Varieties of Clientelism:
Machine Politics During Elections *

Jordan Gans-Morse†
Sebastian Mazzuca‡
Simeon Nichter§

August 18, 2012

*Authors listed in alphabetical order. The authors thank the following people: David Collier, Ernesto Dal Bo, Scott Gehlbach, Peter Lorentzen, Al Montero, Robert Powell, Jim Robinson, Michael Tomz, and Rodrigo Zarazaga.
†Northwestern University
‡Harvard University
§University of California, San Diego
Abstract

Although many studies of clientelism focus exclusively on vote buying, political machines often employ diverse portfolios of strategies. We provide a theoretical framework and formal model to explain how and why machines mix four clientelist strategies during elections: vote buying, turnout buying, abstention buying, and double persuasion. Machines tailor their portfolios to the political preferences and voting costs of the electorate. They also adapt their mix to at least five contextual factors: compulsory voting, ballot secrecy, political salience, machine support, and political polarization. Our analysis yields numerous insights, such as why the introduction of compulsory voting may increase vote buying, and why enhanced ballot secrecy may increase turnout buying and abstention buying. Evidence from various countries is consistent with our predictions, and suggests the need for empirical studies to pay closer attention to the ways in which machines combine clientelist strategies.
Introduction

During elections in many countries, clientelist parties (or political machines) distribute benefits to citizens in direct exchange for political support. Such parties compete not only on the basis of policy platforms, but also with material inducements given to individuals. These inducements often include food, medicine, and other forms of sustenance. In contexts where citizens are highly dependent on such handouts, including countries where the state fails to provide a social safety net, this pattern of machine politics can have particularly important consequences for democratic accountability and responsiveness.

In the past, prominent scholars viewed clientelism as a pre-industrial political phenomenon that would wane as societies modernized. But the evolution of machine politics is often remarkably different than in the U.S., where powerful machines such as Tammany Hall in New York and the Dawson machine in Chicago lost considerable influence over time. In many advanced democracies, such as Greece, Italy and Spain, clientelist parties continue to attract substantial numbers of votes using direct material inducements (Piattoni 2001; Kitschelt & Wilkinson 2007). Clientelism is even more pronounced in many developing countries, where a growing body of evidence reveals the various ways in which parties engage in machine politics. In Brazil, the prevalence of inducements during campaigns motivated over one million citizens to sign a petition in 1999 for stricter legislation, leading to the recent prosecution of nearly 700 politicians (Movimento de Combate à Corrupção Eleitoral 2010).

The present study develops a theoretical framework and formal model to parse out varieties of clientelism. These analytical tasks yield three important contributions: (1) revealing why machines are usually most effective when they combine clientelist strategies; (2) unifying in a common framework how machines choose their particular mix of clientelism; and (3) identifying contextual factors that are most propitious for each clientelist strategy. More specifically, the paper adds rigor to ongoing debates by integrating the analysis of four clientelist strategies: vote buying, turnout buying, abstention buying, and double persuasion. We present a conceptual typology that distinguishes these strategies and then operationalize
its two dimensions — as political preferences and voting costs — to analyze formally how and why machines combine strategies.

As summarized in Table 1, our model predicts that machines adapt their clientelist portfolios to at least five characteristics of political environments: compulsory voting, ballot secrecy, political salience, machine support, and political polarization. For example, we argue that the introduction of compulsory voting increases vote buying, whereas enhanced ballot secrecy increases turnout buying and abstention buying. Existing evidence from various countries is consistent with such predictions, and highlights the need for empirical studies to collect further data that facilitate rigorous analyses of the ways in which machines combine clientelist strategies.

Table 1: Predicted Impact of Contextual Changes on Clientelist Strategies

<table>
<thead>
<tr>
<th>Contextual Change</th>
<th>Vote Buying</th>
<th>Turnout Buying</th>
<th>Abstention Buying</th>
<th>Double Persuasion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compulsory Voting Introduced</td>
<td>Increases</td>
<td>Decreases</td>
<td>Decreases</td>
<td>Decreases</td>
</tr>
<tr>
<td>Ballot Secrecy Introduced</td>
<td>Decreases</td>
<td>Increases</td>
<td>Increases</td>
<td>Decreases</td>
</tr>
<tr>
<td>Decreased Political Salience</td>
<td>Increases</td>
<td>Decreases</td>
<td>Decreases</td>
<td>Decreases</td>
</tr>
<tr>
<td>Increased Machine Support</td>
<td>No Change</td>
<td>Increases</td>
<td>Decreases</td>
<td>No Change</td>
</tr>
<tr>
<td>Increased Political Polarization</td>
<td>Decreases</td>
<td>Increases</td>
<td>Increases</td>
<td>Increases</td>
</tr>
</tbody>
</table>

Understanding how such factors influence the mix of clientelism is important in part because strategies may entail different normative implications. For example, vote buying may be seen as unambiguously pernicious for democracy, as the strategy interferes with free and fair elections, and undermines political equality by allowing those who have resources to buy the votes of the poor (Stokes 2005, 316; see also Schaffer & Schedler 2007). By contrast, Hasen (2000, 1357–58, 1370) contends that the normative implications of turnout buying are more ambiguous because it may increase equality of political participation by inducing the poor to vote. Such normative questions challenge scholars to deepen their understanding of how political machines choose amongst different strategies.
Our findings advance the existing literature on clientelism. Unlike many recent studies that focus exclusively on vote buying (e.g., Hicken 2002; Stokes 2005; Lehoucq 2007), we explain how and why machines are likely to employ diverse portfolios of strategies. Our analysis of how five contextual characteristics affect four clientelist strategies encompasses and significantly extends an important strand of earlier research that narrowly analyzed the effect of electoral institutions on the choice between two clientelist strategies (e.g., Cox & Kousser 1981; Heckelman 1998). For instance, an empirical article by Cox & Kousser (1981) suggests that the introduction of the secret ballot leads machines to rely more heavily on abstention buying than vote buying. The present study also shares some commonalities with insightful work by Estevez, Magaloni & Diaz-Cayeros (2007), who suggest that machines optimally allocate resources across a portfolio of both clientelist and programmatic benefits. In contrast to their work, our exclusive focus on clientelism enables us to analyze four clientelist strategies (as opposed to just one) and to examine how machines adapt their mix to contextual factors.

Our formal analysis advances existing models of clientelism. Previous models rely on a one-dimensional voter space, in which citizens are arrayed along a spectrum of political preferences as in the classic Downsian spatial model of political competition. We introduce a second dimension, such that citizen types are defined both by political preferences and voting costs. This innovation facilitates the integration of nonvoters into our analyses. As a result, the present study addresses a major limitation in almost all existing models of clientelism — they examine only one strategy. For example, Stokes (2005) provides a model of vote buying, and Nichter (2008) develops a model of turnout buying. By contrast, we analyze the tradeoffs that parties face when combining four strategies. A model by Morgan & Vardy (2008) also begins to tackle the key issue of how parties combine strategies, but focuses narrowly on the impact of introducing the secret ballot. The present paper offers a more exhaustive analysis of the range of strategies employed by machines and, through the model’s comparative statics, a fuller assessment of factors that influence variation of
clientelist strategies.¹

The findings of this study also contribute to the broader literature on distributive politics. Vigorous scholarly debate continues over how parties distribute targetable goods, such as infrastructure projects and particularistic benefits. Two seminal formal studies offer conflicting predictions: whereas Cox & McCubbins (1986) argue that parties distribute targetable goods to core supporters, Lindbeck & Weibull (1987) contend they target swing voters. A more recent conceptual paper by Gary Cox (2006) argues that these and other studies focus too narrowly on persuasion (changing voters’ preferences); when strategies such as mobilization (affecting whether citizens vote) are considered, the core-supporter hypothesis is substantially strengthened. The present study contributes to this literature by exploring the mechanisms by which clientelist parties combine strategies of persuasion and mobilization.

