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Abstract[1]

What explains significant variation across countries in the use of vote buying instead of campaign promises to secure voter support? This paper explicitly models the tradeoff parties face between engaging in vote buying and making campaign promises, and explores the distributional consequences of this decision, in a setting where party credibility can vary. When parties are less credible they spend more on vote buying and target vote buying more heavily toward groups that do not believe campaign promises. When political credibility is sufficiently low, some voter groups are targeted only with vote buying and not with promises of post-electoral transfers. Stronger electoral competition reduces rent seeking but increases vote buying. Incumbents may have an advantage in undertaking vote buying; the paper finds that in a dynamic setting the prospect of a future incumbency advantage increases current vote buying.

JEL classifications: D72, H20, H50, O10
Keywords: Vote buying, Campaign promises, Credibility, Rent seeking

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1 Introduction

Vote buying is an archetype of the clientelist exchange of favors between individual politicians and voters (e.g., Kitschelt and Wilkinson 2007). Scholars have long grappled with its modalities, especially with the question of how politicians ensure that citizens deliver the votes that they sell (e.g., Stokes 2005; Stokes et al. 2013). However, assuming vote buying is effective, politicians must decide whether to undertake it. This decision has received less attention. Under what conditions do politicians prefer to woo voters with pre-electoral clientelist transfers rather than promises of post-electoral clientelist transfers?[2] Existing models of political competition do not address this issue. Typically, they assume that voters make their choices based on the credible pre-electoral promises of political competitors (ex ante voting rules) or that voters implicitly coordinate on a performance threshold of incumbent performance and reelect incumbents who meet that threshold (ex post voting rules). The former requires voters to believe politician promises. The latter assumes that voters can coordinate on a performance threshold. By definition, though, vote buying entails no promises of post-electoral transfers. On the contrary, it appears to thrive in environments with limited political credibility and low voter coordination.

We present a model that addresses several questions surrounding vote buying. First, it responds to the question above, demonstrating that vote buying is greater in environments where political competitors are less able to make credible commitments to voters. This is similar to Keefer and Vlaicu's (2008) finding that parties promise larger post-electoral targeted transfers when credibility is lower. However, the two strategies are not interchangeable: parties often buy votes from groups to which they cannot credibly commit to deliver post-electoral transfers.

Second, we examine the distributional implications of vote buying, which have also attracted significant attention. Kitschelt (2000) conjectures that some groups targeted with vote buying would not, in fact, receive any government transfers in the event that vote buying were banned. Brusco et al. (2004), like many analysts of young democracies, see vote buying as distinctly corrosive. However, we show that it is the conditions under which vote buying emerges, namely weak political credibility, rather than vote buying itself, that produce incentives for rent seeking. Moreover, and consistent with Kitschelt's conjecture, under these conditions electoral competition stimulates additional vote buying. At the same

[2] The same question applies to the closely related phenomenon of "turnout buying" (Nichter, 2008): why do politicians "purchase" turnout with pre-electoral transfers rather than with promises of post-electoral transfers?

time, it reduces rent seeking. This result is notable, since vote buying is often discussed in the same terms as rent seeking and corruption. Our analysis shows how these behaviors arise as strategic party responses to electoral competition under conditions of limited credibility.

Third, asymmetries between parties in the ability to fund vote buying may induce an incumbency advantage. We investigate incumbent and challenger behavior, in both single and multiple election settings, assuming incumbents are better able to finance vote buying than challengers. In a single election, incumbents respond to their financing advantage by increasing both vote buying and rent seeking; challengers, seeking to offset the incumbent's advantage, moderate rent seeking, i.e., reduce the resources that they divert to their own benefit after fulfilling their tax and spending promises. In a dynamic extension, the first election presents no incumbent advantage but the winner enjoys a financing advantage in the second election through access to public funds. The prospect of high rents after the second election leads parties to moderate their rent demands in the first; vote buying, however, increases in the first election, since a future incumbency advantage raises the stakes of the first election, inducing candidates to devote more resources to winning it.

Fourth, a key issue in democratic development is the conditions under which programmatic political parties emerge that can make credible commitments to all citizens. Credible political parties have better incentives to deliver broad-based public goods because their public good promises have electoral impact with a larger fraction of the electorate. Similarly, in our model below credible campaign promises have higher electoral impact, reducing party reliance on vote buying. This mechanism points to a potential reason for the slow development of credible political parties: the policy differences between high and low crediblity parties have distributional consequences. In particular, voters benefitting from vote buying in a low credibility environment may be better off than in a higher credibility environment with lower taxes and rent seeking but no vote buying or other transfers. Thus, they have little incentive to support the development of programmatic parties.

The next section presents stylized facts regarding vote buying and reviews previous research analyzing the phenomenon. That research points to the plausibility of our argument that cross-country variation in vote buying can be traced in part to the lack of credibility of parties' campaign promises. We then present the model, examine the robustness of our findings in settings where incumbents enjoy an advantage and in which there are multiple elections, and discuss implications of this work for future research and policies.

2 Previous Explanations of Vote Buying

Vote buying is a common practice in many democratic elections, yet its prevalence and the resources involved vary widely across countries. Wave 6 (2010-2012) of the World Values Survey asked respondents in a global sample of countries to assess the frequency of vote buying. The data show substantial variation across country groups, from 12 percent in OECD to 56 percent in South Asia, and even wider variation across individual countries, from 5 percent in the Netherlands to 82 percent in Brazil. Vote buying transfer estimates put forward by different researchers range from 0.2 percent of government spending in the United States to 13 percent in the Philippines. These statistics raise the question of why countries vary in the degree to which politicians prefer to mobilize support through vote buying rather than promises of post-electoral transfers. We advance the argument that this variation has its roots in different degrees of credibility of political parties' policy commitments.

The association of vote buying with the inability of political parties to make programmatic commitments is widely recognized, although not systematically analyzed in the literature. Kitschelt (2000), for example, concludes that vote buying is more common in countries with non-programmatic political parties. Brusco et al. (2004) present evidence that Argentine machine parties target vote buying to voters who are likely to be most skeptical of the party's promises, implying that even organized parties may engage in vote buying to mobilize the support of those voters least likely to believe their promises. Reports of vote buying in the United States, as in Argentina, reflect the incentives of well-organized parties to identify "floaters" and core voters (e.g., Cox and Kousser, 1981). However, the literature also emphasizes that immigrants – those least likely to believe the promises of political parties with which they had scant previous acquaintance and no "identification" – were also preferentially targeted for vote buying (Argersinger, 1985).[3]

Keefer and Vlaicu (2008) argue that variation across countries in the reliance of politicians on clientelist transfers, as opposed to public goods, can be linked to the limited ability of politicians to make credible policy commitments to voters. The analysis here shares elements of their model, particularly the focus on modeling the consequences of variation in politician credibility. However, their analysis examines only promises of post-electoral transfers and hence cannot address the key question of why candidates would prefer pre-election vote buying over post-election transfers. It is similarly silent on the distributional effects of vote

[3] Cornwell (1964: 27) describes party machines as "virtually the only agency facilitating the political – and economic – integration of immigrants into the American community."

buying versus post-electoral transfers. The model here also goes beyond the symmetric and static setting of Keefer and Vlaicu (2008) to incorporate financing asymmetries and dynamic incentives. We show that incumbency and inter-temporal tradeoffs can reinforce parties' incentives to buy votes.

Cruz, Keefer, and Labonne (2014) examine the effects of information shocks that reveal what incumbents can do for voters. They find that those shocks increase vote buying, as incumbents rush to make pre-electoral transfers to satisfy shock-induced increases in voter demands. They interpret these results through the lens of a retrospective voting model that, consistent with the electoral environment in the Philippines, assumes that no politicians can make credible commitments to voters. In the model below we allow party credibility to vary. Hanusch and Keefer (2014) conjecture that government spending just prior to an election could be a form of vote buying and support this conjecture with evidence that the variation in political budget cycles across countries can be explained by political party characteristics, such as party age, that capture the credibility of their electoral commitments. Here we formalize their conjecture.

Most research on vote buying examines its modalities and how politicians and voters can make a credible trade of money for votes. Although vote buying politicians appear to tolerate substantial "leakage," i.e., voters who do not necessarily vote for the politicians who pay them, as in Schaffer (2007), it is nevertheless the case that they would prefer a higher vote yield from their vote buying efforts than a lower yield. Indirectly, this work suggests that variations in vote buying can be found in differences in its transactions costs. For example, costs of using social networks to track voter behavior (Cruz, 2013); carbon paper, cell phones, and other modalities that turn the vote buying transaction into a spot market or simultaneous transaction (Schaffer, 2007); the use of patrons to buy voting blocs whose collective behavior can be observed (Brusco et al., 2004); and the targeting of voters with a strong sense of reciprocity (Finan and Schechter, 2012). However, while the literature has not investigated this question, vote buying appears to be *least* prevalent in countries where politicians have the greatest access to technology and data to track individual voters.

