamma w_i \geq \bar{w}$). That is, irrespective of their preferences over regulation, legislators from the high-income group oppose redistribution because $\gamma \geq 1$ and $w_h > \bar{w}$ together imply that $\gamma w_h > \bar{w}$. As before,

[11] Roemer (1998) studies political competition between two parties that represent constituents with preferences over taxation and a second policy dimension, where wealth or income and the stance on the second policy dimension are not independently distributed. He finds conditions under which the party representing (a subset of) the majority in society (the poor) does not propose their ideal tax rate. One of the conditions he identifies is that the second policy dimension is sufficiently salient. I assume the opposite of this condition. Also see, e.g., Besley and Coate (2003, 2008) on issue (un)bundling.

whether legislators from the low-income group support or oppose redistribution depends on the size of the office-holding premium, irrespective of their preferences over regulation.

As before, all voters vote as if their vote was decisive in determining the district's representative and as if that representative's vote and characteristics were decisive in determining the outcome in the legislature. That is, for example, as a candidate of type $(h, 0)$ can contribute to generating additional benefits in the legislature and opposes both redistribution and regulation, a voter of type $(h, 1)$ associates payoff $w_h + \eta$ with voting for them, while a voter of type $(l, 0)$ associates payoff $w_l + \eta + \theta$ with voting for them.

Parties can select their candidates from any of the types of citizens in each district. That is, $s_{P,j} \in \{(l, 1), (l, 0), (h, 1), (h, 0)\}$ indicates the type of citizen from which party $P \in \{A, B\}$ selects its candidate in district $j \in D$. A strategy s_P for party $P \in \{A, B\}$ then is a collection of candidate selections for all districts,

$$s_P = (s_{P,1}, \dots, s_{P,d}) \in \mathcal{S} \equiv \{(l, 1), (l, 0), (h, 1), (h, 0)\}^d.$$

Apart from the definition of $\mathcal{S}$, parties' payoffs and the definition of equilibrium are unchanged.

3.7.3 Implications for the Results

If both candidates in a district are of the same type, then all voters are indifferent among them and thus randomize. Each candidate is expected to receive the same share of votes, in which case a fair coin decides the election. That is, in every district $j \in D$,

$$\pi_j(y, y) = \frac{1}{2} \quad \forall y \in \{(l, 1), (l, 0), (h, 1), (h, 0)\}. \tag{13}$$

As to office-holding premia, first, suppose that $\gamma w_l < \bar{w}$. Legislators from the low-income group support redistribution. Legislators from the high-income group oppose redistribution. Let $i_j^* \in \{l, h\}$ indicate the majority income group in district j. Lemma 3 provides all details needed about the probability of party P winning the seat in district j in this case.

Lemma 3. *If $\gamma w_l < \bar{w}$, then $\pi_j((i_j^*, 1), y) = 1$ for all $y \neq (i_j^*, 1)$ and $j \in D$.*

As the benefits from issues unrelated to redistribution cannot fully compensate them for too little redistribution, low-income citizens always vote for a low-income candidate, if there is one, irrespective of their stance on regulation. Similarly, high-income citizens always vote for a high-income candidate, if there is one, irrespective of their stance on regulation. If there are two candidates from the same income group but with different stances on regulation, then voters vote for the candidate who shares their preferences on regulation. Thus, a candidate from the district's majority income group who favors regulation, as do the majority of voters in every district, wins the election with certainty unless their opponent is of the same type.

Second, suppose that $\gamma w_l \geq \bar{w}$. Legislators from the low-income group oppose redistribution. As legislators from the high-income group oppose redistribution, all legislators oppose redistribution, irrespective of their income background. Therefore, if $\eta = 0$, then candidates' stances on regulation are all that matters to voters. Lemma 4 provides all details needed about the probability of party P winning the seat in district j in this case.

Lemma 4. *If $\gamma w_l \geq \bar{w}$ and $\eta = 0$, then $\pi_j((i_{P,j}, 1), (i_{-P,j}, 1)) = 1/2$ for all $(i_{P,j}, i_{-P,j}) \in \{l, h\}^2$ and $j \in D$ and $\pi_j((i_{P,j}, 1), (i_{-P,j}, 0)) = 1$ for all $(i_{P,j}, i_{-P,j}) \in \{l, h\}^2$ and $j \in D$.*

If only one candidate favors regulation, then that candidate wins the election with certainty. For all other constellations, all voters in the district are indifferent among both candidates and thus randomize so that a fair coin flip is expected to decide the election. If $\eta > 0$, then voters care about candidates' stances on regulation and at the same time prefer the majority of legislators to have a high-income background. Lemma 5 provides all details needed about the probability of party P winning the seat in district j in this case.

Lemma 5. *If $\gamma w_l \geq \bar{w}$ and $\eta > 0$, then $\pi_j((h, 1), y) = 1$ for all $y \neq (h, 1)$ and $j \in D$.*

A high-income candidate who favors regulation wins the election with certainty against all candidates who differ from them in at least one dimension. All voters prefer a legislator from the high-income group, and a majority of voters prefer a legislator who favors regulation. If both candidates share the same stance on regulation but are from different income backgrounds, then all voters vote for the high-income candidate, who thus wins the election with certainty. If both candidates are from the same income group but differ in their stance on regulation, then the majority of voters vote for the candidate who favors regulation, who thus wins the election with certainty. The following proposition shows that the main result stated in Proposition 3 still holds.

Proposition 6. *There are two cases:*

1. *If $\gamma w_l < \bar{w}$, then there is a unique equilibrium, and all candidates are from their district's majority income group and favor regulation.*

2. *If $\gamma w_l \geq \bar{w}$, then every profile of candidates who favor regulation is an equilibrium if $\eta = 0$, while there is a unique equilibrium and all candidates are from the high-income group and favor regulation if $\eta > 0$.*

In equilibrium, if high-income citizens predominate in the legislature, then no legislator supports redistribution.

As long as the benefits from issues unrelated to redistribution cannot fully compensate low-income citizens for too little redistribution, with low office-holding premia, high-income citizens do not predominate in the legislature. As before, low-income candidates win the seats in the majority of districts as long as they support redistribution once in office. Therefore, if high-income citizens predominate in the legislature, then the office-holding premium must be high enough to induce legislators from a low-income background to oppose redistribution. (In the second case with $\eta = 0$, in many equilibria in which the majority of legislators are high-income citizens, who thus predominate in the legislature, there are also many legislators with a low-income background.) That is, as before, if high-income citizens predominate in the legislature, then no legislator supports redistribution, irrespective of whether they have a high- or low-income background. As all candidates and thus all legislators support regulation, regulation is enacted. Hence, the majority stance on regulation among citizens finds support among legislators.

To summarize, the logic captured in Proposition 3 carries over to this extended environment and is thus robust to the addition of a role for a second policy dimension.

3.8 A Role for Campaign Finance and Special Interests

Candidates for office might face campaign costs. Such costs could be a concern if the only way candidates can pay for them is out of their own pocket. In this case, only rich citizens can run for office, which would be a serious problem for a democratic society to begin with. However, such costs might be less of a concern if candidates can fundraise to cover them. For the 115th United States Congress for example, about 43% of all candidates for the US House of Representatives in the 2016 election contributed or loaned nothing at all to their campaigns; about 52% of all candidates contributed or loaned no more than \$1,000 to their campaigns; and about 69% of all candidates contributed or loaned no more than \$10,000 to their campaigns. Moreover, of all winners, about 83%, 86%, and 89% contributed or loaned nothing at all, no more than \$1,000, and no more than \$10,000 to their campaigns, respectively; of all nonincumbent winners, about 27%, 38%, and 45% contributed or loaned nothing at all, no more than \$1,000, and no more than \$10,000 to their campaigns, respectively.[12] That is, being rich or having a high income is not necessary to win the office, let alone to run for it. In particular, candidates might raise money from interest groups that care about "winning a district's seat" by supporting a candidate who is aligned with them on their issue and votes in their favor on related policies once in office. In this section, I extend the environment to allow for such a role for a special interest group whose policy issue is independent of income.[13]

[12] Data from the Federal Election Commission, accessed on 7/2/2019 at `https://www.fec.gov/data/browse-data/?tab=historical` and `https://www.congress.gov/members` accessed on 7/4/2019.

[13] I focus on campaign finance, with rather stark assumptions (also see, e.g., Besley and Coate 2003, 2008). On lobbying, see, e.g., Besley and Coate (2001); Felli and Merlo (2006); Gehlbach et al. (2010).

3.8.1 Changes to the Environment

Starting from the environment in Section 3.7, suppose that running for office is prohibitively costly for individual citizens. There is a special interest group with abundant resources that opposes regulation. It is ready to finance the campaign costs of all candidates in all districts who will vote in line with their agenda on related policies in the legislature once in office.