The present study does not claim to provide an exhaustive analysis of all varieties of clientelism. We restrict our analysis to electoral clientelism; that is, strategies that exclusively involve the distribution of benefits during electoral campaigns. We acknowledge that clientelism often involves a broader set of strategies than just elite payoffs to citizens before elections. For example, studies such as Scott (1969), Levitsky (2003), and Lawson (2009) discuss patterns of relational clientelism that involve ongoing relationships of mutual support and dependence.² Nevertheless, our explicit focus on electoral clientelism facilitates analysis of numerous strategies that remain poorly understood.

Our analysis investigates an unprecedented range of clientelist strategies and contextual factors, and extends to most — though not necessarily all — political environments. Following previous studies (e.g., Stokes 2005; Nichter 2008), we focus on contexts in which political machines do not directly compete to provide clientelist rewards to the same citizens. Stokes argues that such “dueling machines” are uncommon because only one party usually has the requisite social networks and resources to deliver rewards in a given community (2005: 324; 1Dunning & Stokes (2009), an unpublished paper on the topic, examines only two strategies. 2Whereas “electoral” clientelism delivers all benefits during electoral campaigns, “relational” clientelism provides ongoing benefits (Nichter 2010).
2009). Our findings pertain to countries in which several machines may operate, but where each machine controls distinct geographic territories. Our scope also includes countries such as those where Kitschelt (2011: 9) argues clientelism is a “unilateral, monopolistic affair concentrated in the hands of a single party.” Based on extensive cross-national survey data, Kitschelt provides numerous examples of such countries, including Japan, Malaysia, Russia, Senegal, South Africa, Thailand, and Turkey. Of course, in some contexts multiple machines may engage in direct competition over identical voters, complicating formal analyses. The Discussion section at the end of the paper returns to this issue, considering how the “dueling machines” scenario could be modeled.

**Strategies of Electoral Clientelism**

Political machines often engage in several distinct strategies of clientelism during campaigns. Figure 1 presents a conceptual typology of five clientelist strategies, which target different types of individuals and induce distinct actions (Nichter 2008: 20). This section discusses each strategy and provides a stylized example about how political machines combine strategies. Later, we operationalize the two dimensions of the typology in order to analyze formally the logic by which machines mix clientelist strategies.

---

**Figure 1: Strategies for Distributing Targetable Goods**

<table>
<thead>
<tr>
<th>Political Preference of Recipient vis-à-vis Party Offering Goods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inclined Not To Vote</td>
</tr>
<tr>
<td>Favors Party</td>
</tr>
<tr>
<td>Indifferent or Favors Opposition</td>
</tr>
<tr>
<td><strong>Recipient Inclined to Vote or Not Vote</strong></td>
</tr>
<tr>
<td><strong>Inclined to Vote</strong></td>
</tr>
<tr>
<td><strong>Double Persuasion</strong></td>
</tr>
<tr>
<td><strong>Turnout Buying</strong></td>
</tr>
<tr>
<td><strong>Vote Buying</strong></td>
</tr>
<tr>
<td><strong>Abstention Buying</strong></td>
</tr>
<tr>
<td><strong>Rewarding Loyalists</strong></td>
</tr>
</tbody>
</table>

*Source: Adapted from Nichter (2008).*
Vote buying rewards opposing (or indifferent) voters for switching their vote choices. Studies on vote buying suggest that machines engage in this strategy in many parts of the world.\textsuperscript{3} One recent survey in Nigeria found that 70 percent of respondents believe vote buying occurs “all of the time” or “most of the time” during elections, with nearly 40 percent reporting that a close friend or relative was offered benefits to vote for a particular candidate.\textsuperscript{4} Empirical research on electoral clientelism typically focuses exclusively on vote buying, even though in reality machines often employ diverse portfolios of strategies. In particular, surveys and interviews frequently investigate “vote buying” by simply asking whether respondents receive particularistic benefits during campaigns, but rarely consider whether these rewards actually constitute other strategies such as turnout buying and abstention buying. An unfortunate consequence of this overwhelming focus on vote buying is the limited availability of evidence about other strategies discussed below.

Turnout buying rewards unmobilized supporters for showing up at the polls. During the 2004 US election, five Democratic Party operatives in East St. Louis were convicted in federal court for offering cigarettes, beer, medicine, and $5 to $10 rewards to increase turnout of the poor (Nichter 2008). One party official pleaded guilty and testified that operatives offered individuals rewards “because if you didn’t give them anything, then they wouldn’t come out” (cf Nichter 2008, 19). In the case of Argentina, Nichter argues that although both strategies coexist, survey data in Stokes (2005) are more consistent with turnout buying than vote buying. Evidence of turnout buying has also been found in the case of Venezuela (Rosas & Hawkins 2008), as well as Argentina and Mexico (Dunning & Stokes 2009).

Abstention buying rewards indifferent or opposing individuals for not voting (Cox & Kousser 1981; Schaffer 2002; Cornelius 2004).\textsuperscript{5} This demobilizational strategy reduces the

\textsuperscript{3}To mention just a few examples, recent publications on vote buying focus on countries including Argentina (Stokes 2005), Benin and São Tome (Vicente & Wantchekon 2009), Japan (Nyblade & Reed 2008), Mexico (Diaz-Cayeros, Estevez & Magaloni forthcoming), and Thailand (Bowie 2008).


\textsuperscript{5} Abstention buying is often termed “negative vote buying” in the literature. However, “negative turnout buying” would be a more precise alternative term because the strategy influences turnout, not vote choices.
number of votes received by opposition candidates. For example, Cox & Kousser (1981) examine newspaper articles from 1870 to 1916 in New York state, and show that political operatives paid many rural voters to stay home on Election Day. Similarly, politicians use rewards to demobilize opposition voters when busing them away from electoral districts in the Philippines and buying their identification cards in Guyana (Schaffer 2002).

*Double persuasion* provides benefits to citizens in order to induce their electoral participation *and* influence their vote choices. The broader literature on clientelism suggests that many individuals have little in the way of ideological preferences or reasons to vote, other than material rewards offered by clientelist parties (e.g., Chubb 1982, 171). With double persuasion, machines distribute benefits to such nonvoters who do not inherently prefer the machine on ideological or programmatic grounds. Although studies typically ignore double persuasion, we find that machines are typically most effective when they devote some resources to this strategy.

*Rewarding loyalists* provides particularistic benefits to supporters who would vote for them anyway. By definition, such rewards do not influence vote choices or induce turnout during a contemporaneous election. Scholars typically understand such benefits as part of ongoing, long-term relationships between politicians and citizens (e.g., Auyero 2000; Kitschelt & Wilkinson 2007). In one explanation of rewarding loyalists, Diaz-Cayeros, Estevez & Magaloni (forthcoming, ch. 4) argue that parties offer selective benefits to core supporters during elections in order to “prevent the erosion of partisan loyalties” over time. Given that we focus on short-term electoral clientelism, such ongoing relationships are outside of the scope of our analysis, and we do not incorporate rewarding loyalists in the present paper.

**Combining Strategies**

When distributing benefits during campaigns, political machines frequently combine several of the strategies in Figure 1. To provide intuition and motivate formal analysis of how political machines combine strategies, we first present a stylized example.

Assume that a political machine has $100 to distribute to citizens during a campaign.
The machine seeks to maximize its electoral prospects by influencing vote choices and/or turnout. There are 12 citizens whom the machine can target using different strategies:

- **Vote Buying**: Veronica ($10), Victor ($40), Virginia ($50)
- **Turnout Buying**: Tomas ($10), Teresa ($20), Tonia ($35)
- **Abstention Buying**: Alejandro ($10), Ana ($30), Alberto ($35)
- **Double Persuasion**: Debora ($10), David ($25), Diego ($40)

Observe that different payments (in parentheses) are required to buy each citizen using the given strategy. Required payments vary because citizens differ with respect to two key attributes — political preferences and voting costs. For example, vote buying is costlier when a citizen strongly opposes the machine on ideological grounds. Likewise, turnout buying is costlier when a citizen faces high voting costs such as transportation or lost wages.