Our analysis also relates to two normative analyses of vote buying. Dekel et al. (2008) analyze the efficiency and distributional differences between pre-electoral vote buying, where campaign promises are not possible, and voter mobilization that relies on campaign promises, where vote buying is not possible. They do not address the conditions that promote politician reliance on one mobilization strategy versus the other. In contrast to the analysis below, politicians do not choose whether to buy votes or make promises, and campaign promises are

always credible. As in the analysis below, they predict that politicians obtain higher rents when electoral competition rests on pre-electoral vote buying, but the underlying mechanism in their analysis is unrelated to the ability of politicians to make credible commitments.

Dal Bó (2007) shows that when principals can credibly promise to pay committee members contingent on their vote, the rents of committee members are reduced. The analysis here concerns the efforts of politicians to persuade voters who do not believe their promises and yields the opposite prediction: vote buying increases the income of those whose votes are bought relative to what they would have received if vote buying were not possible.

3 Model

Elements of the basic setup are standard. We start with a probabilistic voting framework with heterogeneous groups, as in Dixit and Londregan (1996). The electorate consists of a continuum of groups of measure N, each group of measure one and indexed by the variable $m \in [0, N]$. All citizens have the same income, normalized to one. Two political parties, A and B, compete for power. Voter i in group m has a partisan bias given by $\sigma_i(m)$. Positive values indicate that voter i favors party B; negative values, party A. As is usual, to deliver a closed form solution the bias in group m is assumed to have density $\phi(m)$, distributed uniformly over the interval $\left[-\frac{1}{2\phi(m)}, \frac{1}{2\phi(m)}\right]$. Parties know the distribution of partisan bias of each group, but this distribution is subject to a pre-electoral shock that parties do not observe. This shock, denoted δ, is also distributed uniformly, over the interval $\left[-\frac{1}{2\psi}, \frac{1}{2\psi}\right]$. Without loss of generality, the group index m is ordered such that the density of groups falls as the index rises. That is, groups are ordered from those with the highest density, i.e., voters who are easiest to persuade with transfers and public goods, to those with the lowest.[4]

We assume that only voters in groups $m \in [0, n]$, where $0 < n < N$, believe parties' campaign promises: parties can only make credible commitments to this subset of voters regarding transfers, public good provision, and taxes. The parameter n is then a measure of parties' credibility with the electorate.[5] Since groups are ordered from the most to the least

[4] The introduction of groups with these ideological characteristics ensures that politicians compete for the support of all citizens and their optimization problem is continuous with respect to the provision of targeted transfers to some parts of society and not others. This formulation has an intuitive interpretation, however. Groups can, for example, be thought of as geographic jurisdictions with citizens who have heterogeneous partisan tendencies. Within groups, members could have different partisan inclinations for many reasons, including within-group ethnic or religious heterogeneity or because group members belong to different clans.

[5] This allows for clientelist politicians to nevertheless be fiscally responsible, since to be otherwise would

persuadable, i.e., from the highest to the lowest $\phi(m)$, groups that believe political promises are more persuadable than groups that do not. This natural ordering is consistent with the model of Keefer and Vlaicu (2008), where parties may invest in building their credibility with some groups and not others. They show it is most cost-effective for parties to invest first in their credibility with those groups that are most persuadable.[6]

A policy vector $\mathbf{p}_t = \left([k_t(m)]_{m\in[0,N]}, \tau_{t+1}, [f_{t+1}(m)]_{m\in[0,N]}, g_{t+1}, r_{t+1} \right)$ determines the post-election welfare of voter i belonging to group m as follows:

$$\begin{aligned} W_i(\mathbf{p}_t) &= K\left[k_t(m)\right] + \beta\left\{1 - \tau_{t+1} + F\left[f_{t+1}(m)\right] + G\left(g_{t+1}\right)\right\} \quad (1) \\ &= W_t(m) + \beta W_{t+1}(m) \quad (2) \end{aligned}$$

Voter welfare is a function of pre-electoral transfers to his group $k_t(m)$, post-electoral transfers $f_{t+1}(m)$, post-electoral public good spending g_{t+1}, and post-electoral taxes τ_{t+1}. The functions K, F, G are strictly increasing, strictly concave, and differentiable, with $K(0) = F(0) = G(0) = 0$. They can be interpreted as production functions converting budgetary resources into goods and services voters value. Each function may thus reflect a different type of deadweight loss, e.g., to disburse money for vote buying a party must bear the cost of maintaining a broker network. The parameter β is a discount factor, with $0 < \beta \leq 1$.

The pre-election electoral support of voter i for party $j = A, B$ is a function of the policies of the party $\mathbf{p}_t^j$, the voter's idiosyncratic partisan bias $\sigma_i(m)$, and the popularity shock δ:

$$\begin{aligned} V_i(\mathbf{p}_t^j) &= K\left[k_t^j(m)\right]\mathbf{1}_{i\in\hat{m}} + \beta\left\{1 - \tau_{t+1}^j + F\left[f_{t+1}^j(m)\right] + G\left(g_{t+1}^j\right)\right\}\mathbf{1}_{m\in[0,n]} \\ &\quad + \left[\sigma_i\left(m\right) + \delta\right]\mathbf{1}_{j=B} \quad (3) \end{aligned}$$

The first term reflects the fact that vote buying transfers $k_t^j(m)$ do not affect the behavior of all voters in group m, but only a strict subset $\hat{m} \subset m$ of responsive voters, where $\hat{m}$ is of measure $\eta \in (0,1)$, for all $m \in [0, N]$; recall that each group m has measure one. This assumption captures the limited ability of parties to enforce vote buying exchanges with all members of a group; for example, they are able to monitor the voting behavior of only some group members. It recognizes that politicians do not have representatives everywhere

imply breaking their taxing and spending commitments to those voters who believe them.

[6] The assumption is not, however, necessary for the conclusions of the analysis below to hold. On the contrary, by allowing politicians to make credible commitments to the most persuadable groups, the analysis creates a bias against finding any vote buying. The discussion around Propositions 2 and 3 makes clear that their conclusions are strengthened under two plausible alternative assumptions about the preference distributions within groups that believe political promises.

who can easily monitor the voting behavior of all citizens; see Stokes (2005) for a seminal analysis of voter monitoring and Stokes et al. (2013) on the role of brokers. The lower the responsiveness η of voters to vote buying, the less inclined parties are to use vote buying.

The assumption that η is the same across parties may be inconsistent with some country cases. The Peronists of Argentina, for example, have historically been better able than their opponents to make pre-electoral transfers. However, this feature of the model is consistent with experiences in many other countries. In sub-Saharan Africa, East Asia, or Central America, it is more likely the case that no party has a well-established machine. The core analysis below assumes that parties are equally able to buy votes; in the extensions we explore the implications of one way of relaxing this assumption.

Party j's electoral payoff, given party strategies $(\mathbf{p}_t^A, \mathbf{p}_t^B)$, is the quasilinear function:

$$U_t^j = \left[D - \int_0^N k_t^j(m)dm\right] + \beta \mathbb{P}\left\{win_t^j\right\}\left[E + R\left(r_{t+1}^j\right)\right] \tag{4}$$

where $E > 0$ is an ego rent from holding office, r_{t+1}^j are monetary rents, and R is a strictly increasing and strictly concave differentiable function, with $R(0) = 0$. The function R captures potential leakage when turning budgetary resources into private politician consumption, e.g., kickbacks for awarding government contracts. The constant D is a party's campaign fund that can be used to finance pre-electoral transfers $k_t^j(m)$. The condition $\int_0^N k_t^j(m)dm \leq D$ can be imposed to capture the idea that vote buying has to be fully funded. Party j's budget constraint is given by

$$N\tau_{t+1}^j \geq \int_0^N f_{t+1}^j(m)dm + g_{t+1}^j + r_{t+1}^j \tag{5}$$

namely post-electoral transfers, public goods, and rents are financed through a uniform tax.

The timing of the game is as follows. At time t parties simultaneously announce policy vectors $\mathbf{p}_t^A$ and $\mathbf{p}_t^B$ and carry out their vote-buying strategies; the election takes place, and voters pick their preferred party. At time $t+1$ the winning party implements the rest of the policy vector announced prior to the election.

In the Technical Appendix we show that party j's winning probability in equation (4) depends on its policy and its opponent $-j$'s policy as follows:

$$\begin{aligned}\mathbb{P}\left\{win_t^j\right\} &= \frac{1}{2} + \frac{\psi}{\int_0^N \phi(m)\,dm}\left[\eta\int_0^N \left[W_t^j(m) - W_t^{-j}(m)\right]\phi(m)\,dm\right. \\ &\quad \left. + \beta\int_0^n \left[W_{t+1}^j(m) - W_{t+1}^{-j}(m)\right]\phi(m)\,dm\right]\end{aligned} \tag{6}$$

for $j = A, B$. A party's winning chances depend on the voter welfare it can provide relative to its opponent: pre-election welfare, due to vote buying transfers, and post-election welfare, due to fiscal policy impacts on voters who believe campaign promises; see equations (1)-(2).