3.8.2 Implications for Strategies and Payoffs

As in Section 3.7, the payoffs of voters of type $(i, 1)$ are given by (9), while those of voters of type $(i, 0)$ are given by (10). Similarly, the payoffs of legislators of type $(i, 1)$ are given by (11), while those of legislators of type $(i, 0)$ are given by (12). Comparing the first and second entries in Equations (11) and (12), legislators support (oppose) redistribution if $\gamma w_i < \bar{w}$ ($\gamma w_i \geq \bar{w}$). That is, legislators from the high-income group oppose redistribution because $\gamma \geq 1$ and $w_h > \bar{w}$ together imply that $\gamma w_h > \bar{w}$. Whether legislators from the low-income group support or oppose redistribution depends on the size of the office-holding premium.

As all legislators vote as if their vote was decisive, legislators of types $(i, 1)$ and $(i, 0)$ vote for and against regulation, respectively. The special interest group thus finances a candidate's campaign if and only if the candidate is of types $(l, 0)$ or $(h, 0)$. Citizens of types $(l, 1)$ and $(h, 1)$ cannot run for office. Parties can select their candidates in each district only from those citizens who oppose regulation. That is, $s_{P,j} \in \{(l, 0), (h, 0)\}$ indicates the type of citizen from which party $P \in \{A, B\}$ selects its candidate in district $j \in D$. Suppressing the regulation preference 0 from the types of citizens that can run for office so that $s_{P,j} \in \{l, h\}$, parties' strategies and payoffs as well as the definition of equilibrium are as specified in Section 3.1.

3.8.3 Implications for the Results

First, suppose that $\gamma w_l < \bar{w}$. Legislators from the low-income group support redistribution. As legislators from the high-income group oppose redistribution, all legislators from all income groups support the redistribution policy preferred by citizens in their group. Ignoring regulation because all candidates vote against it once in office, by the same logic as in Section 3.2, the probability of party P winning the seat in district j is given by (3).

Second, suppose that $\gamma w_l \geq \bar{w}$. Legislators from the low-income group oppose redistribution. As legislators from the high-income group oppose redistribution, all legislators oppose redistribution, irrespective of their income background. Again, ignoring regulation because all candidates vote against it once in office, by the same logic as in Section 3.3, the probability of party P winning the seat in district j is given by (4) if $\eta = 0$ and by (5) if $\eta > 0$. The following proposition shows that the main result stated in Proposition 3 still holds.

Proposition 7. *Propositions 1–2, Corollaries 1–2, and Proposition 3 hold.*

As before, low-income candidates win the seats in the majority of districts as long as they support redistribution once in office. The observed predominance of high-income citizens in the legislature requires that legislators from all backgrounds oppose redistribution once in office. That is, if high-income citizens predominate in the legislature, then no legislator supports redistribution, irrespective of whether they have a high- or low-income background. As all candidates and thus all legislators oppose regulation, regulation is not enacted. The majority stance on regulation among citizens does not find support among legislators.

To summarize, the logic captured in Proposition 3 carries over to this extended environment and is thus robust to the addition of a role for campaign costs, campaign finance, and a special interest group whose policy issue is independent of income.

4 Discussion

Two assumptions the main result rests on are that all citizens can in principle both vote and run for office and that redistribution is the salient policy issue. As I discuss the issue of campaign costs and finance in Section 3.8, the former assumption can be interpreted as there not being any wealth, property, or education qualifications for voting and holding office. This condition is generally met in most modern democracies—and it would be a concern for a democratic society if it was not met. The latter assumption justifies asking what role the redistribution preferences of low-income citizens play in the policy-making process given that high-income citizens predominate in the legislature to begin with. To the extent that policy preferences over issues that have no inherent redistributional component are independent of income, if redistribution is not a salient policy issue, then there should not be any concerns about the role that the policy preferences of low-income citizens play in the policy-making process in the first place. In this case, one might even wonder why we are investigating this question. Therefore, these two assumptions are not unreasonable. I next discuss a number of further modeling choices and interpretations.

4.1 Legislator Preferences, Legislator Income, and Office-Holding Premia

The assumption that legislators vote according to their personal policy preferences finds empirical support in the literature (e.g., Levitt 1996; Lee et al. 2004; Matsusaka 2017). The logic of the results then rests on the idea that the political institutions elected representatives face once in office—the laws and rules in place, which at least in the short run are exogenous from the point of view of the individual legislator—may alter the policies they support. Throughout the paper, I interpret γ as capturing an income premium associated with holding office. Empirical evidence for office-holding premia is provided by, e.g., Gagliarducci et al. (2010), Eggers and Hainmueller (2009), Peichl et al. (2013), Kotakorpi et al. (2017), and Berg (2020).

One possible element of such a premium is a high legislator salary (e.g., Berg 2020). As an example, a few numbers from the United States are suggestive. In 2016, the salary of a generic member of the United States Congress was $174,000, which was more than four times the median earnings of under $40,000 in the US population aged 25 and over.[14] That is, winning a seat in Congress would have more than quadrupled the median earner's earned income. With such a salary interpretation, the predominance of high-income citizens in the legislature being associated with high office-holding premia is consistent with empirical evidence that higher politician pay is associated with more educated politicians from higher-paying occupations (e.g., Gagliarducci and Nannicini 2013; Carnes and Hansen 2016).

Another possible element of an office-holding premium is outside income generated from, e.g., businesses, consultancy, board memberships, speeches, and books. The premium's size then depends on the laws and ethics rules in place and their enforcement.[15] For example, in 2016, the outside earned income limit facing members of the United States Congress was $27,495 (Brudnick 2016). Outside unearned income from, e.g., investments—which might in part be made out of the relatively high congressional salaries[16]—was unrestricted. The highest estimated outside income reported for a member of Congress was over $1.7 million.[17] With a focus on this element, γ captures the role of restrictions on outside activities and income imposed by the political institutions without modeling the underlying agency problems (e.g., Gagliarducci et al. 2010). It might capture explicit restrictions as well as implicit rules and custom. It might similarly capture how time-consuming the role of a legislator is and thus how much time they can spend engaging in outside activities. Any such restrictions deriving from institutions and legislature custom are the same for all legislators. The productivity of outside opportunities, for example, thus depends on the individual legislator's productivity in those activities. On average, the skills and abilities associated with high-income occupations in the private sector are likely more transferable to politicians' opportunities to generate outside income than those associated with less well-paying occupations. The implication that $\gamma w_h > \gamma w_l > 0$ captures this aspect. In principle, γ could be interpreted as capturing legislators' increased income potential in a future post-legislature career (e.g., Diermeier et al. 2005; Mattozzi and Merlo 2008; Eggers and Hainmueller 2009; Parker and Parker 2009; Palmer and Schneer 2016). Higher expected future income likely does affect a legislator's support for, e.g., certain changes to the tax code.

Allowing the office-holding premium to vary by group so that there are $\gamma_l \geq 1$ and $\gamma_h \geq$

[14] Brudnick (2016) and United States Census Bureau, 2012–2016 American Community Survey 5-year estimates, accessed on 9/25/2018.

[15] As an example, see Djankov et al. (2010) on financial and business disclosure rules.

[16] According to Manning (2018), at the beginning of the 115th Congress, members had on average served in Congress for about 10 years already, allowing for investments made out of the high congressional salaries.

[17] Center for Responsive Politics, accessed at `https://www.opensecrets.org/personal-finances/top-outside-income?filter=C&year=2016` on 12/03/2019.

1, which may be such that $\gamma_l \neq \gamma_h$, makes no difference. High-income citizens prefer no redistribution irrespective of their role in society. What matters is only how high the office-holding premium is for low-income citizens, which is captured by the condition $\gamma w_l < (\geq) \bar{w}$. If the office-holding premium were to vary by group, then the condition $\gamma w_l < (\geq) \bar{w}$ would be replaced by the condition $\gamma_l w_l < (\geq) \bar{w}$. All results and the underlying logic are unaffected.

Finally, adding nonmonetary benefits derived from, e.g., status and other perks associated with holding office that cannot be taxed does not affect legislators' payoff comparisons and thus their voting behavior and the results. Similarly, adding nonmonetary costs derived from, e.g., the loss of privacy due to subjecting oneself to public scrutiny has no effect.

4.2 Parties, Parties' Motivation, and Party Discipline

The role of political parties here is to mechanically select the most promising candidates.[18] The assumption that there are two of them is realistic for the United States and ensures that an equilibrium exists without further restrictions on the income distribution. The assumption that parties only care about the number of their seats in the legislature emphasizes the focus on potential candidates' ability to win the office. However, the logic carries over to the case of policy-motivated parties. Suppose that parties only care about the redistribution policy the legislature enacts, where one party supports redistribution, while the other one opposes it. If office-holding premia are low enough, then legislators from a low-income background support redistribution, while legislators from a high-income background oppose it. Ignoring weakly dominated strategies, the party that supports redistribution then selects low-income candidates in enough of the districts with a majority of low-income citizens to ensure that low-income citizens win the seat in the majority of districts. Thus, high-income citizens cannot predominate in the legislature. If office-holding premia are high enough, then legislators from all income backgrounds oppose redistribution once in office. Parties are then indifferent among the income backgrounds of possible candidates, and voters are either indifferent or prefer candidates from a high-income background due to their potential to help generate additional benefits. In this case, high-income citizens can predominate in the legislature, and no legislator supports redistribution once in office, regardless of whether they have a high- or low-income background.