Given the different required payments, how does the machine allocate its budget? The first crucial consideration is that vote buying benefits the machine more than other strategies. Vote buying provides two net votes — it adds a vote to the machine’s tally, and subtracts one from the opposition. By contrast, turnout buying and double persuasion provide only one net vote because they target nonvoters. Abstention buying also provides just one net vote by subtracting one from the opposition. To allocate its budget efficiently, the machine should target citizens who offer the most net votes per dollar spent.

Using this metric, the machine should start by vote buying Veronica. For $10, it earns two net votes (i.e., $5 per net vote). To vote buy an additional citizen, the machine would need to pay Victor $40 ($20 per net vote). Thus, the machine would be better off turnout buying Tomas, abstention buying Alejandro, and double persuading Debora as each provides one net vote for $10. The machine now has $60 remaining, and considers costlier citizens. It should vote buy Victor for $40 and turnout buy Teresa for $20. Both options are equally cost-effective ($20 per net vote), and preferable to using the other strategies to target David ($25 per net vote) or Ana ($30 per net vote).

This stylized example provides several insights for further investigation: (1) machines
often find it advantageous to combine clientelist strategies; (2) their mix depends on citizens’
political preferences and voting costs; and (3) machines are willing to pay more for vote
buying relative to other strategies. Observe that the machine’s decision process is actually
more complicated, because all opposition voters (e.g., Veronica and Alejandro) are potential
targets for both vote buying and abstention buying. We now develop a model that builds on
intuition from this stylized example, and suggests how machines tailor their mix of clientelist
strategies to specific political environments.

Model

Setup

Consider two political parties, an incumbent machine party \( (M) \) and an opposition party
\( (O) \), and a continuum of citizens with unit mass. Each party offers a platform, \( x^M \) and
\( x^O \), respectively, on a one-dimensional ideological spectrum ranging from \( X \) to \( \bar{X} \). Without
loss of generality, let \( x^O < x^M \), and for simplicity, assume that the parties’ platforms are
symmetric around zero (that is, \( x^O = -x^M ) \).  

Both parties’ platforms are fixed for the duration of our analysis. This simplifying as-
sumption is consistent with our focus on electoral clientelism, and accurately reflects reality
during many electoral campaigns: parties may have attributes that cannot be credibly trans-
formed in the short run, such as the personal or ideological characteristics of their leaders.  

We operationalize the dimensions of the typology presented above by examining political
preferences and voting costs. Each citizen \( i \) is defined by her political preferences \( x_i \) and
net voting costs \( c_i \), where \( x_i \) and \( c_i \) are independent.  
The citizens’ ideal points \( x_i \) are
distributed over \([X, \bar{X}]\) according to \( F(x) \), where \( F \) has a strictly positive and continuously
differentiable density \( f \) over \((X, \bar{X})\). Net voting costs \( c_i \) are distributed over \([C, \bar{C}]\) according

---

6 This assumption simplifies the analysis but qualitatively does not affect our results.
7 Holding platforms constant is consistent with numerous influential models of redistributive politics and
clientelism (e.g., Lindbeck & Weibull 1987, Dixit & Londregan 1996, Stokes 2005, Nichter 2008; also see
8 This assumption suggests that net voting costs (voting costs minus abstention costs) are not inherently
less for machine supporters (or opposers). As we explore below, this assumption does not imply that strong
and weak partisans are equally willing to incur voting costs.
to $G(c)$, where $G$ has a strictly positive and continuously differentiable density $g$ over $(C, \overline{C})$. For ease of explication, we focus on the case where the parties’ platforms are the endpoints of the citizens’ ideological spectrum (i.e., $X = x^O$ and $\overline{X} = x^M$), but results are not affected if some citizens have more extreme political preferences (i.e., $X < x^O$ and $\overline{X} > x^M$).\(^9\)

We follow the broad range of studies that employ expressive utility as a way of overcoming the supposed “paradox” of voter turnout.\(^10\) Our model assumes that a citizen’s utility equals the difference between her expressive value from voting and her net voting costs. Formally, a citizen of type $(x_i, c_i)$ who votes for party $P \in \{M, O\}$ receives utility:\(^11\)

$$U^P(x_i, c_i) = -|x^P - x_i| - c_i$$ (1)

The first term, $-|x^P - x_i|$, captures the notion that the closer the citizen’s ideal point to the platform of the party for which she votes, the more utility she receives from casting a ballot. The second term, $c_i$, represents the citizen’s net voting cost. This cost includes material costs of reaching the polls (such as transportation, lost wages or child care) less any costs incurred from abstention. Such abstention costs range from social disapprobation to fines and penalties in countries with compulsory voting laws.\(^12\) If a citizen abstains, she is assumed to receive a reservation utility of 0.\(^13\)

We assume that a machine has a given budget $B$ to allocate across citizens using different strategies of electoral clientelism.\(^14\) In order to allocate this budget most effectively, the

\(^9\)A proof is available upon request.
\(^11\)While this utility function facilitates exposition and graphic illustration, all propositions below hold for a broad class of utility functions, including a quadratic loss function. Results are robust to any utility function that is continuous and of the form $U(x_i, c_i) = L(x^P; x_i) - h(c_i)$, where $L(x^P; x_i)$ is a concave loss function parameterized by the parties’ platforms $P \in \{M, P\}$ and $h(c_i)$ is monotonically increasing in $c_i$.
\(^12\)We make two realistic assumptions that ensure an interior solution to the machine’s optimization problem and monotonicity of comparative statics: (1) some indifferent citizens vote (formally, this requires $C < -x^M$); and (2) even with electoral clientelism, there exist strong supporters who do not vote (formally, this requires $C > b^*$, where $b^*$ is defined below as the most-expensive payment to nonvoters).
\(^13\)Note that disutility of abstaining, which may vary across individuals, is already captured by the use of net voting costs ($c_i$). An equivalent way of representing this setup is to unpack net voting costs such that $c_i = k_i - a_i$, where $k_i \geq 0$ represents an individual’s voting costs and $a_i \geq 0$ represents an individual’s abstention costs. The citizen turns out if $-|x^P - x_i| - k_i \geq -a_i$, or equivalently, if $-|x^P - x_i| - c_i \geq 0$. Thus, with the use of net voting costs, the reservation utility is 0.
\(^14\)The present paper examines how a machine optimally allocates a given budget $B$ across strategies of
machine’s objective is to maximize the net votes received from payments to citizens (i.e., additional votes for the machine plus votes taken away from the opposition). We assume the machine cannot afford to buy all citizens, given its limited resources ($B$).\footnote{Formally, the machine’s problem is to maximize its net votes by assigning a reward $b_i \geq 0$ to every citizen, such that total expenditures, $\int \int b_i g(c) f(x) dc dx$, are less than or equal to budget $B$. All results are identical if we instead set up the model as an expenditure minimization problem, in which the machine minimizes expenditures while buying a given number of citizens needed for victory.}

As discussed in the Introduction, we follow models of clientelism such as Stokes (2005) and Nichter (2008) by focusing on the many contexts in which either: (a) one party engages in clientelism, or (b) multiple machines operate but each controls distinct communities. Our decision-theoretic model thereby assumes that political machines do not directly compete to provide rewards to the same citizens. Later we discuss how a game-theoretic model could investigate what Stokes (2005: 324) describes as the empirically “unusual” case of “dueling machines.”\footnote{Stokes (2009, 12, 20) provides two reasons why researchers commonly assume a single machine: (1) the incumbent party has exclusive access to public coffers used for clientelist payments; and (2) only one party has invested in the “dense organizational structure” and “social proximity” that define a machine. As mentioned previously, Kitschelt’s (2011) extensive survey identifies numerous countries with only one machine. Furthermore, even in countries where multiple machines operate, often in a given town only one party has the infrastructure, social networks and resources required to deliver rewards and monitor behavior.} We assume that a machine can observe citizens’ political preferences and voting costs through its extensive social networks. We also initially assume that the machine is able to enforce clientelist exchanges, but later relax this assumption to examine how ballot secrecy affects the mix of strategies due to the threat of opportunistic defection by citizens.