The setup of the model highlights key differences in the tradeoffs parties confront between engaging in vote buying and making campaign promises. Both electoral strategies increase voter welfare, boosting a party's chances of winning. Vote buying does so by increasing pre-election voter welfare $W_t^j(m) = K\left[k_t^j(m)\right]$. Promises of post-electoral transfers increase post-election voter welfare through $F\left[f_{t+1}^j(m)\right]$, which is part of $W_{t+1}^j(m)$. Parties purchase the benefits of vote buying at the expense of their own resources D, since parties themselves finance these pre-electoral transfers; in the extensions we allow the incumbent party to finance vote buying out of the government budget. The benefits from post-electoral transfers come at the expense of voters, whose tax obligations finance parties' post-election policy commitments.[7]

An equilibrium is a pair of party strategies that are mutual best responses. We focus on interior equilibria in pure strategies. An equilibrium exists because the objective functions are jointly continuous in both parties' strategies, and concave in a party's own strategy. Equilibrium uniqueness follows from the strict concavity of parties' objectives in own strategies; see equations (4) and (6).

4 Vote Buying and Party Credibility

This section uses the model to shed light on electoral strategies in this environment with limited credibility, in particular on the tradeoff parties face between buying votes and making campaign promises. We first provide a characterization of the equilibrium in the symmetric one-election setting introduced above; we indicate equilibrium quantities with an asterisk

[7] The quasilinear party payoff function in equation (4) allows us to explicitly model the reliance of parties on self-financing to fund vote buying. Alternatively, we could remain agnostic about the sources of financing and specify parties' payoff as:

$$U_t^j = \mathbb{P}\left\{win_t^j\right\}\left[E + R\left(r_{t+1}^j\right) - \int_0^N k_t^j(m)dm\right] \tag{7}$$

Here, the appropriate the the constraint on financing vote buying is that it not exceed the rents that the parties expect should they take office, formally $\int_0^N k_t^j(m)dm \leq R\left(r_{t+1}^j\right)$. Propositions 1-5 below are unchanged if we substitute the objective function of equation (7). This objective function is inappropriate for the problem analyzed in Propositions 6-7, however, which explicitly consider asymmetries in the ability of incumbents and challengers to finance vote buying.

(*). Then we show how party credibility and electoral competitiveness affect the resources parties deploy and the groups they target. Proofs of all propositions are in the Technical Appendix.

Proposition 1 (Equilibrium) *In an electoral equilibrium both parties engage in vote buying until its marginal benefit drops below its monetary cost. Parties make campaign promises of targeted transfers and nontargeted public goods until their marginal electoral benefit equals their marginal electoral cost. Transfer promises are made only to those voter groups that believe them,* $f^*_{t+1}(m) > 0$ *if and only if* $m \in [0, n]$. *Parties extract rents from public funds such that the marginal return to rent seeking equals its marginal cost.*

The equilibrium conditions mentioned in this proposition are presented formally in equations (26)-(29) in the Technical Appendix. Together they form a system of four equation types that, together with the binding budget condition in equation (5), implicitly determine the equilibrium policy vector of a party. These equations will be used below to derive comparative statics with respect to key parameters of the model.

Political credibility affects both the amount of vote buying that parties direct to each targeted group (the intensive margin) and the share of groups targeted with vote buying (the extensive margin). The parties use both margins of adjustment in order to increase their expected rents. At the same time, the parties balance their vote buying strategies against their campaign promises, in particular, which groups to target with vote buying versus which groups to cater to with targeted transfers; again the objective is to increase expected rents.

Proposition 2 (Intensive Margin) *Reduced credibility* n *increases parties' spending for both vote buying* $k^*_t(m)$ *and transfer promises* $f^*_{t+1}(m)$*, within each targeted group* m*, and leads to more rent seeking* r^*_{t+1}.

The intuition behind Proposition 1 rests on the observation that, when a party's promises are less credible, the electoral cost of extracting rents, i.e., the higher expected taxes needed to pay for those rents, goes down. Equilibrium rents therefore increase. As rents increase, a party's return to winning increases, making it profitable to increase winning chances by spending more on both vote buying and targeted transfers.

Since changes in credibility imply a shift in the groups that believe political promises, changes in credibility may also affect which groups are targeted with transfers, i.e., groups in the set $\left\{m \in [0, N] \,|\, f^*_{t+1}(m) > 0\right\}$. Proposition 2 showed that the effects of credibility on how much any one group receives in transfers are symmetrical across vote buying and post-electoral transfers. Proposition 3 demonstrates that the effects of credibility on which groups receive transfers may be asymmetrical across vote buying and post-electoral transfers.

Proposition 3 (Extensive Margin) *If credibility n is low enough to satisfy the inequality $F'(0)\,\phi(n) \geq \frac{1}{N}\int_0^n \phi(m)\,dm$, then reduced credibility increases the share of groups $m \in \left[0, m^k\right]$ targeted with vote buying and decreases the share of groups $m \in \left[0, m^f\right]$ promised post-electoral transfers. Otherwise, reduced credibility increases both the share of groups targeted with vote buying and those promised post-electoral transfers.*

When party credibility is sufficiently low, reduced credibility makes it profitable to target additional groups with vote buying, but fewer groups with post-electoral transfers. The intuition is that when credibility is sufficiently low, the few groups that believe promises of post-electoral transfers are sufficiently responsive electorally that politicians have an incentive to target all of them with these promises. As credibility falls further, some of these groups no longer believe promised transfers and politicians do not provide them. However, at high levels of credibility, there are some groups that believe promises of post-electoral transfers but are insufficiently responsive electorally to be targeted with them. When credibility falls from this higher level, it becomes more attractive to use both vote buying and promises of post-electoral transfers to attract additional group support. The critical credibility level is given by the condition that for group $m = n$ the parties' marginal benefit of making positive transfer promises equals the marginal tax cost.[8]

Propositions 2 and 3 provide a formal basis for the claim that the lack of political credibility of political competitors increases incentives to engage in vote buying. They also point to potential distributional consequences of vote buying. Kitschelt (2000), for example, argues that in weakly developed democracies, clientelist transactions – by which he means narrowly targeted transfers either before elections or after – may be the only vehicle for distributing government benefits to citizens. One implication of this type of argument is that some groups that would never receive post-electoral transfers are targeted with vote buying. Proposition 4 formally demonstrates that this is the case: the share of groups exclusively targeted with vote buying must increase when credibility is lower.

Proposition 4 (Targeted Groups) *If credibility n is low enough to satisfy the inequality $F'(0)\,\phi(n) \geq \frac{1}{N}\int_0^n \phi(m)\,dm$ then in an equilibrium where some groups targeted with vote buying are not made transfer promises, reduced credibility increases the share of those groups $m \in \left[m^f, m^k\right]$ targeted with vote buying and not with transfer promises.*

The logic of Proposition 4 is straightforward. Parties have a zero electoral return from

[8] This result echoes Keefer and Vlaicu's (2008) finding that politicians trade off transfers to groups that believe their promises against providing general public goods, whose electoral benefits decline with the fraction of groups that believe campaign promises. While the mechanism is related, here the identity of voters receiving these transfers (pre- or post-electoral) is different, as Proposition 4 makes clear.

making transfer promises to groups that do not believe party promises. A low level of credibility therefore imposes a binding upper bound on the share of groups that can be swayed with policy promises. This upper bound falls as credibility deteriorates, reducing the share of groups targeted with these promises. On the other hand, parties face no upper bound on the share of groups whose votes they can buy, other than that determined by the monetary cost of their vote buying activities. Moreover, as Proposition 3 showed, as credibility declines, more groups are targeted with vote buying. Hence, the lower is credibility, the greater the share of groups that cannot extract post-electoral transfers from the process of political competition, but are profitable for politicians to target with vote buying.

Propositions 2-4 suggest that, when political promises are not credible, vote buying may be the only vehicle through which some groups in society can extract targeted benefits from politicians. While consistent with the conjecture of Kitschelt (2000), this conclusion contrasts with arguments that vote buying is deleterious across the board as it erodes social norms or is synonymous with rent seeking. In our model vote buying is not caused by corruption, but rather both corruption and vote buying emerge when political promises are not credible; this point is further supported by the next proposition. Moreover, the groups that only receive vote buying transfers would be left worse off if vote buying were banned.

Another way to examine the electoral motivations that underlie vote buying is to ask more directly whether vote buying is sensitive to the pressures of electoral competition. In the context of probabilistic voting models one can adjust the pressures of electoral competition on parties by varying electoral shocks. Parties whose policies exhibit large amounts of rent seeking may still be elected due to favorable electoral shocks; parties that strive to deliver high levels of voter welfare may see their efforts come to naught due to large adverse electoral shocks. To the extent that the electoral environment exhibits low volatility - ψ is large - parties' announced policies matter more, and electoral shocks less, for their electoral success. Proposition 5 shows what happens to vote buying and rent seeking when electoral accountability tightens.