In the case of policy-motivated parties, there can be a role for party discipline to counteract the effect of high office-holding premia on how legislators from a low-income background vote in the legislature. However, suppose that the party that supports redistribution can induce enough party discipline to overcome the fact that legislators from a low-income background oppose redistribution due to high office-holding premia. Then, low-income candidates selected by this party vote in favor of redistribution once in office. Absent other changes to the

[18] On the role of parties in their own right, see, e.g., Bernhardt et al. 2009; Galasso and Nannicini 2011.

environment, low-income candidates win the seats in the majority of districts. High-income citizens cannot predominate in the legislature. The predominance of high-income citizens among legislators thus requires that the party that supports redistribution cannot induce enough party discipline to overcome the effect of high office-holding premia. That is, if high-income citizens predominate in the legislature, then no legislator supports more redistribution, regardless of whether they have a high- or low-income background.

4.3 Income Distribution, Taxation, and the Policy Space

The assumption that $|D_l| > |D_h|$ captures the empirical observation that low-income citizens do not only constitute a majority in the United States overall, which is captured by the assumption that $\mu_l > \mu_h$, but also in the majority of US congressional districts (see Footnote 2). If $|D_l| < |D_h|$ were to hold, then high-income citizens would constitute a majority in the majority of electoral districts. That is, in the majority of congressional districts, the median income in the district is higher than the mean income in the population overall. For the case of high office-holding premia, the analysis and results would be unaffected. However, high-income citizens could predominate in the legislature when office-holding premia are low.

The assumption that there are only two income levels is not important. The logic is that in the empirically relevant case in which the majority of voters in the majority of districts have a less-than-average income, low-income candidates who support redistribution once in office win the district elections in this majority of districts. That is, predominance of high-income citizens in the legislature is impossible. Therefore, suppose that there are groups with income levels between w_l and w_h, and suppose that every district has residents from all income groups. Some of these additional income levels might be above and some might be below the average income. However, as long as the majority of voters in the majority of districts still have a less-than-average income, the logic is unaffected. If candidates from the lowest-income background still support redistribution once in office, then they win the majority of votes and thus the seats in the majority of districts, and high-income citizens do not predominate in the legislature. Therefore, the observed predominance of high-income citizens in the legislature would require that office-holding premia are high enough for even the lowest-income citizens to oppose redistribution once in office.

I restrict the policy space for the tax rate t to $\{0, 1\}$. If that policy space was $[0, 1]$ instead, then the ideal point of every citizen in any role would be either 0 or 1. As long as an equilibrium of the voting game in the legislature in which the majority does not implement their shared ideal point is considered unreasonable and somehow ruled out, the restriction to $\{0, 1\}$ is inconsequential. Given this policy space, the analysis is unchanged when voting in the legislature is strategic with weakly dominated voting strategies being excluded. For simplicity, I abstract from a trade-off between the size of the pie and its distribution (e.g., Meltzer and

Richard 1981). If this trade-off were present, then redistribution would be implemented with a tax rate less than one. None of the results would change materially.

One could interpret η as the benefit to citizens associated with a public good that can only be provided by a legislature with a majority of legislators from a high-income background and which is financed using some preexisting budget. To the extent that redistribution is the salient policy issue, a public good then does not affect the underlying logic. Changing notation to index χ by j and letting χ_j indicate whether or not the legislator representing district j has a high-income background, one could similarly interpret η as the benefit to citizens residing in a district associated with a local public good that only legislators from a high-income background can bring to their district and which is financed using some preexisting budget. Absent other changes, again, to the extent that redistribution is the salient policy issue, local public goods then do not affect the underlying logic. If spending on these public goods were a rival use of the tax receipts that are used for redistribution, then the formalization of redistribution being the salient policy issue might change.

5 Concluding Remarks

This paper contributes to the debate about what role the policy preferences of low-income citizens play in the policy-making process in representative democracies. I show that, provided redistribution is the salient policy issue, the observed predominance of high-income citizens in the legislature may under certain conditions imply that no legislator supports the redistribution policy preferred by low-income citizens. That is, low-income citizens' redistribution preferences might not play a role in the policy-making process at all. This finding concerns what legislators would do if their vote decided the policy outcome. It does therefore not depend on an interpretation of legislators' public statements or voting records, which might involve strategic interactions and messaging to voters. It does also not depend on an interpretation of enacted policy outcomes.

Future work could further explore the robustness of the underlying logic to establish what elements of an environment, if any, might prevent this implication from arising. For example, one might ask under what conditions this implication still arises when party politics or gatekeepers play a more important role at the candidate selection stage. Future work could also explore alternative channels through which this implication might arise. For example, it could analyze the roles of status and group identity derived from holding a prestigious office. Future work could more fully analyze the role of electoral incentives. For example, it could assess when and to what extent this implication arises in an environment with proportional representation at the electoral stage. Finally, future work could investigate which of the conditions leading to this implication might be violated. For example, one might ask whether and to what extent redistribution is the salient policy issue in congressional elections.

A Proofs

In this appendix, I provide the proofs. Lemmas 1 and 2 derive directly from comparing the respective entries in Equations (1) and (2), and Corollaries 1 and 2 follow immediately from Propositions 1 and 2. Their proofs are thus omitted.

Proposition 1

Proof. The probability of party $P \in \{A, B\}$ winning the seat in district j is given by (3). Consider the strategy profile (s^*_A, s^*_B) such that $(s^*_{A,j}, s^*_{B,j}) = (i^*_j, i^*_j)$ for all $j \in D$. Then, by (3), $\pi_j(s^*_{P,j}, s^*_{-P,j}) = \pi_j(i^*_j, i^*_j) = 1/2$ for all $P \in \{A, B\}$ and $j \in D$. Party P's payoff is

$$V(s^*_P, s^*_{-P}) = \sum_{j \in D} \pi_j(s^*_{P,j}, s^*_{-P,j}) = \frac{1}{2}d.$$

Consider any party $P \in \{A, B\}$ and suppose that they were to deviate to a different strategy $s'_P \neq s^*_P$. Then, there must be a nonempty subset $D' \subseteq D$, such that $k \in D'$ if and only if $s'_{P,k} \neq s^*_{P,k}$. Moreover, for all $k \in D'$, $s'_{P,k} = -i^*_k$ and thus, by (3), $\pi_k(s'_{P,k}, s^*_{-P,k}) = \pi_k(-i^*_k, i^*_k) = 0$, while for all $j \in D - D'$, $\pi_j(s'_{P,j}, s^*_{-P,j}) = \pi_j(s^*_{P,j}, s^*_{-P,j}) = 1/2$. Thus, letting $d' = |D'| > 0$, party P's payoff from this deviation is

$$V(s'_P, s^*_{-P}) = \sum_{j \in D} \pi_j(s'_{P,j}, s^*_{-P,j}) = \frac{1}{2}(d - d') < \frac{1}{2}d = V(s^*_P, s^*_{-P}).$$

That is, deviating to any different strategy $s'_P \neq s^*_P$ is not profitable. Thus, the strategy profile (s^*_A, s^*_B) such that $(s^*_{A,j}, s^*_{B,j}) = (i^*_j, i^*_j)$ for all $j \in D$ is an equilibrium.

Consider any strategy profile $(s_A, s_B) \neq (s^*_A, s^*_B)$. That is, in some district $k \in D$, $(s_{A,k}, s_{B,k}) \neq (i^*_k, i^*_k)$. Party P's payoff is

$$V(s_P, s_{-P}) = \pi_k(s_{P,k}, s_{-P,k}) + \sum_{j \in D, j \neq k} \pi_j(s_{P,j}, s_{-P,j}).$$

There are two cases: either *(a)* both parties select candidates from the minority group $-i^*_k$, i.e., $(s_{P,k}, s_{-P,k}) = (-i^*_k, -i^*_k)$; or *(b)* only one of the two parties selects a candidate from the minority group $-i^*_k$, while the other party selects a candidate from the majority group i^*_k, i.e., for some $P \in \{A, B\}$, $(s_{P,k}, s_{-P,k}) = (-i^*_k, i^*_k)$. Consider each case in turn.