**Classifying Citizens**

Given its knowledge of preferences and voting costs, the machine can classify citizens. If a citizen shows up at the polls, she will vote for the machine if doing so provides (weakly) greater utility than voting for the opposition. That is, a citizen votes for the machine if $U^M_i \geq U^O_i$, or equivalently, if $x_i \geq 0$.\footnote{To ensure that the party’s optimization problem is well-defined, we assume that citizens who are indifferent between the two parties vote for the machine and that citizens who are indifferent between abstaining and voting come to the polls.} Thus, citizens with political preferences $x_i \geq 0$ are supporters of the machine, while those with political preferences $x_i < 0$ are opposers. But a
citizen will only vote for her preferred party if doing so provides (weakly) greater utility than abstaining, which yields a reservation utility of 0. That is, she votes if \( \max [U^M_i, U^O_i] \geq 0 \), or equivalently, if \( \max [-|x^M - x_i| - c_i, -|x^O - x_i| - c_i] \geq 0 \). Overall, the machine can classify the population into four groups of citizens:

- **Supporting Voters**: Citizens with \( x_i \geq 0 \) and \( -|x^M - x_i| - c_i \geq 0 \)
- **Supporting Nonvoters**: Citizens with \( x_i \geq 0 \) and \( -|x^M - x_i| - c_i < 0 \)
- **Opposing Voters**: Citizens with \( x_i < 0 \) and \( -|x^O - x_i| - c_i \geq 0 \)
- **Opposing Nonvoters**: Citizens with \( x_i < 0 \) and \( -|x^O - x_i| - c_i < 0 \)

Figure 2 presents a graphical depiction of these four groups of citizens (from the perspective of the machine). Political preferences are represented on the horizontal axis, while net voting costs are represented on the vertical axis. The “turnout indifference vertex” represents citizens who are indifferent between voting and not voting, because they receive the same utility from voting as they do from abstaining.\(^{18}\) More specifically, all citizens on or below the right section of the vertex (\( l_1 \)) vote for the machine; those on or below the left section (\( l_2 \)) vote for the opposition. All citizens above the vertex are nonvoters.

\(^{18}\)Formally, these are supporters for whom \( -|x^M - x_i| - c_i = 0 \) and opponents for whom \( -|x^O - x_i| - c_i = 0 \). It thus follows that \( l_1 = x - x^M \) and \( l_2 = -x + x^O = -x - x^M \), where the second equation follows from the assumption of symmetric party platforms, \( x^M = -x^O \).
The shape of the turnout indifference vertex reflects the fact that citizens with intense political preferences (i.e., voters for whom \(x_i\) approaches either \(x^M\) or \(x^O\)) receive greater expressive utility from voting, as can be observed in the utility function (Equation 1). They are thus more inclined to incur voting costs and turn out to support their favored party. By contrast, citizens who have weak political preferences (i.e., citizens for whom \(x_i\) approaches 0) receive lower expressive utility from voting, and thus are less inclined to incur voting costs and show up at the polls.\(^{19}\)

**Payments**

In order to determine the machine’s optimal mix of clientelist strategies, we first identify how much the machine would need to pay to buy each citizen type. Intuitively, the reward it would need to pay varies, because citizens incur different ideological and voting costs when exchanging electoral support for clientelist rewards. For each strategy, the required payments (\(\bar{b}_i\)) are as follows:

*Vote Buying* targets opposing voters, who have a reservation utility of \(U^O_i\). To induce an opposing voter of type \(t_i = (x_i, c_i)\) to switch her vote, the machine must therefore pay \(\bar{b}_{i}^{VB}\) such that \(U^M_i + \bar{b}_{i}^{VB} \geq U^O_i\). In an optimal allocation, the machine sets payments equal to a citizen’s reservation value, because it will not “overpay” (pay a citizen more than her reservation value) or “underpay” (pay a citizen less than her reservation value).\(^{20}\) Thus, the inequality binds. Substituting the identities of \(U^M_i\) and \(U^O_i\) from Equation 1 yields:

\[
-|x^M - x_i| - c_i + \bar{b}_{i}^{VB} = -|x^O - x_i| - c_i.
\]

Then, solving for \(\bar{b}_{i}^{VB}:\)

\[
\bar{b}_{i}^{VB} = -2x_i.
\]

As shown in Equation 2, the machine can vote buy all opposing voters with a given ideal point for the same price, even if they have different costs of voting. Because they already show up at the polls, opposing voters only need to be compensated for voting against their

\(^{19}\)The horizontal axis in Figure 2 represents \(C\). Since \(c_i\) represents net voting costs, \(C\) can be less than 0 (i.e., abstention costs greater than voting costs). Given our assumption that some indifferent citizens vote, the vertex tip is above the horizontal axis.

\(^{20}\)A proof is available upon request.

\(^{21}\)For the derivation of equations in this section, recall the assumption of symmetric party platforms, \(x^M = -x^O\).
political preferences.

Turnout Buying targets supporting nonvoters, who have a reservation utility of 0. To induce turnout of a supporting nonvoter of type \( t_i = (x_i, c_i) \), the machine must pay \( \bar{b}_i^{TB} \) such that \( U_i^M + \bar{b}_i^{TB} \geq 0 \). Substituting the identity of \( U_i^M \) from Equation 1 yields: \(-|x^M - x_i| - c_i + \bar{b}_i^{TB} \geq 0\). Then, given that the inequality binds and solving for \( \bar{b}_i^{TB} \):
\[
\bar{b}_i^{TB} = c_i - x_i + x^M
\] (3)

Supporting nonvoters receive more utility from abstaining than from voting. Thus, with turnout buying, the machine must compensate such citizens for the difference between the utility received from staying home and the utility received from voting for the machine.

Abstention Buying targets opposing voters, who have a reservation utility of \( U^O \). In order to convince an opposing voter of type \( t_i = (x_i, c_i) \) to stay home, the machine must offer a reward \( \bar{b}_i^{AB} \) such that: \( \bar{b}_i^{AB} \geq U_i^O \). Substituting \( U_i^O \) from Equation 1 yields: \( \bar{b}_i^{AB} \geq -|x^O - x_i| - c_i \). Then, given that the inequality binds and solving for \( \bar{b}_i^{AB} \):
\[
\bar{b}_i^{AB} = -x_i - x^M - c_i
\] (4)

With abstention buying, the machine must compensate opposing voters for: (1) the forgone utility of voting for their preferred party; and (2) the cost they incur by abstaining.

Double Persuasion targets opposing nonvoters, who neither participate in elections nor support the machine. Their reservation utility is 0. To induce an opposing nonvoter of type \( t_i = (x_i, c_i) \) to turn out and vote for the machine, the party must therefore pay \( \bar{b}_i^{DP} \) such that \( U_i^M + \bar{b}_i^{DP} \geq 0 \). Substituting the identity of \( U_i^M \) from Equation 1 yields: \(-|x^M - x_i| - c_i + \bar{b}_i^{DP} \geq 0\). Then, given that the inequality binds and solving for \( \bar{b}_i^{DP} \):
\[
\bar{b}_i^{DP} = c_i - x_i + x^M
\] (5)

Observe that Equations 3 and 5 are identical, except that double persuasion targets opposing nonvoters \((x_i < 0)\), while turnout buying targets supporting nonvoters \((x_i \geq 0)\). With double persuasion, the machine must compensate opposing nonvoters for: (1) voting against their political preferences; and (2) their disutility from voting relative to abstaining.
Optimal Mix of Clientelist Strategies

Given this information about required payments, we determine the optimal mix of clientelist strategies. This section provides intuition about how a machine optimally allocates resources across vote buying, turnout buying, abstention buying, and double persuasion in order to maximize its electoral prospects. The appendix provides proofs of each proposition.