Proposition 5 (Electoral Competitiveness) *Increased electoral competition, i.e., higher* ψ, *reduces rent seeking* r^*_{t+1} *but increases vote buying* $k^*_t(m)$.

An increase in the pressures of electoral competition reduces political incentives to engage in rent seeking or political corruption. However, it also increases incentives to buy votes. This is key, because much of the literature conflates vote buying and corruption; as the pressures of electoral competition increase, though, holding political credibility constant, the two move in opposite directions. With more intense electoral competition the electoral

cost of rent seeking is higher, so rent seeking decreases; but the electoral benefit of vote buying is also higher, causing vote buying to increase.[9]

These propositions use the assumption that the most persuadable groups, those with the highest density of voters around the unbiased median, believe political promises. We could instead follow Keefer and Vlaicu (2008) and model credibility n as the endogenous outcome of political decisions to build credibility with particular groups. Here we do not consider the effects on vote buying of endogenizing credibility, but conjecture that the less efficient is vote buying and the more efficient are investments in credibility, the more likely that vote buying disappears in the long run, in a model that endogenizes credibility. The conclusions in Proposition 4 would therefore hold in the long run as long as it is sufficiently costly for politicians to invest in credibility.

Alternative assumptions about the distribution of partisan preferences across "persuaded" and "non-persuaded" voter groups create a more complicated set of tradeoffs, but do not affect the basic conclusions of Propositions 2-5. This is straightforward to see with the opposite assumption, that the least persuadable groups $m \in [n, N]$ believe political promises, rather than the most persuadable $m \in [0, n]$. Politicians can make credible policy commitments to the less persuadable groups, but because larger commitments are needed to mobilize these groups, the political payoff to such promises is lower. The effect of this alternative assumption is to reduce the opportunity costs of vote buying, so vote buying would increase.

5 Incumbency Advantage and Dynamic Effects

A simplifying assumption of the standard probabilistic voting setting above is that parties are symmetric. That feature captures open-seat elections reasonably well. However, elections frequently match an incumbent party against a challenger. The incumbent may have electoral advantages over the challenger, yielding an asymmetry between the two parties. This is especially salient in the case of vote buying since incumbents are often able to use public resources for electioneering to supplement their own private sources of financing.

If incumbency affords a vote buying advantage, what implications does this have for electoral strategies? Would the incumbent party be better off prioritizing vote buying over campaign promises? Would the challenger party have electoral incentives to boost

[9] The model's maintained assumption is that ego rents E do not increase with the intensity of electoral competition. If they did increase, increased electoral competition would further discourage rent seeking, and encourage vote buying, since the electoral cost of greater rent seeking, and the electoral benefit of vote buying, rise with ego rents.

its spending promises to compensate for its vote buying disadvantage, or, on the contrary, to moderate them? Here we present an extension of our baseline model to explore this incumbent-challenger asymmetry.

Consider, first, a one-election version of an incumbency model; later we analyze a dynamic extension. The timing is the same as in the one-election symmetric setting above. The voter side of the model is also the same as in the symmetric setting. On the party side of the model, two parties $j = IN, CH$, incumbent and challenger, have objective functions:

$$U_t^j = \beta \mathbb{P}\left\{win_t^j\right\}\left[E + R\left(r_{t+1}^j\right)\right] \tag{8}$$

This says that if the party wins, it receives an ego rent E and policy rents r_{t+1}^j from being in office in the next period. The winning probability depends on a party's vote buying and campaign promises; see equation (6). These are funded from the post-election budget, provided the party wins. We assume a financing asymmetry between the incumbent and the challenger, namely that the incumbent, being in office, can fund its pre-election vote buying by borrowing at t against period $t+1$ budgetary resources; these funds are repaid only in the event the incumbent wins reelection. The parties' budget constraints are therefore:

$$N\tau_{t+1}^j \geq \int_0^N \left[k_t^j(m) + f_{t+1}^j(m)\right] dm + g_{t+1}^j + r_{t+1}^j \tag{9}$$

for $j = IN, CH$, where τ_{t+1}^j are tax revenues and where we impose $k_t^{CH}(m) = 0$ for all $m \in [0, N]$, that is, the challenger cannot buy votes.[10]

Proposition 6 (Incumbency) *In a one-election setting where the party in office can use public funds to finance vote buying: i) The incumbent party has a higher winning probability than the challenger party; ii) Relative to a symmetric scenario (indicated by* ^{S}*) where both parties can use public funds for vote buying, the incumbent party makes more expensive campaign promises, due to its higher rents; in contrast, the challenger party makes less expensive campaign promises, due to its lower vote buying and lower rents:* $\tau_{t+1}^{IN} > \tau_{t+1}^S > \tau_{t+1}^{CH}$*; iii) Reduced credibility increases vote buying and rent seeking by the incumbent party.*

In symmetric probabilistic voting models, candidates have an equal, 50 percent, chance of winning. Proposition 6, however, demonstrates that the incumbent party can use its vote buying advantage to secure a higher winning probability, i.e., an incumbency advantage.

[10] This last assumption can be relaxed by requiring instead that the challenger finances vote buying from personal funds and characterizing an equilibrium where this budget constraint is binding.

Intuitively, by having an additional policy instrument, namely vote buying, the incumbent can always mimic the challenger's strategy and then do better by engaging in some vote buying. This provides it with a winning edge over the challenger. This incumbency advantage allows the incumbent to earn higher rents because its marginal return to rent seeking $\beta\mathbb{P}\left\{win_t^{IN}\right\}$ is larger than the challenger's, while the marginal cost of rents is the same, as winning probabilities $\mathbb{P}\left\{win_t^{j}\right\}$ are linear in rents. On the other hand, to remain competitive the challenger has to compensate for its electoral disadvantage by promising lower rents.

What are the implications of reduced credibility on the incumbent and challenger parties' electoral strategies? Proposition 6 says that when credibility falls the incumbent party will increase its vote buying and rent seeking. Reduced credibility lowers the electoral cost of vote buying, since fewer voter groups trust party strategies. This increases the incumbent's incentive to engage in vote buying. It also increases the electoral boost it receives from vote buying. At the same time, reduced credibility lowers the electoral cost of rent seeking for both the incumbent and the challenger. That has to result in higher incumbent rent seeking. If it did not, and only challenger rents increase, the incumbency advantage would be even greater, creating even stronger incumbent incentives for rent seeking. The incumbent could increase rent seeking by less than the challenger in order to increase its probability of reelection, or increase rent seeking by more and accept a lower probability of reelection (though not necessarily a lower expected value of rents).[11]

We further explore the implications of this model by considering a dynamic extension. Suppose that after winning an open-seat election the incumbent party can run in a second election for an additional term. If parties anticipate that by winning an open-seat symmetric election they will enjoy an incumbency advantage in subsequent elections, their behavior in the symmetric election may change compared to the static analysis above. Is vote buying going to intensify or weaken when parties envision a future incumbency advantage? How do campaign promises change? Answering these question requires a dynamic setting.

We model dynamics by considering two consecutive elections. The first election is symmetric; two identical office-seeking parties compete in an open-seat election and have campaign funds of equal size $D > 0$. The second election is asymmetric, as in the one-election incumbency model. The winner of the first election, i.e., the incumbent party, can engage in vote buying using public resources, while the losing party, the challenger, cannot buy votes,

[11] We can show, for example, that if $R(r) = \ln r$ then the incumbent's adjustment to lower credibility is through greater rent seeking, reducing somewhat its electoral success probability.

that is $k_{t+1}^{CH}(m) = 0$ for all $m \in [0, N]$.[12]

The objective function of party $j = A, B$ in the first election is then:

$$\begin{aligned} U_t^j &= \left[D - \int_0^N k_t^j(m)dm\right] + \beta \left\{\mathbb{P}\left\{win_t^j\right\}\left[E + R\left(r_{t+1}^j\right) + U_{t+1}^{IN}\right]\right. \\ &\quad \left. + \left[1 - \mathbb{P}\left\{win_t^j\right\}\right] U_{t+1}^{CH}\right\} \end{aligned} \tag{10}$$

where $U_{t+1}^j = \beta\mathbb{P}\left\{win_{t+1}^j\right\}\left[E + R\left(r_{t+2}^j\right)\right]$ for party $j = IN, CH$. The parties face the following budget constraints at $t+1$ and $t+2$:

$$N\tau_{t+1}^j \geq \int_0^N f_{t+1}^j(m)dm + g_{t+1}^j + r_{t+1}^j \text{ and } D \geq \int_0^N k_t^j(m)dm, \text{ for } j = A, B. \tag{11}$$

$$N\tau_{t+2}^j \geq \int_0^N \left[k_{t+1}^j(m) + f_{t+2}^j(m)\right]dm + g_{t+2}^j + r_{t+2}^j, \text{ for } j = IN, CH. \tag{12}$$

The timing is as follows. At time t parties simultaneously announce policy vectors $\mathbf{p}_t^A$ and $\mathbf{p}_t^B$ and carry out their vote-buying strategies; the first election takes place, voters pick their preferred party. At time $t+1$ the winning party implements the rest of the policy vector announced prior to the election; the winning party, i.e., the incumbent, and its challenger announce policy vectors $\mathbf{p}_{t+1}^{IN}$ and $\mathbf{p}_{t+1}^{CH}$ and the incumbent buys votes; the second election takes place, voters pick their preferred party. At time $t+2$ the party winning the second election implements the rest of the announced policy vector.[13]

We characterize a subgame perfect equilibrium of this model. That is, we look for party strategies that are mutual best responses in the full game as well as the second-period subgames. Note that a finitely-repeated version of the one-election model without an incumbent advantage is stationary: the one-election equilibrium is played in every election. In the presence of an incumbent advantage, however, a past victory affects a party's strategic position in a future election. The following result summarizes the implications.