Case (a). If $(s_{P,k}, s_{-P,k}) = (-i^*_k, -i^*_k)$, then by (3), $\pi_k(s_{P,k}, s_{-P,k}) = \pi_k(-i^*_k, -i^*_k) = 1/2$ and

$$V(s_P, s_{-P}) = \pi_k(s_{P,k}, s_{-P,k}) + \sum_{j \in D, j \neq k} \pi_j(s_{P,j}, s_{-P,j}) = \frac{1}{2} + \sum_{j \in D, j \neq k} \pi_j(s_{P,j}, s_{-P,j}).$$

Party P can deviate to strategy s'_P such that $s'_{P,j} = s_{P,j}$ for all $j \in D, j \neq k$ and $s'_{P,k} = i^*_k$. From (3) follows that $\pi_k(s'_{P,k}, s_{-P,k}) = \pi_k(i^*_k, -i^*_k) = 1$ so that

$$V(s'_P, s_{-P}) = 1 + \sum_{j \in D, j \neq k} \pi_j(s_{P,j}, s_{-P,j}) > \frac{1}{2} + \sum_{j \in D, j \neq k} \pi_j(s_{P,j}, s_{-P,j}) = V(s_P, s_{-P}).$$

That is, (s_A, s_B) is not an equilibrium.

Case (b). If $(s_{P,k}, s_{-P,k}) = (-i^*_k, i^*_k)$, then by (3), $\pi_k(s_{P,k}, s_{-P,k}) = \pi_k(-i^*_k, i^*_k) = 0$ and

$$V(s_P, s_{-P}) = \pi_k(s_{P,k}, s_{-P,k}) + \sum_{j \in D, j \neq k} \pi_j(s_{P,j}, s_{-P,j}) = \sum_{j \in D, j \neq k} \pi_j(s_{P,j}, s_{-P,j}).$$

Party P can deviate to strategy s'_P such that $s'_{P,j} = s_{P,j}$ for all $j \in D, j \neq k$ and $s'_{P,k} = i^*_k$. From (3) follows that $\pi_k(s'_{P,k}, s_{-P,k}) = \pi_k(i^*_k, i^*_k) = 1/2$ so that

$$V(s'_P, s_{-P}) = \frac{1}{2} + \sum_{j \in D, j \neq k} \pi_j(s_{P,j}, s_{-P,j}) > \sum_{j \in D, j \neq k} \pi_j(s_{P,j}, s_{-P,j}) = V(s_P, s_{-P}).$$

That is, (s_A, s_B) is not an equilibrium.

Therefore, the strategy profile (s^*_A, s^*_B) such that $(s^*_{A,j}, s^*_{B,j}) = (i^*_j, i^*_j)$ for all $j \in D$ is the unique equilibrium. ■

Proposition 2

Proof. Suppose that $\eta = 0$. Then, the probability of party P winning the seat in district j is given by (4). Consider any strategy profile (s_A, s_B). By (4), $\pi_j(s_{P,j}, s_{-P,j}) = 1/2$ for all $P \in \{A, B\}$ and $j \in D$. Therefore, party P's payoff is

$$V(s_P, s_{-P}) = \sum_{j \in D} \pi_j(s_{P,j}, s_{-P,j}) = \frac{1}{2}d.$$

Consider any deviation by any party $P \in \{A, B\}$ to a strategy $s'_P \neq s_P$. By (4), $\pi_j(s'_{P,j}, s_{-P,j}) = 1/2$ for all $j \in D$. Therefore, party P's payoff from this deviation is

$$V(s'_P, s_{-P}) = \sum_{j \in D} \pi_j(s'_{P,j}, s_{-P,j}) = \frac{1}{2}d = V(s_P, s_{-P}).$$

That is, deviating to any different strategy $s'_P \neq s_P$ is not profitable. Hence, the strategy profile (s_A, s_B) is an equilibrium. Thus, if $\eta = 0$, then every strategy profile (s_A, s_B) is an equilibrium.

Suppose that $\eta > 0$. Then, the probability of party P winning the seat in district j is given by (5). Consider the strategy profile (s^*_A, s^*_B) such that $(s^*_{A,j}, s^*_{B,j}) = (h, h)$ for all

$j \in D$. Then, by (5), $\pi_j(s^*_{P,j}, s^*_{-P,j}) = \pi_j(h,h) = 1/2$ for all $P \in \{A, B\}$ and $j \in D$. Thus, each party P has payoff

$$V(s^*_P, s^*_{-P}) = \sum_{j \in D} \pi_j(s^*_{P,j}, s^*_{-P,j}) = \frac{1}{2}d.$$

Consider any party $P \in \{A, B\}$ and suppose that they were to deviate to a different strategy $s'_P \neq s^*_P$. Then, there must be a nonempty subset $D' \subseteq D$, such that $k \in D'$ if and only if $s'_{P,k} \neq s^*_{P,k}$. Moreover, for all $k \in D'$, $s'_{P,k} = l$ and thus, by (5), $\pi_k(s'_{P,k}, s^*_{-P,k}) = \pi_k(l,h) = 0$, while for all $j \in D - D'$, $\pi_j(s'_{P,j}, s^*_{-P,j}) = \pi_j(s^*_{P,j}, s^*_{-P,j}) = 1/2$. Thus, letting $d' = |D'| > 0$, party P's payoff from this deviation is

$$V(s'_P, s^*_{-P}) = \sum_{j \in D} \pi_j(s'_{P,j}, s^*_{-P,j}) = \frac{1}{2}(d - d') < \frac{1}{2}d = V(s^*_P, s^*_{-P}).$$

That is, deviating to any different strategy $s'_P \neq s^*_P$ is not profitable. Thus, if $\eta > 0$, then the strategy profile (s^*_A, s^*_B) such that $(s^*_{A,j}, s^*_{B,j}) = (h,h)$ for all $j \in D$ is an equilibrium.

Consider any strategy profile $(s_A, s_B) \neq (s^*_A, s^*_B)$. That is, in some district $k \in D$, $(s_{A,k}, s_{B,k}) \neq (h,h)$. Party P's payoff is

$$V(s_P, s_{-P}) = \pi_k(s_{P,k}, s_{-P,k}) + \sum_{j \in D, j \neq k} \pi_j(s_{P,j}, s_{-P,j}).$$

There are two cases: either *(a)* both parties select candidates from the low-income group l, i.e., $(s_{P,k}, s_{-P,k}) = (l,l)$; or *(b)* only one of the two parties selects a candidate from the low-income group l, while the other party selects a candidate from the high-income group h, i.e., for some $P \in \{A, B\}$, $(s_{P,k}, s_{-P,k}) = (l,h)$. Consider each case in turn.

Case (a). If $(s_{P,k}, s_{-P,k}) = (l,l)$, then by (5), $\pi_k(s_{P,k}, s_{-P,k}) = \pi_k(l,l) = 1/2$ and

$$V(s_P, s_{-P}) = \pi_k(s_{P,k}, s_{-P,k}) + \sum_{j \in D, j \neq k} \pi_j(s_{P,j}, s_{-P,j}) = \frac{1}{2} + \sum_{j \in D, j \neq k} \pi_j(s_{P,j}, s_{-P,j}).$$

Party P can deviate to strategy s'_P such that $s'_{P,j} = s_{P,j}$ for all $j \in D, j \neq k$ and $s'_{P,k} = h$. From (5) follows that $\pi_k(s'_{P,k}, s_{-P,k}) = \pi_k(h,l) = 1$ so that

$$V(s'_P, s_{-P}) = 1 + \sum_{j \in D, j \neq k} \pi_j(s_{P,j}, s_{-P,j}) > \frac{1}{2} + \sum_{j \in D, j \neq k} \pi_j(s_{P,j}, s_{-P,j}) = V(s_P, s_{-P}).$$

That is, (s_A, s_B) is not an equilibrium.

Case (b). If $(s_{P,k}, s_{-P,k}) = (l, h)$, then by (5), $\pi_k(s_{P,k}, s_{-P,k}) = \pi_k(l, h) = 0$ and

$$V(s_P, s_{-P}) = \pi_k(s_{P,k}, s_{-P,k}) + \sum_{j\in D, j\neq k} \pi_j(s_{P,j}, s_{-P,j}) = \sum_{j\in D, j\neq k} \pi_j(s_{P,j}, s_{-P,j}).$$

Party P can deviate to strategy s'_P such that $s'_{P,j} = s_{P,j}$ for all $j \in D, j \neq k$ and $s'_{P,k} = h$. From (5) follows that $\pi_k(s'_{P,k}, s_{-P,k}) = \pi_k(h, h) = 1/2$ so that

$$V(s'_P, s_{-P}) = \frac{1}{2} + \sum_{j\in D, j\neq k} \pi_j(s_{P,j}, s_{-P,j}) > \sum_{j\in D, j\neq k} \pi_j(s_{P,j}, s_{-P,j}) = V(s_P, s_{-P}).$$

That is, (s_A, s_B) is not an equilibrium.