The machine adapts its clientelist payments to the reservation prices of citizens (based on their ideological and voting costs, in accordance with Equations 2–5), and targets those who deliver net votes most cheaply. Otherwise, the machine would be better off shifting resources to obtain additional electoral support. The machine is willing to pay twice as much to the most-expensive vote-buying recipient (a payment of $b^*_{VB}$) as it is willing to pay to the most-expensive turnout-buying, abstention-buying, and double-persuasion recipients (payments of $b^*_{TB}$, $b^*_{AB}$ and $b^*_{DP}$, respectively). After all, vote buying delivers twice as many net votes as the other three strategies. By the same logic, the machine is willing to pay the most expensive turnout-buying recipient exactly as much as it pays the most expensive abstention-buying or double-persuasion recipient, because they both yield one net vote. In sum, as shown formally in the appendix:

**Proposition 1**: The machine optimally sets $b^*_{VB} = 2b^*_{TB} = 2b^*_{AB} = 2b^*_{DP}$.

Note that although these are the most expensive payments for each strategy, not all recipients will obtain such large handouts, as explored below. The machine pays citizens according to reservation prices, which depend on each individual’s ideological preferences and voting costs.\(^{22}\) For notational simplicity, analysis below drops subscripts, letting $b^*_{VB} = b^{**}$ and $b^*_T = b^*_{AB} = b^*_{DP} = b^*$. An important finding follows. Observe in Proposition 1 that if $b^*_{VB}$, $b^*_{TB}$, $b^*_{AB}$, or $b^*_{DP}$ is greater than 0, then all four terms must be greater than 0. Thus:

**Proposition 2**: If a machine engages in electoral clientelism, then it optimally engages in all four strategies of vote buying, turnout buying, abstention buying, and double persuasion.

Whereas most studies focus exclusively on vote buying, Proposition 2 suggests that ma-\(^{22}\)More specifically, payments are given by the payment equations (2-5) for each respective strategy.
chines never optimally expend all their resources on just one strategy. Mobilization and 
demobilization are also fundamental to the logic of electoral clientelism.

Another important implication pertains to double persuasion. This strategy might not 
seem intuitive — why distribute benefits to citizens who neither vote nor support the ma-
chine? Indeed, Dunning & Stokes (2009) even call double persuasion a “perverse strategy.” 
Yet our model suggests that machines optimally engage in double persuasion. When opera-
tives distribute rewards, they find that targeting weakly opposing nonvoters through double 
persuasion is often more cost-effective than buying votes of strongly opposed voters, or buy-
ing turnout of supporting nonvoters with high voting costs.

Who Gets Bought?

Given that the machine optimally combines all four strategies, how does it determine 
which citizens to buy? Formal proofs in the appendix provide insight into this key question. 
Here we discuss graphical intuition of our findings. Figure 3 adds four shaded regions to 
Figure 2, representing citizens who are targeted with each strategy. The location of these 
shaded regions corresponds to the typology in Figure 1 (e.g., turnout buying is in the top right 
corner of Figures 1 and 3), because our model operationalizes the typology’s two dimensions.

For further intuition about how the machine allocates resources, we identify the most-
expensive payments for each strategy. First, consider who receives the most-expensive 
turnout-buying payment ($b^*$). Given that the machine neither overpays nor underpays, 
it delivers $b^*$ to supporting nonvoters who require exactly that level of benefits to come to 
the polls. Such supporting nonvoters are those along the turnover buying line ($l_4$), right of 
the vertical axis.\footnote{In accordance with Equation 3, these are supporting nonvoters of type $t_k = (x_k, c_k)$ for whom $b^* = c_k - x_k + x^M$. It follows that $l_4$ is given by the equation $c = x - x^M + b^*$, on the domain from the vertical axis to $X^M$.} The turnout buying line is parallel to the right section of the vertex 
($l_1$), and the vertical distance between these two lines is $b^*$. In other words, all voters along 
the turnout buying line receive the same payment, because the higher voting costs of some 
citizens on this line are balanced by their stronger preferences for the machine’s platform.
For double persuasion, the machine delivers the most-expensive double-persuasion payment ($b^*$) to opposing nonvoters who require exactly that level of benefits to turn out and vote for the machine. Such opposing nonvoters are those along the double persuasion line ($l_5$), left of the vertical axis.\textsuperscript{24} Observe that the double persuasion line and the turnout buying line ($l_4$ and $l_5$) intercept the vertical axis at the same point, because the most-expensive payments for these two strategies are the same.

Next, consider who receives the most-expensive vote-buying payment ($b^{**}$). Given that the machine neither overpays nor underpays, it delivers $b^{**}$ only to opposing voters who require exactly that level of benefits to switch their vote choices. However, a crucial point is that the machine only provides the most-expensive vote-buying payment to a subset of these opposing voters — those located on the vote buying line ($l_3$) in Figure 3.\textsuperscript{25}

To see why, note that the machine faces a dual choice when rewarding opposing voters

\textsuperscript{24}In accordance with Equation 5, these are opposing nonvoters of type $t_1 = (x_l, c_l)$ for whom $b^* = c_l - x_l + x^M$. It follows that $l_5$ is given by the equation $c = x - x^M + b^*$, on the domain from the point where $l_5$ intersects with $l_2$ to the vertical axis.

\textsuperscript{25}In accordance with Equation 2, these are opposing voters of type $t_j = (x_j, c_j)$ for whom $b^{**} = -2x_j$. 

— it can deliver benefits in exchange for vote-switching (vote buying) or for staying home (abstention buying). Intuitively, vote buying yields double the net votes, so it is more attractive to pay a citizen to switch her vote, unless doing so is more than twice as expensive as paying her to stay at home. Therefore, given the required payments for each strategy (Equations 2 and 4), the machine chooses vote buying under the following condition:

\[
\begin{align*}
b_{VB}^* & \leq 2b_{AB}^* \\
-2x_j & \leq 2[-x_j - x^M - c_j] \\
c_j & \leq x^O
\end{align*}
\]  

This condition is shown in Figure 3 as the strategy equivalence line \((l_6)\). If the machine rewards an opposing voter located on or below \(l_6\), vote buying is more cost-effective. If the machine rewards an opposing voter located above \(l_6\), abstention buying is more cost-effective.

Given this condition, we can also determine who receives the most-expensive abstention-buying payment \((b^*)\). The machine delivers \(b^*\) to opposing voters who require exactly that level of benefits to stay home. Such opposing voters are located on the abstention buying line \((l_7)\), which extends from \(X^O\) to the point where \(l_7\) intercepts with \(l_6\).