Proposition 7 (Dynamics) *In a two-election setting where the first-election winner has*

[12] Again, the constraint on the challenger can be relaxed by assuming the challenger has a lower budget for vote buying and characterizing an equilibrium where this constraint is binding. In particular, we abstract from the case where the challenger has resources left over from the first election that it can spend on vote buying in the second, since these resources must, in any case, be less than those available to the incumbent.

[13] In an infinitely repeated game, it is conceivable that voters in the non-persuaded group could come to believe promises after observing that parties consistently deliver on them. However, Aldrich (1995) argues that voter ability to hold politicians accountable depends on whether politicians are collectively organized. Keefer (2014) notes that it also depends on whether voters are collectively organized to overcome free rider problems. Repeated interaction of politicians and voters may be insufficient to guarantee that these organizational arrangements will emerge.

a subsequent vote-buying advantage: i) First-election vote buying is higher and rent seeking is lower relative to a setting with no incumbent funding advantage; ii) Reduced credibility in the first election increases first-election vote buying and rent seeking; iii) Reduced credibility in both elections increases first-election vote buying, as long as the incumbency premium $U_{t+1}^{IN} - U_{t+1}^{CH}$ *increases when credibility* n *decreases.*

From Proposition 6 we know that the incumbent enjoys a higher winning probability, and can thus afford to extract higher rents. This implies $U_{t+1}^{IN} = \beta \mathbb{P}\left\{win_{t+1}^{IN}\right\}\left[E + R\left(r_{t+2}^{IN}\right)\right] > \beta \mathbb{P}\left\{win_{t+1}^{CH}\right\}\left[E + R\left(r_{t+2}^{CH}\right)\right] = U_{t+1}^{CH}$. Thus the first-election winner expects a positive incumbency premium $U_{t+1}^{IN} - U_{t+1}^{CH} > 0$. This raises the return to winning the first election, making it profitable for both candidates to intensify strategies that boost winning chances, such as increasing vote buying and reducing rent seeking.[14]

Reduced credibility in the open-seat election lowers the electoral cost of rent seeking in the first term in office, since there are more voter groups that ignore campaign promises. This increases the incentive to engage in additional rent seeking. Higher rents increase the return to winning the election, making it profitable to invest additional resources in vote buying in order to increase winning chances. Reduced credibility in both elections has an ambiguous effect on rent seeking because the electoral cost of rent seeking may go either up or down. On the one hand, fewer groups trust campaign promises, on the other, the cost of losing the support of those that do is now higher due to the higher incumbency premium. However, the higher incumbency premium raises the overall return to electoral success, namely $E + R\left(r_{t+1}^{j}\right) + \left(U_{t+1}^{IN} - U_{t+1}^{CH}\right)$, making it profitable for candidates to boost their electoral success by investing additional resources in vote buying.

6 Discussion and Conclusion

Although transfers targeted to individuals or narrow groups of voters are prototypical manifestations of clientelism (Kitschelt and Wilkinson, 2007), the timing of these transfers and the differences between transfers prior to and after the election have received relatively little attention. We develop a model of political competition that allows both pre- and post-electoral transfers to voters. We show that reduced party credibility increases vote buying both on the intensive and the extensive margin. We also demonstrate that where political

[14] Note that the logic here is similar to that of intensified political competition, i.e., higher ψ, from the one-election setting; see Proposition 5. Both electoral competition and the incumbency premium make winning probabilities more sensitive to party policies.

credibility is limited, some voters may only receive vote buying transfers. Moreover, while it has been argued that across countries vote buying is associated with corruption, we find that the pressures of electoral competition increase vote buying while attenuating rent seeking, suggesting that third factors like party credibility may be important for this correlation.

We confirm and extend these results in settings with incumbency and dynamic effects. In one, also a one-period electoral model, incumbents have an advantage in financing vote buying. Once again, we find that in low credibility settings, vote buying increases. In the other, we examine the effects of credibility on vote buying when there are two elections. In the first election candidates are equally able to finance vote buying, but both anticipate that the winner of the election will enjoy an incumbency advantage in financing vote buying in the second election. Again, under plausible conditions, vote buying rises with a decline in credibility.

These findings help to account for several stylized facts regarding vote buying. First, vote buying seems to be more pronounced in countries that lack programmatic parties. These parties facilitate credible commitments by politicians to voters. The analysis here makes explicit the link from credibility to vote buying. Moreover, vote buying is persistent and programmatic parties seem to be slow to develop in many democracies. Our analysis of political credibility points to a reason why this might be the case: while increased political credibility leaves more money in the pockets of voters, on average, since it reduces rent seeking by politicians, it also reduces transfers, both pre- and post-electoral; it need not be the case that all voters are better off when the credibility of political parties increases. The potential loss of support of these voter groups might act as a deterrent to political entrepreneurs seeking to convert clientelist parties into programmatic parties.

The second stylized fact is that vote buying is valued by recipients and recipients tend not to penalize politicians who buy votes. We show that party vote buying is sensitive to the electoral pressures that they confront and serves the same function as promises of post-electoral transfers. While the specific mechanics of vote buying may be opaque or objectionable, at the level of abstraction of the model here the only significant difference between vote buying and post-electoral transfers is their timing.

Third, however, countries in which vote buying is prevalent seem also to be places where citizens are particularly dissatisfied with government. To the extent that this perception is true, the analysis here provides an explanation for it: politicians resort to vote buying when they are particularly non-credible. However, in these settings they are also particularly likely to extract rents. Hence, while vote buying is not a cause of dissatisfaction (on the contrary,

it may represent the best efforts that politicians can make to assuage voter dissatisfaction), it tends to emerge in settings where dissatisfaction is high.

A politician preference for vote buying can emerge if vote buying technologies are well-developed, but also if the government bureaucracy is particularly under-developed. In the long run, not analyzed here, both are choice variables of politicians, raising questions for further research. If political competitors have a greater capacity to make pre-electoral transfers than governments have to make post-electoral transfers, they are likely to be uninterested in reforms that improve the efficacy of government.

Political parties are a natural vehicle that politicians might develop to support political credibility. The analysis here therefore reinforces the research agenda, already present in the literature, to link party development to the clientelist strategies of politicians. It also points to the merits of distinguishing types of clientelism in future research. The underlying conditions that yield vote buying, prior to the election, and transfers to targeted groups, after the election, are quite distinct. The analysis here shows that particularly low levels of credibility are needed to trigger vote buying. This is likely to be accompanied by particularly high levels of rent seeking. Hence, the political circumstances in which we observe vote buying as the predominant mode of transfers are likely to be significantly different than those in which we observe campaign promises of post-electoral transfers.

Technical Appendix

The first part of this appendix derives parties' vote shares and objective functions. The second part presents proofs of the formal results in the main text.