Therefore, if $\eta > 0$, then the strategy profile (s^*_A, s^*_B) such that $(s^*_{A,j}, s^*_{B,j}) = (h, h)$ for all $j \in D$ is the unique equilibrium. ■

Proposition 3

Proof. By Propositions 1 and 2, an equilibrium always exists for all $\gamma \geq 1$. Suppose that high-income citizens predominate in the legislature in equilibrium. By contraposition, it follows from Corollary 1 that $\gamma w_l \geq \bar{w}$ must hold, and Corollary 2 verifies that if $\gamma w_l \geq \bar{w}$, then there is an equilibrium such that high-income citizens predominate in the legislature. From $\gamma w_l \geq \bar{w}$ follows that all legislators oppose redistribution, irrespective of their income background. ■

Proposition 4

Proof. The proofs of Propositions 1–2 are unaffected; Corollaries 1–2 follow directly; the proof of Proposition 3 only requires that γ be replaced by $\hat{\gamma}$. ■

Proposition 5

Proof. I consider each case in turn and then establish the last sentence of the proposition.

1. Suppose that $\tilde{\gamma} w_l < \gamma w_l < \bar{w}$. Then, the probability of party P winning the seat in district j is given by (3). The proof is then exactly the same as that of Proposition 1.

2. Suppose that $\gamma w_l > \tilde{\gamma} w_l \geq \bar{w}$. Then, the probability of party P winning the seat in district j is given by (4) if $\eta = 0$ and by (5) if $\eta > 0$. The proof is then exactly the same as that of Proposition 2.

3. Suppose that $\tilde{\gamma} w_l < \bar{w} \leq \gamma w_l$. Then, the probability of party P winning the seat in district $j \in D_l$ is given by (3), while the probability of party P winning the seat in district $j \in D_h$ is given by (4) if $\eta = 0$ and by (5) if $\eta > 0$.

Consider the strategy profile (s^*_A, s^*_B) such that $(s^*_{A,j}, s^*_{B,j}) = (l, l)$ for all $j \in D_l$ and $(s^*_{A,j}, s^*_{B,j}) = (h, h)$ for all $j \in D_h$. By (3), party $P \in \{A, B\}$ wins the seat in all districts $j \in D_l$ with probability $\pi_j(s^*_{P,j}, s^*_{-P,j}) = \pi_j(i^*_j, i^*_j) = 1/2$; by (4) in the case of $\eta = 0$ and by (5) in the case of $\eta > 0$, party $P \in \{A, B\}$ wins the seat in all districts $j \in D_h$ with probability $\pi_j(s^*_{P,j}, s^*_{-P,j}) = \pi_j(h, h) = 1/2$. Thus, party P has payoff

$$V(s^*_P, s^*_{-P}) = \sum_{j \in D} \pi_j(s^*_{P,j}, s^*_{-P,j}) = \frac{1}{2}d.$$

Consider any party $P \in \{A, B\}$ and suppose that they were to deviate to a different strategy $s'_P \neq s^*_P$. Then, there must be a nonempty subset $D' \subseteq D$, such that $k \in D'$ if and only if $s'_{P,k} \neq s^*_{P,k}$. Moreover, for all $k \in D'$, $s'_{P,k} = h = -i^*_k$ if $k \in D_l$, while $s'_{P,k} = l$ if $k \in D_h$. Thus, if $k \in D_l$, then by (3), $\pi_k(s'_{P,k}, s^*_{-P,k}) = \pi_k(-i^*_k, i^*_k) = 0$, while if $k \in D_h$, then by (4), $\pi_k(s'_{P,k}, s^*_{-P,k}) = \pi_k(l, h) = 1/2$ in the case of $\eta = 0$ and by (5), $\pi_k(s'_{P,k}, s^*_{-P,k}) = \pi_k(l, h) = 0$ in the case of $\eta > 0$. That is, for all $k \in D'$, $\pi_k(s'_{P,k}, s^*_{-P,k}) \leq \pi_k(s^*_{P,k}, s^*_{-P,k})$, while for all $j \in D - D'$, $\pi_j(s'_{P,j}, s^*_{-P,j}) = \pi_j(s^*_{P,j}, s^*_{-P,j})$. Therefore, party P's payoff from this deviation is

$$V(s'_P, s^*_{-P}) = \sum_{j \in D} \pi_j(s'_{P,j}, s^*_{-P,j}) \leq \sum_{j \in D} \pi_j(s^*_{P,j}, s^*_{-P,j}) = V(s^*_P, s^*_{-P}).$$

That is, deviating to any different strategy $s'_P \neq s^*_P$ is not profitable. Thus, the strategy profile (s^*_A, s^*_B) such that $(s^*_{A,j}, s^*_{B,j}) = (l, l)$ for all $j \in D_l$ and $(s^*_{A,j}, s^*_{B,j}) = (h, h)$ for all $j \in D_h$ is an equilibrium.

Consider any strategy profile (s_A, s_B) such that in some district $k \in D_l$, $(s_{A,k}, s_{B,k}) \neq (i^*_k, i^*_k) = (l, l)$. The probability of party P winning the seat in district $k \in D_l$ is given by (3). Party P's payoff is

$$V(s_P, s_{-P}) = \pi_k(s_{P,k}, s_{-P,k}) + \sum_{j \in D, j \neq k} \pi_j(s_{P,j}, s_{-P,j}).$$

There are two cases: either *(a)* both parties select candidates from group h, i.e., $(s_{P,k}, s_{-P,k}) = (h, h) = (-i^*_k, -i^*_k)$; or *(b)* only one of the two parties selects a candidate from group h, while the other party selects a candidate from group l, i.e., for some $P \in \{A, B\}$, $(s_{P,k}, s_{-P,k}) = (h, l) = (-i^*_k, i^*_k)$. Consider each case in turn.

Case (a). If $(s_{P,k}, s_{-P,k}) = (-i^*_k, -i^*_k)$, then by (3), $\pi_k(s_{P,k}, s_{-P,k}) = \pi_k(-i^*_k, -i^*_k) = 1/2$ and

$$V(s_P, s_{-P}) = \pi_k(s_{P,k}, s_{-P,k}) + \sum_{j \in D, j \neq k} \pi_j(s_{P,j}, s_{-P,j}) = \frac{1}{2} + \sum_{j \in D, j \neq k} \pi_j(s_{P,j}, s_{-P,j}).$$

Party P can deviate to strategy s'_P such that $s'_{P,j} = s_{P,j}$ for all $j \in D, j \neq k$ and $s'_{P,k} = l = i^*_k$. From (3) follows that $\pi_k(s'_{P,k}, s_{-P,k}) = \pi_k(i^*_k, -i^*_k) = 1$ so that

$$V(s'_P, s_{-P}) = 1 + \sum_{j \in D, j \neq k} \pi_j(s_{P,j}, s_{-P,j}) > \frac{1}{2} + \sum_{j \in D, j \neq k} \pi_j(s_{P,j}, s_{-P,j}) = V(s_P, s_{-P}).$$

That is, (s_A, s_B) is not an equilibrium.

Case (b). If $(s_{P,k}, s_{-P,k}) = (-i^*_k, i^*_k)$, then by (3), $\pi_k(s_{P,k}, s_{-P,k}) = \pi_k(-i^*_k, i^*_k) = 0$ and

$$V(s_P, s_{-P}) = \pi_k(s_{P,k}, s_{-P,k}) + \sum_{j \in D, j \neq k} \pi_j(s_{P,j}, s_{-P,j}) = \sum_{j \in D, j \neq k} \pi_j(s_{P,j}, s_{-P,j}).$$

Party P can deviate to strategy s'_P such that $s'_{P,j} = s_{P,j}$ for all $j \in D, j \neq k$ and $s'_{P,k} = l = i^*_k$. From (3) follows that $\pi_k(s'_{P,k}, s_{-P,k}) = \pi_k(i^*_k, i^*_k) = 1/2$ so that

$$V(s'_P, s_{-P}) = \frac{1}{2} + \sum_{j \in D, j \neq k} \pi_j(s_{P,j}, s_{-P,j}) > \sum_{j \in D, j \neq k} \pi_j(s_{P,j}, s_{-P,j}) = V(s_P, s_{-P}).$$

That is, (s_A, s_B) is not an equilibrium.

Therefore, in every equilibrium, the strategy profile (s^*_A, s^*_B) satisfies $(s^*_{A,j}, s^*_{B,j}) = (l, l)$ for all $j \in D_l$.