The discussion thus far provides intuition about whom the machine buys with its most-expensive payments \((b^* \text{ and } b^{**})\): citizens on the turnout buying line receive payments of \(b^*\), citizens on the double persuasion line receive payments of \(b^*\), citizens on the vote buying line receive payments of \(b^{**}\), and citizens on the abstention buying line receive payments of \(b^*\). Another key insight is that the machine optimally buys all citizens whose required payments are less than or equal to the most-expensive payments for each respective strategy. That is, the machine buys all citizens in the shaded areas in Figure 3. For further intuition, assume a voter \(X\) weakly opposes the machine and requires a vote-buying payment \(b'\), which is smaller than \(b^{**}\). If the machine vote buys an opposing voter \(Y\) for \(b^{**}\), then it must

---

26 We assume that if both strategies are equally cost-effective, the machine engages in vote buying.
27 Line segment \(l_6\) is given by the equation \(c = x^O\), on the domain from \(X^O\) to the vertical intercept.
28 In accordance with Equation 4, these are opposing voters of type \(t_h = (x_h, c_h)\) for whom \(b^* = -x_h - x^M - c_h\). It follows that \(l_7\) is given by the equation \(c = -x - x^M - b^*\), on the domain from \(X^O\) to the point where \(l_7\) intercepts with \(l_6\).
also vote buy X, because she provides the same number of net votes for a smaller payment. Otherwise, the machine would be better off buying X instead of Y, and reallocating the savings. Note the machine optimally pays X exactly her required payment, as it does not “overpay” in equilibrium. Such logic also applies for turnout buying, abstention buying, and double persuasion.

The model also offers insight about whom the machine does not buy. Formal analysis suggests the machine optimally distributes no benefits to opposing voters who require payments greater than $b^{**}$, or to nonvoters who require payments greater than $b^*$. Graphically, the machine buys no citizens outside the shaded areas in Figure 3. For further intuition, assume that a voter Z strongly opposes the machine and requires a vote-buying payment $b''$, which is greater than $b^{**}$. Observe that even the most-expensive vote-buying payment $b^{**}$ “underpays” Z and is not enough to persuade her to switch her vote. It cannot be optimal for the machine to expend resources on citizens requiring vote-buying payments larger than $b^{**}$, for such payments would not alter their behavior and would constitute wasted expenditures. The logic is analogous for turnout buying, abstention buying, and double persuasion.

Taken together, these findings suggest the optimal mix of clientelist strategies:

**Proposition 3: Optimal Mix of Strategies**

- **Vote Buying**: If $b_i^{VB} \leq b^{**}$ and $c_i \leq x^O$, pay an opposing voter $b_i^{VB}$
- **Turnout Buying**: If $b_i^{TB} \leq b^*$, pay a supporting nonvoter $b_i^{TB}$
- **Abstention Buying**: If $b_i^{AB} \leq b^*$ and $c_i > x^O$, pay an opposing voter $b_i^{AB}$
- **Double Persuasion**: If $b_i^{DP} \leq b^*$, pay an opposing nonvoter $b_i^{DP}$
- **No Payment**: Make no payment to all other citizens

The appendix provides a formal derivation of these equilibrium conditions, and shows how the machine determines $b^*$ and $b^{**}$. In order to explore why this optimal mix differs across electoral contexts, we now examine comparative statics.
Comparative Statics

The model offers insights into how the political environment in which a machine operates shapes its portfolio of clientelism. Machines optimally tailor their mix of clientelist strategies to at least five characteristics of political environments: (1) compulsory voting, (2) strength of ballot secrecy, (3) salience of political preferences, (4) political polarization, and (5) level of machine support. This section provides intuition about how each factor influences the optimal mix, based on analytical solutions derived in the appendix.

More specifically, formal analysis indicates how a machine optimally changes the quantity of citizens bought with each strategy in response to parameter shifts in the model. In response to such changes, machines alter which citizens they buy by reallocating resources across and within strategies of electoral clientelism. Changes in the political environment affect the number of cheap targets — such as Veronica and Tomas in the stylized example discussed above — whom the machine can buy with each strategy. Thus, machines reallocate resources towards strategies that now offer additional cheap targets. Machines also reallocate resources within a given strategy to ensure that they continue to buy the cheapest citizens. For tractability, comparative statics examine the case where $x_i$ and $c_i$ are distributed uniformly.

Where possible, we examine empirical evidence related to the predictions of each comparative static. As discussed above, the paucity of data on distinct strategies of electoral clientelism (especially across time or space) impedes rigorous testing of comparative statics. Nevertheless, our formal findings yield important insights and lay the groundwork for future empirical research.

(1) Compulsory Voting. Few institutional changes affect voting behavior as dramatically as the introduction of compulsory voting. Over 30 countries have introduced compulsory voting for a variety of reasons (IDEA 2009). While scholars such as Lijphart (1997) suggest that compulsory voting may reduce political inequality by encouraging electoral participation, our analysis predicts that introducing this rule has unintended consequences with respect to clientelism. Several analysts purport that compulsory voting reduces vote buying,
because it increases how many purchased voters are needed to influence an election (e.g., Donaldson 1915; Uwanno & Burns 1998; Dressel 2005). For example, Schaffer (2008: 124) argues that compulsory voting “provides an institutional disincentive for vote buying: by expanding the electorate it makes vote buying more expensive.” But contrary to what such analysts might predict, countries with compulsory voting often have relatively higher rates of vote buying. While the prevalence of vote buying depends on various factors (some explored below), it deserves mention that a recent survey of over 37,000 citizens across the Americas reveals that vote buying is twice as prevalent in countries where voting is mandatory.\(^{29}\)

Our model examines specific mechanisms by which compulsory voting affects clientelist strategies, and predicts that — holding other factors equal — the introduction of compulsory voting actually increases the prevalence of vote buying. To analyze the effects of compulsory voting, we unpack citizens’ net voting costs such that \(c_i = n_i - a\), where \(a \geq 0\) represents the fines or other penalties formally imposed on nonvoters through a compulsory voting law.\(^{30}\) Higher abstention costs boost turnout and shift the vertex upwards (compare Figures 3 and 4a). This upward shift increases the number of cheap vote-buying targets (such as Veronica in the stylized example), who are weak opposing voters clustered along the vertical axis under the vertex. In order to buy these newly introduced cheap targets for vote buying, the machine: (1) reallocates resources from turnout buying, double persuasion, and abstention buying towards vote buying, and (2) reallocates resources within vote buying from the most-expensive recipients towards the newly introduced cheap targets. Consequently, the prevalence of vote buying increases \((\frac{\partial VB}{\partial a} > 0)\) while turnout buying, abstention buying, and double persuasion all decrease \((\frac{\partial TB}{\partial a} < 0, \frac{\partial AB}{\partial a} < 0, \frac{\partial DP}{\partial a} < 0)\).

The findings of a recent field experiment in Peru are consistent with our model’s pre-

\(^{29}\)Survey conducted by the Latin American Public Opinion Project of Vanderbilt University. In the 13 countries with compulsory voting, 10.9 percent of citizens reported receiving offers of material benefits in exchange for their votes “sometimes” or “often,” versus only 5.3 percent in the 11 countries with optional voting. Removing Canada and the U.S. from the sample increases the prevalence of vote buying in countries with optional voting to 6.1 percent (N=9). In either case, the difference is statistically significant in a two-tailed t-test (at the 99 percent level).

\(^{30}\)Note that \(n_i\) captures all other net costs of voting (i.e., voting costs and other abstention costs such as social disapprobation).
diction about the impact of compulsory voting on vote buying. Leon (2011) examines the impact of a steep reduction in the penalties imposed on nonvoters. In 2006, the Peruvian government decreased compulsory voting penalties from approximately $50 to as low as $6 in the poorest districts. Given that this institutional shift remained almost entirely unpublicized, Leon (2011) conducted an experiment by randomly providing information about the penalty reductions. Observe that our model predicts that this decrease in abstention costs \( a \) will reduce turnout, and as a consequence, lead to a decline in vote buying. These predictions match the findings in Leon (2011): Peru’s reduction in penalties for abstention caused significant declines in both electoral participation and vote buying. Most important for this discussion, the study finds that “a decrease in the cost of abstention reduces the incidence of vote buying by 20%” (Leon 2011: 4).