A1. Preliminaries

Party j's vote share in group m is the measure of voters that prefer party j's policy vector to its opponent, party $-j$'s, policy vector. It can be further decomposed according to voters' responsiveness to vote buying.

$$\begin{aligned}
\pi^j(m) &= \mu\left(\left\{i \in m | V_i\left(\mathbf{p}^j\right) > V_i\left(\mathbf{p}^{-j}\right)\right\}\right) && (13)\\
&= \mu\left(\left\{i \in \hat{m} | V_i\left(\mathbf{p}^j\right) > V_i\left(\mathbf{p}^{-j}\right)\right\}\right) + \mu\left(\left\{i \notin \hat{m} | V_i\left(\mathbf{p}^j\right) > V_i\left(\mathbf{p}^{-j}\right)\right\}\right) && (14)
\end{aligned}$$

For party A it takes the form:

$$\begin{aligned}
\pi^A(m) &= \mu\Big(\Big\{i \in \hat{m} | \sigma_i(m) < \left[W_t^A(m) - W_t^B(m)\right]\\
&\quad + \beta\left[W_{t+1}^A(m) - W_{t+1}^B(m)\right]\mathbf{1}_{m\in[0,n]} - \delta\Big\}\Big)\\
&\quad + \mu\Big(\Big\{i \notin \hat{m} | \sigma_i(m) < \beta\left[W_{t+1}^A(m) - W_{t+1}^B(m)\right]\mathbf{1}_{m\in[0,n]} - \delta\Big\}\Big) && (15)\\
&= \eta\Big\{\left[W_t^A(m) - W_t^B(m)\right] + \beta\left[W_{t+1}^A(m) - W_{t+1}^B(m)\right]\mathbf{1}_{m\in[0,n]}\\
&\quad - \delta - \left(-\frac{1}{2\phi(m)}\right)\Big\}\phi(m)\\
&\quad + (1-\eta)\left\{\beta\left[W_{t+1}^A(m) - W_{t+1}^B(m)\right]\mathbf{1}_{m\in[0,n]} - \delta - \left(-\frac{1}{2\phi(m)}\right)\right\}\phi(m) && (16)\\
&= \frac{1}{2} + \Big\{\eta\left[W_t^A(m) - W_t^B(m)\right]\\
&\quad + \beta\left[W_{t+1}^A(m) - W_{t+1}^B(m)\right]\mathbf{1}_{m\in[0,n]} - \delta\Big\}\phi(m) && (17)
\end{aligned}$$

and, by complementarity, $\pi^B(m) = 1 - \pi^A(m)$.

Party j's vote share across all groups $m \in [0, N]$ is the average across groups of within-group vote shares.

$$\pi^j(\mathbf{p}_t^A, \mathbf{p}_t^B) = \int_0^N \pi^j(m)\frac{1}{N}dm \qquad (18)$$

For party A it takes the form:

$$\pi^A(\mathbf{p}_t^A, \mathbf{p}_t^B) = \frac{1}{2} + \frac{1}{N}\left\{\eta \int_0^N \left[W_t^A(m) - W_t^B(m)\right]\phi(m)\,dm + \beta \int_0^n \left[W_{t+1}^A(m) - W_{t+1}^B(m)\right]\phi(m)\,dm - \delta \int_0^N \phi(m)\,dm\right\} \quad (19)$$

and, by complementarity, $\pi^B(\mathbf{p}_t^A, \mathbf{p}_t^B) = 1 - \pi^A(\mathbf{p}_t^A, \mathbf{p}_t^B)$.

Party j's winning probability is the probability its overall vote share exceeds a half:

$$\mathbb{P}\left\{win_t^j\right\} = \mathbb{P}\left\{\pi^j(\mathbf{p}_t^A, \mathbf{p}_t^B) > \frac{1}{2}\right\} \quad (20)$$

For party A it takes the form:

$$\mathbb{P}\left\{win_t^A\right\} = \mathbb{P}\left\{\delta < \frac{1}{\int_0^N \phi(m)\,dm}\left[\eta \int_0^N \left[W_t^A(m) - W_t^B(m)\right]\phi(m)\,dm + \beta \int_0^n \left[W_{t+1}^A(m) - W_{t+1}^B(m)\right]\phi(m)\,dm\right]\right\} \quad (21)$$

$$= \frac{1}{2} + \frac{\psi}{\int_0^N \phi(m)\,dm}\left[\eta \int_0^N \left[W_t^A(m) - W_t^B(m)\right]\phi(m)\,dm + \beta \int_0^n \left[W_{t+1}^A(m) - W_{t+1}^B(m)\right]\phi(m)\,dm\right] \quad (22)$$

and, by complementarity, $\mathbb{P}\left\{win_t^B\right\} = 1 - \mathbb{P}\left\{win_t^A\right\}$.

Finally, each party $j = A, B$ selects a policy vector

$$\mathbf{p}_t^j = \left(\left[k_t^j(m)\right]_{m\in[0,N]}, \tau_{t+1}^j, \left[f_{t+1}^j(m)\right]_{m\in[0,N]}, g_{t+1}^j, r_{t+1}^j\right) \quad (23)$$

under the budget constraint in equation (5) that implies:

$$\tau_{t+1}^j = \frac{1}{N}\int_0^N f_{t+1}^j(m)dm + \frac{1}{N}g_{t+1}^j + \frac{1}{N}r_{t+1}^j \quad (24)$$

for $j = A, B$, to maximize its expected net rent benefits; see equation (4):

$$\max_{\mathbf{p}_t^j} \left[D - \int_0^N k_t^j(m) dm \right] + \beta \left\{ \frac{1}{2} + \frac{\psi}{\int_0^N \phi(m)\, dm} \left[\eta \int_0^N \left[K\left[k_t^j(m)\right] - W_t^{-j}(m) \right] \phi(m)\, dm \right. \right.$$
$$\left. \left. + \beta \int_0^n \left[1 - \tau_{t+1}^j + F\left[f_{t+1}^j(m)\right] + G\left(g_{t+1}^j\right) - W_{t+1}^{-j}(m) \right] \phi(m)\, dm \right] \right\} \left[E + R\left(r_{t+1}^j\right) \right] \quad (25)$$

A2. Mathematical Proofs

Proof of Proposition 1. In an interior equilibrium parties adopt symmetric strategies. The equilibrium levels of the different components of a party's policy vector satisfy the following first-order conditions, for $j = A, B$. The variable at the beginning of each line indicates what the optimization is done with respect to.

$$k_t^j(m) \;:\; -1 + \left[E + R\left(r_{t+1}^j\right)\right] \frac{\beta\psi\eta}{\int_0^N \phi(m)\, dm} K'\left[k_t^j(m)\right] \phi(m) = 0 \quad (26)$$

$$f_{t+1}^j(m) \;:\; \left[E + R\left(r_{t+1}^j\right)\right] \frac{\psi\beta}{\int_0^N \phi(m)\, dm} \left\{ \int_0^n \left(-\frac{1}{N}\right) \phi(m)\, dm + F'\left[f_{t+1}^j(m)\right] \phi(m) \right\} = 0$$
$$\text{if } m \in [0, n] \quad (27)$$

$$g_{t+1}^j \;:\; \left[E + R\left(r_{t+1}^j\right)\right] \frac{\psi\beta}{\int_0^N \phi(m)\, dm} \int_0^n \phi(m)\, dm \left[-\frac{1}{N} + G'\left(g_{t+1}^j\right) \right] = 0 \quad (28)$$

$$r_{t+1}^j \;:\; \frac{R'\left(r_{t+1}^j\right)}{2} - \left[E + R\left(r_{t+1}^j\right)\right] \frac{\psi\beta \int_0^n \phi(m)\, dm}{N \int_0^N \phi(m)\, dm} = 0 \quad (29)$$

where in the last equation we use $\mathbb{P}\left\{win_t^A\right\} = \mathbb{P}\left\{win_t^B\right\} = \frac{1}{2}$. ■

Proof of Proposition 2. Equilibrium vote buying and transfer promises for group m, namely $k_t^*(m)$ and $f_{t+1}^*(m)$, satisfy equations (26), (27), and (29), respectively. From the first equation, and using the monotonicity and strict concavity of R and K, it follows that vote buying and rent seeking cannot change in opposite directions as n decreases. For example, if rent seeking r_{t+1}^j increases, rent benefits $E + R\left(r_{t+1}^*\right)$ increase, and so $K'\left[k_t^*(m)\right]$ has to decrease; but that implies that $k_t^*(m)$ increases as well. Also, rent seeking r_{t+1}^j cannot decline when credibility n decreases, since by equation (29) the first term would increase, by the strict concavity of R, while the second term decreases, as R is strictly increasing

in r_{t+1}^{j}. Thus, vote buying and rent seeking both increase. Also, from equation (27), since $F'\left[f_{t+1}^{*}(m)\right]\phi(m) = \frac{1}{N}\int_0^n \phi(m)\,dm$, as n decreases, $F'\left[f_{t+1}^{*}(m)\right]$ has to decrease, implying by the strict concavity of F that $f_{t+1}^{*}(m)$ increases. ■

Proof of Proposition 3. From Proposition 1 we know that for each m vote buying $k_t^*(m)$ increases when credibility n decreases. Also, from equation (26), $k_t^*(m)$ is decreasing in m because $\phi(m)$ is decreasing in m. Define $m^k \equiv \inf\{m \in [0,N] \,|k_t^*(m) > 0\}$ as the least persuadable group that receives positive vote buying transfers. As m decreases, $k_t^*(m)$ increases, and so m^k also increases, and consequently the share of groups targeted with vote buying, $\frac{m^k}{N}$. From equation (27), $f_{t+1}^{*}(m)$ is decreasing in m because $\phi(m)$ is decreasing in m. Define $m^f \equiv \inf\left\{m \in [0,N] \,|f_{t+1}^{*}(m) > 0\right\}$ as the least persuadable group that receives positive transfer promises. If $F'(0)\phi(n) < \frac{1}{N}\int_0^n \phi(m)\,dm$ then for group $m = n$ the marginal benefit of making positive transfer promises is lower than the marginal cost, implying that $f_{t+1}^{*}(m) = 0$ for all $m \geq n$. Thus, $m^f < n$. From Proposition 1 we know that for each m transfer promises $f_{t+1}^{*}(m)$ increase when credibility n decreases. Thus, m^f increases and with it the share of groups promised transfers, $\frac{m^f}{N}$. On the other hand if $F'(0)\phi(n) \geq \frac{1}{N}\int_0^n \phi(m)\,dm$ then $f_{t+1}^{*}(m) > 0$ for all $m \in [0,n]$. Thus, $m^f = n$. In this case, as n decreases, m^f also goes down. ■