As there is an equilibrium in all cases, an equilibrium exists for all $\tilde{\gamma} \geq 1$. Finally, if $\tilde{\gamma} w_l < \bar{w}$, then as shown in *1* and *3*, $(s^*_{A,j}, s^*_{B,j}) = (l, l)$ for all $j \in D_l$ in every equilibrium. Thus, district j's legislator is from group l for all $j \in D_l$. Therefore, the legislature has at least $|D_l|$ legislators from group l and at most $|D_h|$ legislators from group h. Since $|D_l| > |D_h|$, the majority of legislators is from group l. By contraposition, if high-income citizens predominate in the legislature, then $\tilde{\gamma} w_l \geq \bar{w}$ must hold. As shown in *2*, if $\eta = 0$, then there is an equilibrium such that $(s^*_{A,j}, s^*_{B,j}) = (h, h)$ for all $j \in D''$, where $D'' \subseteq D$ is some subset of D such that $|D''| > |D|/2$, so that $|D''| > |D|/2$ legislators, i.e., the majority of legislators, are from group h. If $\eta > 0$, then $(s^*_{A,j}, s^*_{B,j}) = (h, h)$ for all $j \in D$ is the unique equilibrium, so that all legislators are from group h. Thus, if high-income citizens predominate in the legislature in equilibrium, then $\tilde{\gamma} w_l \geq \bar{w}$. It then follows from $\gamma w_l > \tilde{\gamma} w_l \geq \bar{w}$ and $\gamma w_h > \tilde{\gamma} w_h > \bar{w}$ that all legislators oppose redistribution, irrespective of their income background and which district they represent. That is, no legislator supports redistribution. ∎

Lemma 3

Proof. Suppose that $\gamma w_l < \bar{w}$. Every district j has $1/d$ voters. From $\lambda_1 + \lambda_0 = 1$ and $\lambda_1 > \lambda_0$ follows that $\lambda_1 > 1/2$.

Consider any $P \in \{A, B\}$ and $j \in D_l$. From $\mu_l^j + \mu_h^j = 1/d$ and $\mu_l^j > \mu_h^j$ follows that $\mu_l^j > 1/2d$. Fix $s_{P,j} = (l, 1)$. If $s_{-P,j} = (l, 0)$, then $\lambda_1 \mu_l^j$ voters of type $(l, 1)$ and $\lambda_1 \mu_h^j$ voters of type $(h, 1)$ vote for $(l, 1)$ because $\bar{w} + \theta > \bar{w}$. That is, $\lambda_1 \mu_l^j + \lambda_1 \mu_h^j = \lambda_1/d > 1/2d$ voters vote for $(l, 1)$ so that $\pi_j((l, 1), (l, 0)) = 1$. If $s_{-P,j} = (h, 1)$, then $\lambda_1 \mu_l^j$ voters of type $(l, 1)$ vote for $(l, 1)$ because $\bar{w} + \theta > w_l + \eta + \theta$ since $\bar{w} > w_l + \eta$; similarly, $\lambda_0 \mu_l^j$ voters of type $(l, 0)$ vote for $(l, 1)$ because $\bar{w} > w_l + \eta$. That is, $\lambda_1 \mu_l^j + \lambda_0 \mu_l^j = \mu_l^j > 1/2d$ voters vote for $(l, 1)$ so that $\pi_j((l, 1), (h, 1)) = 1$. If $s_{-P,j} = (h, 0)$, then $\lambda_1 \mu_l^j$ voters of type $(l, 1)$ vote for $(l, 1)$ because $\bar{w} + \theta > w_l + \eta$ since $\bar{w} > w_l + \eta$; similarly, $\lambda_0 \mu_l^j$ voters of type $(l, 0)$ vote for $(l, 1)$ because $\bar{w} > w_l + \eta + \theta$. That is, $\lambda_1 \mu_l^j + \lambda_0 \mu_l^j = \mu_l^j > 1/2d$ voters vote for $(l, 1)$ so that $\pi_j((l, 1), (h, 0)) = 1$. Thus, $\pi_j((l, 1), y) = 1$ for all $y \neq (l, 1)$ and $j \in D_l$.

Consider any $P \in \{A, B\}$ and $j \in D_h$. From $\mu_l^j + \mu_h^j = 1/d$ and $\mu_h^j > \mu_l^j$ follows that $\mu_h^j > 1/2d$. Fix $s_{P,j} = (h, 1)$. If $s_{-P,j} = (h, 0)$, then $\lambda_1 \mu_h^j$ voters of type $(h, 1)$ and $\lambda_1 \mu_l^j$ voters of type $(l, 1)$ vote for $(h, 1)$ because $w_i + \eta + \theta > w_i + \eta$. That is, $\lambda_1 \mu_l^j + \lambda_1 \mu_h^j = \lambda_1/d > 1/2d$ voters vote for $(h, 1)$ so that $\pi_j((h, 1), (h, 0)) = 1$. If $s_{-P,j} = (l, 1)$, then $\lambda_1 \mu_h^j$ voters of type $(h, 1)$ vote for $(h, 1)$ because $w_h + \eta + \theta > \bar{w} + \theta$ since $w_h > \bar{w}$; similarly, $\lambda_0 \mu_h^j$ voters of type $(h, 0)$ vote for $(h, 1)$ because $w_h + \eta > \bar{w}$. That is, $\lambda_1 \mu_h^j + \lambda_0 \mu_h^j = \mu_h^j > 1/2d$ voters vote for $(h, 1)$ so that $\pi_j((h, 1), (l, 1)) = 1$. If $s_{-P,j} = (l, 0)$, then $\lambda_1 \mu_h^j$ voters of type $(h, 1)$ vote for $(h, 1)$ because $w_h + \eta + \theta > \bar{w}$; similarly, $\lambda_0 \mu_h^j$ voters of type $(h, 0)$ vote for $(h, 1)$ because $w_h + \eta > \bar{w} + \theta$ since $w_h - \bar{w} > \bar{w} - w_l > \theta$. That is, $\lambda_1 \mu_h^j + \lambda_0 \mu_h^j = \mu_h^j > 1/2d$ voters vote for $(h, 1)$ so that $\pi_j((h, 1), (l, 0)) = 1$. Thus, $\pi_j((h, 1), y) = 1$ for all $y \neq (h, 1)$ and $j \in D_h$. ∎

Lemma 4

Proof. Suppose that $\gamma w_l \geq \bar{w}$ and $\eta = 0$. Every district j has $1/d$ voters. From $\lambda_1 + \lambda_0 = 1$ and $\lambda_1 > \lambda_0$ follows that $\lambda_1 > 1/2$.

Consider any $P \in \{A, B\}$ and $j \in D$. Fix $s_{P,j} = (i_{P,j}, 1)$ for some $i_{P,j} \in \{l, h\}$. If $s_{-P,j} = s_{P,j}$, then $\pi_j((i_{P,j}, 1), (i_{P,j}, 1)) = 1/2$ by (13). Suppose that $s_{-P,j} = (-i_{P,j}, 1)$, where $-i_{P,j} \in \{l, h\} \backslash \{i_{P,j}\}$. Then, the candidates are of types $(l, 1)$ and $(h, 1)$, and all voters are indifferent among them: as $\eta = 0$ and both candidates favor regulation and oppose redistribution once in office, the payoff associated with voting for either candidate is $w_i + \theta$ for voters of types $(l, 1)$ and $(h, 1)$ and w_i for voters of types $(l, 0)$ and $(h, 0)$. Thus, all voters randomize so that a fair coin flip is expected to decide the election and thus $\pi_j((i_{P,j}, 1), (-i_{P,j}, 1)) = 1/2$. That is, $\pi_j((i_{P,j}, 1), (i_{-P,j}, 1)) = 1/2$ for all $(i_{P,j}, i_{-P,j}) \in \{l, h\}^2$. Finally, suppose that $s_{-P,j} = (i_{-P,j}, 0)$ for some $i_{-P,j} \in \{l, h\}$. As $\eta = 0$ and both candidates oppose redistribution once in office irrespective of their income background, for voters of types $(l, 1)$ and $(h, 1)$, the payoff associated with voting for the candidate of type $(i_{P,j}, 1)$ is $w_i + \theta$, while that associated with voting for the candidate of type $(i_{-P,j}, 0)$ is w_i. Therefore, as $w_i + \theta > w_i$, all $\lambda_1 \mu_l^j + \lambda_1 \mu_h^j = \lambda_1/d > 1/2d$ voters of types $(l, 1)$ and $(h, 1)$ vote for the candidate of type

$(i_{P,j}, 1)$, who thus wins the election with certainty. That is, $\pi_j((i_{P,j}, 1), (i_{-P,j}, 0)) = 1$ for all $(i_{P,j}, i_{-P,j}) \in \{l, h\}^2$. ■

Lemma 5

Proof. Suppose that $\gamma w_l \geq \bar{w}$ and $\eta > 0$. Every district j has $1/d$ voters. From $\lambda_1 + \lambda_0 = 1$ and $\lambda_1 > \lambda_0$ follows that $\lambda_1 > 1/2$.