Although the Peruvian study examines only vote buying, other studies also provide evidence about the impact of compulsory voting on different strategies of electoral clientelism. Evidence from both Australia and Belgium is consistent with the predictions of our model. In an analysis of the overall decline of clientelism in Australia, Orr (2003: 133) suggests that compulsory voting decreased turnout buying: “As a final nail in the coffin, compulsory enrolment and voting in Australia assisted, by guaranteeing high turnouts and thereby out-flanking bribery to ‘get-out-the-vote.’” Furthermore, Malkopoulou (2009: 10) suggests Belgium introduced compulsory voting in 1893 in part to reduce abstention buying, and concludes that compulsory voting laws “may still be a useful mechanism to prevent electoral corruption and abstention-buying in countries that feature large economic divides and labour dependence.” Overall, in line with these authors’ findings, the model’s comparative statics predict how compulsory voting affects each strategy of electoral clientelism.

(2) Secret Ballot. Especially since its 1856 adoption in Australia, the secret ballot has emerged as one of the most ubiquitous electoral institutions in the world. In theory, the secret ballot renders vote buying unenforceable because machines cannot verify whether reward recipients actually switch their vote choices. But in practice, machines employ a
variety of tactics to violate ballot secrecy. For example, parties in the Philippines give out carbon paper so voters can copy their ballots, and Italian parties lend mobile phones with cameras so reward recipients can photograph how they vote (Schaffer & Schedler 2007, 30–31). Although such tactics continue to facilitate vote buying, it is generally accepted that the secret ballot reduces vote buying by making it costlier to monitor vote choices (e.g., Cox & Kousser 1981; Rusk 1974; Stokes 2005).

Evidence also suggests that ballot secrecy affects abstention buying (e.g., Cox & Kousser 1981; Heckelman 1998). Most prominently, a quantitative study of rural newspaper articles by Cox & Kousser (1981) finds that abstention buying (what they call “deflationary fraud”) increased when ballot secrecy was introduced in New York state. They quote a Democratic state chairman: “Under the new ballot law you cannot tell how a man votes when he goes into the booth, but if he stays home you know you have got the worth of your money” (1981: 656). Whereas Cox & Kousser (1981) do not conduct formal analyses, our model illustrates the logic behind their findings. As an additional contribution, our model also helps to explain a counterintuitive result in their analysis (discussed below).

The model’s comparative statics offer insights into the effects of ballot secrecy on each
strategy. To analyze these effects, we relax the assumption that the machine can costlessly monitor vote choices and sanction reward recipients who vote against the machine. The machine incurs these costs, which are captured by a parameter $\beta \geq 1$, when rewarding citizens who prefer the opposition. Introducing $\beta$ changes the payment equations for vote buying, $b^v_b = \beta(-2x_i)$, and double persuasion, $b^d_p = \beta(c_i - x_i + x^M)$, given that both strategies target opposers.\(^3\) Recall from Proposition 1 that without the secret ballot, the most expensive price the machine optimally pays for vote buying is twice as much as for the other strategies: $b^v_b^* = 2b^t_b^* = 2b^d_p^* = 2b^a_b^*$. As shown in the appendix, a machine facing ballot secrecy takes into account the cost of monitoring and sanctioning opposers when setting the most expensive payments: $\beta(b^v_b^*) = 2\beta(b^t_b^*) = \beta(2b^d_p^*) = 2\beta(b^a_b^*)$. Given that ballot secrecy makes strategies targeting opposers more expensive, the machine engages in less vote buying and double persuasion ($\frac{\partial \alpha}{\partial \beta} < 0, \frac{\partial \beta}{\partial \beta} < 0$), and more abstention buying and turnout buying ($\frac{\partial \alpha}{\partial \beta} > 0, \frac{\partial \beta}{\partial \beta} > 0$). For a graphical representation of these effects, compare Figures 3 and 4b.

These predictions are consistent with Cox & Kousser’s (1981) finding that ballot secrecy increases abstention buying and provide insights about mechanisms underlying this change. Our model also helps to explain a puzzling finding in Cox & Kousser’s quantitative analysis with respect to “inflationary fraud” — their term for payments to voters that increase the machine’s vote tally. The authors find that inflationary fraud remained relatively constant with the introduction of the secret ballot law (1981: 657). This finding ostensibly contradicts the observations of many scholars and journalists who posit that the introduction of ballot secrecy substantially decreased vote buying in the U.S.\(^3\) Our model provides an explanation for this apparent discrepancy. When tallying inflationary fraud, Cox & Kousser lumped together vote buying and turnout buying because both strategies “inflate” the number of

\(^3\)The original payment equations for these strategies (Equations 2 and 5) are a special case of this more general setup where $\beta = 1$.

\(^3\)For example, see Rusk (1974); Heckelman (1998); “Election Corruption in New York State,” The Evening Post: New York, January 8, 1917; and “Here and There,” The Niagara Falls Gazette, October 10, 1936.
votes received by the machine. But ballot secrecy has opposite effects on vote buying and turnout buying. The authors thus conflate two strategies with countervailing effects, which helps explain why they find no effect of the secret ballot. It should be noted that historical New York newspapers emphasized machines’ use of turnout buying — not just abstention buying — after the introduction of the secret ballot. For example, the *New York Herald* observed in 1912 that some partisan supporters “refuse to vote at all unless they are paid for it . . . Their plea is that they must have a few dollars to compensate them for their ‘loss of time’ in going to the polls.” Even a *New York Times* article cited by Cox & Kousser (1981) discusses turnout buying as well as abstention buying in 1894: “Ten times that amount, it is said by visitors of that county, is needed to properly get out such voters as desired and keep others at home.” Overall, our model predicts that ballot secrecy influences all strategies of electoral clientelism, not just vote buying and abstention buying as recognized by the existing literature.

(3) *Salience of Political Preferences.* In addition to institutional factors, the model suggests that characteristics of the electorate also affect machines’ mix of clientelistic strategies. For various reasons, voters in some contexts place relatively more value on political preferences than material rewards. For example, many studies suggest that clientelism is more prevalent in poor or rural areas, where the electorate tends to be relatively less responsive to policy platforms than handouts (Kitschelt & Wilkinson 2007; Powell 1970). What the existing literature fails to clarify is that political salience has differential effects across strategies of electoral clientelism.

To explore this point, we analyze the salience of political preferences by introducing a...
parameter $\kappa > 0$ to the utility function of citizens (Equation 1): $U_i^M = -\kappa |x^M - x_i| - c_i$. The parameter $\kappa$ represents the importance of expressing one’s political preferences, relative to the cost of voting. As the salience of political preferences increases (i.e., $\kappa$ increases), the turnout indifference vertex becomes steeper and shifts downward. This downward shift decreases the number of cheap vote-buying targets (such as Veronica in the stylized example), who are weak opposing voters clustered along the vertical axis under the vertex. Given that the number of cheap vote-buying targets decreases, the machine decreases vote buying ($\frac{\partial VB}{\partial \kappa} < 0$) and increases turnout buying, abstention buying, and double persuasion ($\frac{\partial TB}{\partial \kappa} > 0$, $\frac{\partial AB}{\partial \kappa} > 0$, $\frac{\partial DP}{\partial \kappa} > 0$).

The model not only sheds light on how levels of political salience affects the mix of strategies, but also offers intriguing predictions about the effects of shocks to this factor. For example, consider the possibility that an economic shock during a campaign leads citizens to place greater value on clientelist handouts relative to political preferences (i.e., $\kappa$ decreases). The model predicts that such shocks would increase vote buying, as well as decrease other strategies. As shown in Figure 5a, the vertex becomes less steep and shifts upward, which increases the number of cheap vote-buying targets. Although further evidence is required to test predictions fully, newspaper reports suggest that consistent with our model, vote buying increases during economic shocks caused by droughts. As one article in the Philippines quotes a senatorial candidate: “The drought will lead to hunger and desperation, thus making vote-buying a more viable option for candidates with resources.” Similarly, an article on the impact of El Niño droughts in Northeast Brazil quotes a Catholic bishop: “It’s easier to buy votes when the people are starving and will agree to anything for food.”