Proof of Proposition 4. In equilibrium only groups $m \in \left[0, m^k\right]$ are targeted with vote buying, and only groups $m \in \left[0, m^f\right]$ are targeted with transfer promises. From Proposition 2, if $F'(0)\phi(n) \geq \frac{1}{N}\int_0^n \phi(m)\,dm$ then $m^f = n$. If, in addition, $m^f < m^k$ then groups $m \in \left[n, m^k\right]$ are targeted only with vote buying, and not with transfer promises. As n decreases, by Proposition 2, m^k increases, and so the measure of the groups exclusively targeted with vote buying, namely $\mu\left(\left[n, m^k\right]\right)$, goes up. ■

Proof of Proposition 5. The comparative statics with respect to electoral competition ψ follow from equations (26) and (29). They imply, by taking the ratio of their left-hand and right-hand sides, that

$$\frac{2}{N}\int_0^n \phi(m)\,dm = \eta\phi(m)\,K'\left[k_t^*(m)\right]R'\left(r_{t+1}^{*}\right) \tag{30}$$

which, using the concavity of both K and R, shows that $k_t^*(m)$, and r_{t+1}^{*} change in opposite directions when ψ changes, since the left-hand side does not vary with ψ. Then, from equation (26) it is apparent that as ψ increases r_{t+1}^{*} has to decrease and $k_t^*(m)$ has to

increase, otherwise the left-hand side of the first-order condition becomes strictly positive. Transfer and public good promises are not affected, because for each of these variables the electoral cost and electoral benefit change proportionately; see equations (27) and (28). ■

Proof of Proposition 6. (i) In equilibrium, the parties solve the following optimization problem:

$$\max_{\mathbf{p}_t^j} \beta \left[E + R\left(r_{t+1}^j\right)\right] \left\{ \frac{1}{2} + \frac{\psi}{\int_0^N \phi(m)\, dm} \left[\eta \int_0^N \left[K\left[k_t^j(m)\right] - W_t^{-j}(m)\right] \phi(m)\, dm \right.\right.$$
$$\left.\left. + \beta \int_0^n \left[1 - \tau_{t+1}^j + F\left[f_{t+1}^j(m)\right] + G\left(g_{t+1}^j\right) - W_{t+1}^{-j}(m)\right] \phi(m)\, dm \right] \right\} \tag{31}$$

where $\tau_{t+1}^j = \frac{1}{N} \int_0^N \left[k_t^j(m) + f_{t+1}^j(m)\right] dm + \frac{1}{N} g_{t+1}^j + \frac{1}{N} r_{t+1}^j$. The first-order conditions for an interior equilibrium are:

$$k_t^{IN}(m) \quad : \quad \left[E + R\left(r_{t+1}^{IN}\right)\right] \frac{\psi}{\int_0^N \phi(m)\, dm} \left[\eta K'\left[k^{IN}(m)\right] \phi(m) - \frac{\beta}{N} \int_0^n \phi(m)\, dm \right] = 0 \tag{32}$$

$$f_{t+1}^j(m) \quad : \quad \left[E + R\left(r_{t+1}^j\right)\right] \frac{\psi\beta}{\int_0^N \phi(m)\, dm} \left\{ \int_0^n \left(-\frac{1}{N}\right) \phi(m)\, dm + F'\left[f_{t+1}^j(m)\right] \phi(m) \right\} = 0$$
$$\text{if } m \in [0, n] \tag{33}$$

$$g_{t+1}^j \quad : \quad \left[E + R\left(r_{t+1}^j\right)\right] \frac{\psi\beta}{\int_0^N \phi(m)\, dm} \int_0^n \phi(m)\, dm \left[-\frac{1}{N} + G'\left(g_{t+1}^j\right) \right] = 0 \tag{34}$$

$$r_{t+1}^j \quad : \quad R'\left(r_{t+1}^j\right) \mathbb{P}\left\{win_t^j\right\} - \left[E + R\left(r_{t+1}^j\right)\right] \frac{\psi\beta \int_0^n \phi(m)\, dm}{N \int_0^N \phi(m)\, dm} = 0 \tag{35}$$

for party $j = IN, CH$. Suppose $\mathbb{P}\left\{win_t^{IN}\right\} < \mathbb{P}\left\{win_t^{CH}\right\}$. Then, from equation (35) rents are higher for the challenger, $r_{t+1}^{IN} < r_{t+1}^{CH}$ since $\frac{\mathbb{P}\left\{win_t^{IN}\right\}}{\mathbb{P}\left\{win_t^{CH}\right\}} = \frac{E+R\left(r_{t+1}^{IN}\right)}{R'\left(r_{t+1}^{IN}\right)} / \frac{E+R\left(r_{t+1}^{CH}\right)}{R'\left(r_{t+1}^{CH}\right)}$ and $\frac{E+R\left(r_{t+1}^j\right)}{R'\left(r_{t+1}^j\right)}$ is strictly increasing in r_{t+1}^j. Thus, the incumbent has a lower overall payoff, $\left[E + R\left(r_{t+1}^{IN}\right)\right] \mathbb{P}\left\{win_t^{IN}\right\} < \left[E + R\left(r_{t+1}^{CH}\right)\right] \mathbb{P}\left\{win_t^{CH}\right\}$. This, however, cannot be an equilibrium, since the incumbent having an additional policy instrument, $k_t^{IN}(m)$, can always match the challenger's strategy, and thus increase its overall payoff to $\left[E + R\left(r_{t+1}^{CH}\right)\right] \frac{1}{2} >$

$\left[E + R\left(r_{t+1}^{IN}\right)\right] \mathbb{P}\left\{win_t^{IN}\right\}$. Therefore, the incumbent's winning probability has to be at least as large as the challenger's. We now check if winning probabilities can be the same between the incumbent and challenger. Since $\mathbb{P}\left\{win_t^{IN}\right\} = \mathbb{P}\left\{win_t^{CH}\right\}$ implies from equation (35) that $r_{t+1}^{IN} = r_{t+1}^{CH}$, and from (33)-(34) $f_{t+1}^{IN}(m) = f_{t+1}^{CH}(m)$ and $g_{t+1}^{IN} = g_{t+1}^{CH}$, equal winning probabilities require the incumbent gets a zero electoral boost from vote buying, defined as the votes gained by increased vote buying less the votes lost from the taxes needed to pay for it:

$$\eta \int_0^N K\left[k_t^{IN}(m)\right] \phi(m)\, dm - \beta \int_0^n \left[\frac{1}{N} \int_0^N k_t^{IN}(m) dm\right] \phi(m)\, dm = 0 \tag{36}$$

Denote the incumbent's electoral boost from vote buying in group m by

$$\omega(m) \equiv \eta K\left[k_t(m)\right] \phi(m) - \frac{\beta}{N} k_t(m) \int_0^n \phi(m)\, dm \tag{37}$$