Consider any $P \in \{A, B\}$ and $j \in D$. Fix $s_{P,j} = (h, 1)$. If $s_{-P,j} = (h, 0)$, then $\lambda_1 \mu_h^j$ voters of type $(h, 1)$ and $\lambda_1 \mu_l^j$ voters of type $(l, 1)$ vote for $(h, 1)$ because $w_i + \eta + \theta > w_i + \eta$. That is, $\lambda_1 \mu_l^j + \lambda_1 \mu_h^j = \lambda_1/d > 1/2d$ voters vote for $(h, 1)$ so that $\pi_j((h, 1), (h, 0)) = 1$. If $s_{-P,j} = (l, 1)$, then all λ_1/d voters of types $(h, 1)$ and $(l, 1)$ vote for $(h, 1)$ because $w_i + \eta + \theta > w_i + \theta$ since $\eta > 0$; similarly, all λ_0/d voters of types $(l, 0)$ and $(h, 0)$ vote for $(h, 1)$ because $w_i + \eta > w_i$ since $\eta > 0$. That is, all $\lambda_1/d + \lambda_0/d = 1/d$ voters vote for $(h, 1)$ so that $\pi_j((h, 1), (l, 1)) = 1$. If $s_{-P,j} = (l, 0)$, then $\lambda_1 \mu_h^j$ voters of type $(h, 1)$ and $\lambda_1 \mu_l^j$ voters of type $(l, 1)$ vote for $(h, 1)$ because $w_i + \eta + \theta > w_i$. That is, $\lambda_1 \mu_h^j + \lambda_1 \mu_l^j = \lambda_1/d > 1/2d$ voters vote for $(h, 1)$ so that $\pi_j((h, 1), (l, 0)) = 1$. Thus, $\pi_j((h, 1), y) = 1$ for all $y \neq (h, 1)$ and $j \in D$. ■

Proposition 6

Proof. I consider each case in turn and then establish the last sentence of the proposition.

1. Suppose that $\gamma w_l < \bar{w}$. Consider the strategy profile (s_A^*, s_B^*) such that $(s_{A,j}^*, s_{B,j}^*) = ((i_j^*, 1), (i_j^*, 1))$ for all $j \in D$. Then, by (13), $\pi_j(s_{P,j}^*, s_{-P,j}^*) = \pi_j((i_j^*, 1), (i_j^*, 1)) = 1/2$ for all $P \in \{A, B\}$ and $j \in D$. Party P's payoff is

$$V(s_P^*, s_{-P}^*) = \sum_{j \in D} \pi_j(s_{P,j}^*, s_{-P,j}^*) = \frac{1}{2} d.$$

Consider any party $P \in \{A, B\}$ and suppose that they were to deviate to a different strategy $s'_P \neq s_P^*$. Then, there must be a nonempty subset $D' \subseteq D$ such that $k \in D'$ if and only if $s'_{P,k} \neq s_{P,k}^*$. Moreover, for all $k \in D'$, $s'_{P,k} \neq (i_k^*, 1)$, while $s_{-P,k}^* = (i_k^*, 1)$ and thus, by Lemma 3, $\pi_k(s'_{P,k}, s_{-P,k}^*) = 1 - \pi_k(s_{-P,k}^*, s'_{P,k}) = 1 - \pi_k((i_k^*, 1), s'_{P,k}) = 1 - 1 = 0$, while for all $j \in D - D'$, $\pi_j(s'_{P,j}, s_{-P,j}^*) = \pi_j(s_{P,j}^*, s_{-P,j}^*) = 1/2$. Thus, letting $d' = |D'| > 0$, party P's payoff from this deviation is

$$V(s'_P, s_{-P}^*) = \sum_{j \in D} \pi_j(s'_{P,j}, s_{-P,j}^*) = \frac{1}{2}(d - d') < \frac{1}{2} d = V(s_P^*, s_{-P}^*).$$

That is, deviating to any different strategy $s'_P \neq s_P^*$ is not profitable. Thus, the strategy profile (s_A^*, s_B^*) such that $(s_{A,j}^*, s_{B,j}^*) = ((i_j^*, 1), (i_j^*, 1))$ for all $j \in D$ is an equilibrium.

Consider any strategy profile $(s_A, s_B) \neq (s_A^*, s_B^*)$. That is, in some district $k \in D$, $(s_{A,k}, s_{B,k}) \neq ((i_k^*, 1), (i_k^*, 1))$. Party P's payoff is

$$V(s_P, s_{-P}) = \pi_k(s_{P,k}, s_{-P,k}) + \sum_{j \in D, j \neq k} \pi_j(s_{P,j}, s_{-P,j}).$$

There are two cases: either *(a)* neither party selects a candidate of type $(i_k^*, 1)$, and at least one party wins the seat in district k with probability less than one, i.e., for some $P \in \{A, B\}$, $s_{P,k} \neq (i_k^*, 1)$, $s_{-P,k} \neq (i_k^*, 1)$, and $\pi_k(s_{P,k}, s_{-P,k}) < 1$; or *(b)* only one of the two parties selects a candidate of type $(i_k^*, 1)$, while the other party selects a candidate of some other type, i.e., for some $P \in \{A, B\}$, $s_{P,k} \neq (i_k^*, 1)$, while $s_{-P,k} = (i_k^*, 1)$. Consider each case in turn.

Case (a). If $s_{P,k} \neq (i_k^*, 1)$, $s_{-P,k} \neq (i_k^*, 1)$, and $\pi_k(s_{P,k}, s_{-P,k}) < 1$, then

$$V(s_P, s_{-P}) = \pi_k(s_{P,k}, s_{-P,k}) + \sum_{j \in D, j \neq k} \pi_j(s_{P,j}, s_{-P,j}) < 1 + \sum_{j \in D, j \neq k} \pi_j(s_{P,j}, s_{-P,j}).$$

Party P can deviate to strategy s'_P such that $s'_{P,j} = s_{P,j}$ for all $j \in D, j \neq k$ and $s'_{P,k} = (i_k^*, 1)$. As $s_{-P,k} \neq (i_k^*, 1)$, by Lemma 3, $\pi_k(s'_{P,k}, s_{-P,k}) = \pi_k((i_k^*, 1), s_{-P,k}) = 1$ so that

$$V(s'_P, s_{-P}) = 1 + \sum_{j \in D, j \neq k} \pi_j(s_{P,j}, s_{-P,j}) > V(s_P, s_{-P}).$$

That is, (s_A, s_B) is not an equilibrium.

Case (b). If $s_{P,k} \neq (i_k^*, 1)$ and $s_{-P,k} = (i_k^*, 1)$, then by Lemma 3, $\pi_k(s_{P,k}, s_{-P,k}) = 1 - \pi_k(s_{-P,k}, s_{P,k}) = 1 - \pi_k((i_k^*, 1), s_{P,k}) = 1 - 1 = 0$ and

$$V(s_P, s_{-P}) = \pi_k(s_{P,k}, s_{-P,k}) + \sum_{j \in D, j \neq k} \pi_j(s_{P,j}, s_{-P,j}) = \sum_{j \in D, j \neq k} \pi_j(s_{P,j}, s_{-P,j}).$$

Party P can deviate to strategy s'_P such that $s'_{P,j} = s_{P,j}$ for all $j \in D, j \neq k$ and $s'_{P,k} = (i_k^*, 1)$. As $s_{-P,k} = (i_k^*, 1)$, $\pi_k(s'_{P,k}, s_{-P,k}) = \pi_k((i_k^*, 1), (i_k^*, 1)) = 1/2$ by (13) so that

$$V(s'_P, s_{-P}) = \frac{1}{2} + \sum_{j \in D, j \neq k} \pi_j(s_{P,j}, s_{-P,j}) > \sum_{j \in D, j \neq k} \pi_j(s_{P,j}, s_{-P,j}) = V(s_P, s_{-P}).$$

That is, (s_A, s_B) is not an equilibrium.

Therefore, the strategy profile (s_A^*, s_B^*) such that $(s_{A,j}^*, s_{B,j}^*) = ((i_j^*, 1), (i_j^*, 1))$ for all $j \in D$ is the unique equilibrium.

2. Suppose that $\gamma w_l \geq \bar{w}$. Suppose that $\eta = 0$. Consider any strategy profile (s_A^*, s_B^*) such that for all $j \in D$, $(s_{A,j}^*, s_{B,j}^*) = ((i_{A,j}, 1), (i_{B,j}, 1))$ for some $(i_{A,j}, i_{B,j}) \in \{l, h\}^2$. By Lemma 4, $\pi_j((i_{A,j}, 1), (i_{B,j}, 1)) = 1/2$ for all $j \in D$. Party P's payoff is

$$V(s_P^*, s_{-P}^*) = \sum_{j \in D} \pi_j(s_{P,j}^*, s_{-P,j}^*) = \frac{1}{2}d.$$

Consider any party $P \in \{A, B\}$ and suppose that they were to deviate to a different strategy $s'_P \neq s_P^*$. Then, there must be a nonempty subset $D' \subseteq D$ such that $k \in D'$ if and only if $s'_{P,k} \neq s_{P,k}^* = (i_{P,k}, 1)$. Moreover, for all $k \in D'$, $s'_{P,k} \in \{(-i_{P,k}, 1), (i_{P,k}, 0), (-i_{P,k}, 0)\}$, where $-i_{P,k} \in \{l, h\} \backslash \{i_{P,k}\}$, while $s_{-P,k}^* = (i_{-P,k}, 1)$ and, by Lemma 4 and $\pi_k(s'_{P,k}, s_{-P,k}^*) = 1 - \pi_k(s_{-P,k}^*, s'_{P,k})$, $\pi_k(s'_{P,k}, s_{-P,k}^*) \leq 1/2$. That is, for all $k \in D'$, $\pi_k(s'_{P,k}, s_{-P,k}^*) \leq \pi_k(s_{P,k}^*, s_{-P,k}^*)$, while for all $j \in D - D'$, $\pi_j(s'_{P,j}, s_{-P,j}^*) = \pi_j(s_{P,j}^*, s_{-P,j}^*)$. Therefore, party P's payoff from this deviation is

$$V(s'_P, s_{-P}^*) = \sum_{j \in D} \pi_j(s'_{P,j}, s_{-P,j}^*) \leq \sum_{j \in D} \pi_j(s_{P,j}^*, s_{-P,j}^*) = V(s_P^*, s_{-P}^*).$$

That is, deviating to any different strategy $s'_P \neq s_P^*$ is not profitable. Thus, if $\eta = 0$, then every strategy profile (s_A^*, s_B^*) such that for all $j \in D$, $(s_{A,j}^*, s_{B,j}^*) = ((i_{A,j}, 1), (i_{B,j}, 1))$ for some $(i_{A,j}, i_{B,j}) \in \{l, h\}^2$ is an equilibrium.