Notice that $\omega(m) = 0$ at $k_t(m) = 0$, because $K(0) = 0$. Thus, in equilibrium, $\omega(m) \geq 0$. In an interior equilibrium, $k_t^{IN}(m) > 0$ for some m. Suppose $\omega(m) = 0$ at the equilibrium level $k_t^{IN}(m) > 0$. Because $\omega(m) = 0$ at $k_t(m) = 0$, and K thus $\omega(m)$ are strictly concave, there must exist a $\hat{k}_t(m) \in \left(0, k_t^{IN}(m)\right)$ where $\omega(m) > 0$. Thus, $k_t^{IN}(m)$ cannot be optimal. It follows that if $k_t^{IN}(m) > 0$ then $\omega(m) > 0$. Integrating $\omega(m)$ over $m \in [0, N]$, it follows that at an equilibrium the electoral benefit of vote buying strictly exceeds the electoral cost of vote buying, in contradiction to equation (36). We conclude that $\mathbb{P}\left\{win_t^{IN}\right\} > \mathbb{P}\left\{win_t^{CH}\right\}$. (ii) Denote equilibrium outcomes in the counterpart symmetric setting by $\mathbf{p}_t^S$. If parties are symmetric, with both having access to public funds, then $k^S(m) = k^{IN}(m) > 0 = k^{CH}(m)$, since the incumbent confronts the same equilibrium vote buying condition as the parties in the symmetric equilibrium. Also, $\mathbb{P}\left\{win_t^S\right\} = \frac{1}{2}$ in equation (35). But because $\mathbb{P}\left\{win_t^{IN}\right\} > \mathbb{P}\left\{win_t^{CH}\right\}$ this equilibrium condition implies $r_{t+1}^{IN} > r_{t+1}^S > r_{t+1}^{CH}$. Since $f_{t+1}^{IN}(m) = f_{t+1}^{CH}(m) = f_{t+1}^S(m)$ and $g_{t+1}^{IN} = g_{t+1}^{CH} = g_{t+1}^S$, it follows that $\tau_{t+1}^{IN} > \tau_{t+1}^S > \tau_{t+1}^{CH}$. (iii) We first note that by equation (32) it follows that $k^{IN}(m)$ goes up when credibility n goes down, by the strict concavity of K. Moreover, the incumbent's electoral boost from vote buying $\eta K\left[k_t^{IN}(m)\right] \phi(m) - \frac{\beta}{N} k_t^{IN}(m) \int_0^n \phi(m)\, dm$ goes up when n goes down. To see this, note that its partial derivative with respect to n is $\left[\eta K'\left[k^{IN}(m)\right] \phi(m) - \frac{\beta}{N} \int_0^n \phi(m)\, dm\right] \frac{\partial k^{IN}(m)}{\partial n} - \frac{\beta}{N} \phi(n)\, k_t^{IN}(m) = -\frac{\beta}{N} \phi(n)\, k_t^{IN}(m) < 0$ iff $k_t^{IN}(m) > 0$, using the equilibrium condition in equation (32). Transfer and public good

promises are provided in the same amounts by the incumbent and challenger, by equations (33) and (34), so they do not advantage either electorally. Finally, to show that r_{t+1}^{IN} goes up when n goes down we note that either r_{t+1}^{IN} or r_{t+1}^{CH} have to go up when credibility n decreases. This follows from equation (35). Suppose they both go down. Then when credibility n decreases the marginal return to rent seeking $R'\left(r_{t+1}^{j}\right)\mathbb{P}\left\{win_{t}^{j}\right\}$ has to go down for both $j=IN,CH$. Since R is strictly concave, $R'\left(r_{t+1}^{j}\right)$ has to go up for both $j=IN,CH$, which implies $\mathbb{P}\left\{win_{t}^{j}\right\}$ has to go down for both $j=IN,CH$, a contradiction since $\mathbb{P}\left\{win_{t}^{IN}\right\}+\mathbb{P}\left\{win_{t}^{CH}\right\}=1$ for all n. Thus, either r_{t+1}^{IN} or r_{t+1}^{CH} have to go up when n goes down. Suppose that r_{t+1}^{CH} goes up but r_{t+1}^{IN} does not. Since the incumbent is relatively more disciplined in rent seeking, his transfer and public good promises are the same as the challenger's, and since his electoral boost from the additional vote buying increases, as shown above, his winning probability $\mathbb{P}\left\{win_{t}^{IN}\right\}$ has to go up. But that contradicts the equilibrium condition (35), since $R'\left(r_{t+1}^{IN}\right)\mathbb{P}\left\{win_{t}^{IN}\right\}$ goes up, but $\left[E+R\left(r_{t+1}^{IN}\right)\right]\psi\beta\int_{0}^{n}\phi\left(m\right)dm/N\int_{0}^{N}\phi\left(m\right)dm$ goes down. We conclude that r_{t+1}^{IN} has to go up. ■

Proof of Proposition 7. (i) Note that by subgame perfection in the second election the incumbent, as winner of the first election, and the challenger, as loser in the first election, behave as in the one-election version of the incumbency model, according to Propostion 6. From that setting we know that $\mathbb{P}\left\{win_{t+1}^{IN}\right\}>\frac{1}{2}>\mathbb{P}\left\{win_{t+1}^{CH}\right\}$ and $r_{t+2}^{IN}>r_{t+1}^{S}>r_{t+2}^{CH}$. Therefore, $U_{t+1}^{IN}=\beta\mathbb{P}\left\{win_{t+1}^{IN}\right\}\left[E+R\left(r_{t+2}^{IN}\right)\right]>U_{t}^{S}>U_{t+1}^{CH}=\beta\mathbb{P}\left\{win_{t+1}^{CH}\right\}\left[E+R\left(r_{t+2}^{CH}\right)\right]$, where $U_{t}^{S}=\beta\frac{1}{2}\left[E+R\left(r_{t+1}^{S}\right)\right]$ is a candidate's equilibrium continuation payoff in the one-election symmetric counterpart of Proposition 6's setting. It follows that the incumbency premium is positive, $U_{t+1}^{IN}-U_{t+1}^{CH}>0$. In the first election, each party $j=A,B$ solves:

$$\max_{\mathbf{p}_{t}^{j}}\left[D-\int_{0}^{N}k_{t}^{j}(m)dm\right]+\beta\left\{\mathbb{P}\left\{win_{t}^{j}\right\}\left[E+R\left(r_{t+1}^{j}\right)+\left(U_{t+1}^{IN}-U_{t+1}^{CH}\right)\right]+U_{t+1}^{CH}\right\} \tag{38}$$

taking as given the other party's strategy and the second-election equilibrium strategies, by subgame perfection. The first-order conditions are:

$$k_{t}^{j}(m):\left[E+R\left(r_{t+1}^{j}\right)+\left(U_{t+1}^{IN}-U_{t+1}^{CH}\right)\right]\frac{\beta\psi\eta\phi\left(m\right)}{\int_{0}^{N}\phi\left(m\right)dm}K'\left[k_{t}^{j}(m)\right]=1 \tag{39}$$

$$k_t^j(m) \;:\; \left[E + R\left(r_{t+1}^j\right) + \left(U_{t+1}^{IN} - U_{t+1}^{CH}\right)\right] \frac{\beta\psi\eta\phi\left(m\right)}{\int_0^N \phi\left(m\right) dm} K'\left[k_t^j(m)\right] = 1$$

$$f_{t+1}^j(m) \;:\; \frac{\psi\beta}{\int_0^N \phi\left(m\right) dm}\left\{F'\left[f_{t+1}^j(m)\right]\phi\left(m\right) - \frac{1}{N}\int_0^n \phi\left(m\right) dm\right\} = 0, \text{ if } m \in [0,n] \quad (40)$$

$$g_{t+1}^j \;:\; \frac{\psi\beta}{\int_0^N \phi\left(m\right) dm}\int_0^n \phi\left(m\right) dm\left[G'\left(g_{t+1}^j\right) - \frac{1}{N}\right] = 0 \quad (41)$$

$$r_{t+1}^j \;:\; \left[E + R\left(r_{t+1}^j\right) + \left(U_{t+1}^{IN} - U_{t+1}^{CH}\right)\right] \frac{\psi\beta\int_0^n \phi\left(m\right) dm}{N\int_0^N \phi\left(m\right) dm} = \frac{R'\left(r_{t+1}^j\right)}{2} \quad (42)$$

for $j = A, B$. We first characterize rent seeking. Note that when $U_{t+1}^{IN} - U_{t+1}^{CH} = 0$ in equation (42), the first-order condition is identical to equation (29) of Proposition 1. When $U_{t+1}^{IN} - U_{t+1}^{CH} > 0$ rent seeking must fall relative to rent seeking in the symmetric case of Proposition 1, $r_{t+1}^{**} < r_{t+1}^{*}$; otherwise the left side exceeds the right side. This further implies that $R'\left(r_{t+1}^{**}\right) > R'\left(r_{t+1}^{*}\right)$, and then by equation (42), we have $E + R\left(r_{t+1}^{**}\right) + \left(U_{t+1}^{IN} - U_{t+1}^{CH}\right) > E + R\left(r_{t+1}^{*}\right)$. Then, from equation (39), $K'\left[k_t^{**}(m)\right] < K'\left[k_t^{*}(m)\right]$, and since K is strictly concave, $k_t^{**}(m) > k_t^{*}(m)$. (ii) If credibility n goes down in the first election, from equation (42) r_{t+1}^{**} has to go up; otherwise, the left-hand side is strictly smaller than the right-hand side. Then from equation (39) it follows that $K'\left[k_t^{**}(m)\right]$ has to go down, which by the strict concavity of K means that $k_t^{**}(m)$ has to go up. (iii) If credibility n goes down in both elections, and $U_{t+1}^{IN} - U_{t+1}^{CH}$ increases, then from equation (42) it follows that $E + R\left(r_{t+1}^{**}\right) + \left(U_{t+1}^{IN} - U_{t+1}^{CH}\right)$ goes up; otherwise $R\left(r_{t+1}^{**}\right)$ and $R'\left(r_{t+1}^{**}\right)$ go down, a contradiction. Then from equation (39) $K'\left[k_t^{**}(m)\right]$ has to go down, which by the strict concavity of K means that $k_t^{**}(m)$ has to increase. ■

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