Suppose that $\eta > 0$. Consider the strategy profile (s_A^*, s_B^*) such that $(s_{A,j}^*, s_{B,j}^*) = ((h, 1), (h, 1))$ for all $j \in D$. Then, by (13), $\pi_j(s_{P,j}^*, s_{-P,j}^*) = \pi_j((h, 1), (h, 1)) = 1/2$ for all $P \in \{A, B\}$ and $j \in D$. Party P's payoff is

$$V(s_P^*, s_{-P}^*) = \sum_{j \in D} \pi_j(s_{P,j}^*, s_{-P,j}^*) = \frac{1}{2}d.$$

Consider any party $P \in \{A, B\}$ and suppose that they were to deviate to a different strategy $s'_P \neq s_P^*$. Then, there must be a nonempty subset $D' \subseteq D$ such that $k \in D'$ if and only if $s'_{P,k} \neq s_{P,k}^*$. Moreover, for all $k \in D'$, $s'_{P,k} \neq (h, 1)$, while $s_{-P,k}^* = (h, 1)$ and thus, by Lemma 5, $\pi_k(s'_{P,k}, s_{-P,k}^*) = 1 - \pi_k(s_{-P,k}^*, s'_{P,k}) = 1 - \pi_k((h, 1), s'_{P,k}) = 1 - 1 = 0$, while for all $j \in D - D'$, $\pi_j(s'_{P,j}, s_{-P,j}^*) = \pi_j(s_{P,j}^*, s_{-P,j}^*) = 1/2$. Thus, letting $d' = |D'| > 0$, party P's payoff from this deviation is

$$V(s'_P, s_{-P}^*) = \sum_{j \in D} \pi_j(s'_{P,j}, s_{-P,j}^*) = \frac{1}{2}(d - d') < \frac{1}{2}d = V(s_P^*, s_{-P}^*).$$

That is, deviating to any different strategy $s'_P \neq s_P^*$ is not profitable. Thus, the strategy profile (s_A^*, s_B^*) such that $(s_{A,j}^*, s_{B,j}^*) = ((h, 1), (h, 1))$ for all $j \in D$ is an equilibrium.

Consider any strategy profile $(s_A, s_B) \neq (s_A^*, s_B^*)$. That is, in some district $k \in D$,

$(s_{A,k}, s_{B,k}) \neq ((h,1),(h,1))$. Party P's payoff is

$$V(s_P, s_{-P}) = \pi_k(s_{P,k}, s_{-P,k}) + \sum_{j\in D, j\neq k} \pi_j(s_{P,j}, s_{-P,j}).$$

There are two cases: either *(a)* neither party selects a candidate of type $(h,1)$, and at least one party wins the seat in district k with probability less than one, i.e., for some $P \in \{A,B\}$, $s_{P,k} \neq (h,1)$, $s_{-P,k} \neq (h,1)$, and $\pi_k(s_{P,k}, s_{-P,k}) < 1$; or *(b)* only one of the two parties selects a candidate of type $(h,1)$, while the other party selects a candidate of some other type, i.e., for some $P \in \{A,B\}$, $s_{P,k} \neq (h,1)$, while $s_{-P,k} = (h,1)$. Consider each case in turn.

Case (a). If $s_{P,k} \neq (h,1)$, $s_{-P,k} \neq (h,1)$, and $\pi_k(s_{P,k}, s_{-P,k}) < 1$, then

$$V(s_P, s_{-P}) = \pi_k(s_{P,k}, s_{-P,k}) + \sum_{j\in D, j\neq k} \pi_j(s_{P,j}, s_{-P,j}) < 1 + \sum_{j\in D, j\neq k} \pi_j(s_{P,j}, s_{-P,j}).$$

Party P can deviate to strategy s'_P such that $s'_{P,j} = s_{P,j}$ for all $j \in D, j \neq k$ and $s'_{P,k} = (h,1)$. As $s_{-P,k} \neq (h,1)$, by Lemma 5, $\pi_k(s'_{P,k}, s_{-P,k}) = \pi_k((h,1), s_{-P,k}) = 1$ so that

$$V(s'_P, s_{-P}) = 1 + \sum_{j\in D, j\neq k} \pi_j(s_{P,j}, s_{-P,j}) > V(s_P, s_{-P}).$$

That is, (s_A, s_B) is not an equilibrium.

Case (b). If $s_{P,k} \neq (h,1)$ and $s_{-P,k} = (h,1)$, then by Lemma 5, $\pi_k(s_{P,k}, s_{-P,k}) = 1 - \pi_k(s_{-P,k}, s_{P,k}) = 1 - \pi_k((h,1), s_{P,k}) = 1 - 1 = 0$ and

$$V(s_P, s_{-P}) = \pi_k(s_{P,k}, s_{-P,k}) + \sum_{j\in D, j\neq k} \pi_j(s_{P,j}, s_{-P,j}) = \sum_{j\in D, j\neq k} \pi_j(s_{P,j}, s_{-P,j}).$$

Party P can deviate to strategy s'_P such that $s'_{P,j} = s_{P,j}$ for all $j \in D, j \neq k$ and $s'_{P,k} = (h,1)$. As $s_{-P,k} = (h,1)$, by (13), $\pi_k(s'_{P,k}, s_{-P,k}) = \pi_k((h,1),(h,1)) = 1/2$ so that

$$V(s'_P, s_{-P}) = \frac{1}{2} + \sum_{j\in D, j\neq k} \pi_j(s_{P,j}, s_{-P,j}) > \sum_{j\in D, j\neq k} \pi_j(s_{P,j}, s_{-P,j}) = V(s_P, s_{-P}).$$

That is, (s_A, s_B) is not an equilibrium.

Therefore, if $\eta > 0$, then the strategy profile (s^*_A, s^*_B) such that $(s^*_{A,j}, s^*_{B,j}) = ((h,1),(h,1))$ for all $j \in D$ is the unique equilibrium.

As there is an equilibrium in each case, an equilibrium exists for all $\gamma \geq 1$. Finally, if

$\gamma w_l < \bar{w}$, then as shown in *1*, in equilibrium, $(s^*_{A,j}, s^*_{B,j}) = ((l,1),(l,1))$ for all $j \in D_l$, while $(s^*_{A,j}, s^*_{B,j}) = ((h,1),(h,1))$ for all $j \in D_h$. Thus, district j's legislator is from group l for all $j \in D_l$ and from group h for all $j \in D_h$. Therefore, the legislature has $|D_l|$ legislators from group l and $|D_h|$ legislators from group h. Since $|D_l| > |D_h|$, the majority of legislators is from group l. By contraposition, if high-income citizens predominate in the legislature, then $\gamma w_l \geq \bar{w}$ must hold. As shown in *2*, if $\eta = 0$, then there is an equilibrium such that $(s^*_{A,j}, s^*_{B,j}) = ((h,1),(h,1))$ for all $j \in D''$, where $D'' \subseteq D$ is some subset of D such that $|D''| > |D|/2$, so that $|D''| > |D|/2$ legislators, i.e., the majority of legislators, are from group h. If $\eta > 0$, then $(s^*_{A,j}, s^*_{B,j}) = ((h,1),(h,1))$ for all $j \in D$ in the unique equilibrium, so that all legislators are from group h. Thus, if high-income citizens predominate in the legislature in equilibrium, then $\gamma w_l \geq \bar{w}$. It then follows from $\gamma w_h > \gamma w_l \geq \bar{w}$ that all legislators oppose redistribution, irrespective of their income background. That is, no legislator supports redistribution. ■

Proposition 7

Proof. The proofs of Propositions 1–2 are unaffected; Corollaries 1–2 follow directly; the proof of Proposition 3 is unaffected. ■

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