Further research should explore how changes and levels of political salience affect machines’ mix of electoral clientelism. The model also provides insights about two other characteristics of political environments. We mention these findings briefly to identify directions

---

37 Observe that Equation 1 is a special case of this setup, in which $\kappa = 1$.
for future research, given that evidence about the following predictions remains unavailable.

(4) Machine Support. Another comparative static examines the level of political support for the machine. We conceptualize machine support as the proportion of citizens who prefer the machine’s platform over the opposition party’s platform. Comparative statics suggest that an increase in machine support increases turnout buying ($\frac{\partial TB}{\partial x} > 0$), decreases abstention buying ($\frac{\partial AB}{\partial x} < 0$), and has no effect on vote buying or double persuasion ($\frac{\partial VB}{\partial x} = 0$ and $\frac{\partial DP}{\partial x} = 0$, respectively). To analyze this comparative static, we unpack citizens’ political preferences such that $x_i = \bar{x} + \epsilon_i$, where $\bar{x}$ represents the political preferences of the median voter, and $\epsilon_i$ captures individual-specific deviation from the median voter.$^{40}$ A rise in support for the machine’s platform increases $\bar{x}$ and shifts the turnout indifference vertex left (compare Figures 3 and 5b). This leftward shift increases the number of cheap turnout-buying targets, who are supporting nonvoters clustered just above the righthand side of the vertex. In order to buy these supporting nonvoters, the machine reallocates resources from abstention buying to turnout buying. Substantively, this comparative static suggests that a machine

40The utility function for machine supporters (Equation 1) thus becomes: $U_i^M = -|x^M - (\bar{x} + \epsilon_i)| - c_i$. Observe that Equation 1 is a special case of this setup, in which $\bar{x} = 0$ (i.e., in the original setup, the machine party and opposition party have equal levels of political support).
operating in several political districts will optimally tailor its clientelist mix according to political support. When distributing benefits in districts with many loyalists, the machine employs relatively more turnout buying. But in opposition bailiwicks, it employs relatively more abstention buying.

(5) Political Polarization. The model’s comparative statics also suggest that characteristics of a party system influence the mix of electoral clientelism employed by a machine. We examine political polarization, which we conceptualize as the ideological distance between parties (formally, $|x^M - x^O|$). Increased political polarization is predicted to decrease vote buying ($\frac{\partial VB}{\partial(x^M - x^O)} < 0$), increase turnout buying ($\frac{\partial TB}{\partial(x^M - x^O)} > 0$), increase abstention buying ($\frac{\partial AB}{\partial(x^M - x^O)} > 0$), and increase double persuasion ($\frac{\partial DP}{\partial(x^M - x^O)} > 0$). Observe that as polarization increases, voters with moderate ideological preferences receive less expressive utility from voting, because the ideological distance from their preferred party grows. As a result, some voters no longer come to the polls, and the vertex shifts down (not shown graphically). This downward shift decreases the number of cheap vote-buying targets, who are weak opposing voters clustered along the vertical axis under the vertex. As the number of cheap vote-buying targets decreases, the machine: (1) reallocates resources from vote buying to turnout buying, abstention buying, and double persuasion, and (2) reallocates resources within vote buying from the lost cheap targets towards costlier opposing voters. Overall, the model suggests that machines rely relatively more on mobilizational strategies where political polarization is high, and rely relatively more on vote buying where it is low.

Overall, our model predicts that characteristics of political environments affect clientelist strategies as summarized in Figure 1 in the Introduction. Further empirical research is needed to understand more thoroughly the effects of the five factors discussed above, as well as to test rigorously the predictions of each comparative static. More broadly, the findings reveal and lay the groundwork for potentially fruitful research agendas that have thus far largely remained unexplored.
Discussion

This article provides insights into the logic of electoral clientelism. Although most studies focus exclusively on vote buying, our analysis suggests that political machines maximize their electoral prospects by using rewards for both persuasion and mobilization. We argue that machines are usually most effective when they combine at least four strategies — vote buying, turnout buying, abstention buying, and double persuasion. Overall, our analysis also unifies in a common framework how machines choose their particular mix of clientelism.

This study has identified numerous reasons why political machines often adopt different portfolios of clientelist strategies. Machines consider both individual and contextual factors when deciding how to distribute benefits during campaigns. Two attributes of individuals — political preferences and voting costs — determine the prevalence of cheap targets for each strategy. Machines also adapt their mix of clientelist strategies to contextual factors. For example, our model suggests that relatively more vote buying will be observed in contexts with compulsory voting, weak ballot secrecy, low salience of political preferences, and low political polarization. By contrast, relatively more turnout buying is predicted in contexts with optional voting, strong ballot secrecy, high salience of political preferences, strong machine support, and high political polarization.

An essential next step is testing our predictions rigorously. Empirical tests should rely on both quantitative and qualitative methods, employing enhanced data collection and identification strategies. To date, analysis of varieties of clientelism has been hampered by data collection efforts that focus exclusively on vote buying. To address this issue, survey and interview research should explicitly attempt to ascertain whether rewards are used to influence vote choices or induce electoral participation. For example, panel surveys could help identify the relative prevalence of strategies by capturing ex ante partisan preferences and inclination to vote (i.e., before receiving rewards). Another potentially fruitful approach to studying varieties of clientelism may involve more rigorous analysis of aggregate data.

In addition to rigorous empirical testing, another productive direction for future research
involves further formal analysis. This paper has focused on analyzing how and why a machine combines four strategies of electoral clientelism — vote buying, turnout buying, double persuasion and abstention buying. Our aim has been to develop a formal model that is widely accessible and that contributes both conceptual clarity and analytical rigor to research on machine politics. We have thus sought to maintain comparability to two influential articles: Stokes’s (2005) study of vote buying and Nichter’s (2008) study of turnout buying. One consequence is that we focus on contexts where one or more machines may operate, but where each machine controls different communities. Although we agree with Stokes (2005, 324) that “dueling machines” is a relatively unusual phenomenon, we acknowledge that in some contexts such as Zambia, multiple machines may engage in direct competition by offering rewards to the same citizens. A particularly useful further line of formal analysis might therefore ask: How would two or more machines allocate resources across clientelist strategies in a context of direct competition?

To examine this question, one could move away from Stokes’s (2005) original game by introducing a second machine party into the analysis. As in our current setup, the two parties can be modeled as having opposite policy preferences, but the opposition party would also offer targeted handouts. Each machine would seek to maximize net votes subject to a budget constraint. Such analysis, however, presents significant challenges. A distributional conflict involving two competing parties with more than two targets is likely to resemble blotto games, which generally do not have pure-strategy equilibria and often have very complicated mixed-strategy equilibria (Golman & Page 2009). To overcome this challenge, restrictive assumptions would have to be made. For example, parties could make clientelist offers sequentially, such that one party makes the first offer and the second party counters. Additional assumptions would then need to be imposed about whether there is a fixed order of offers and counteroffers, or whether both machines can make multiple offers during a specified time interval. Such a setup raises numerous possibilities, such as one machine preemptively buying a supermajority in order to intimidate the opposition from counteroffering (e.g.,
Future formal work should explore the extent to which electoral clientelism differs in contexts where “dueling machines” directly compete to offer rewards to the same citizens.

There are other important avenues of research for formal analyses to investigate. Our analysis of comparative statics assumes that political preferences and voting costs (i.e., $x_i$ and $c_i$) are distributed uniformly. This simplifying assumption facilitates analysis of whether changes in contextual factors increase or decrease the prevalence of each strategy. Varying the distribution of $x_i$ and $c_i$ to reflect specific political environments would provide further insights, such as the effect of contextual factors on the overall prevalence of electoral clientelism. In addition, future research should examine the way in which regime type affects the mix of electoral clientelism. For example, although many authoritarian regimes distribute benefits during elections (e.g., Blaydes 2010; Magaloni 2006), they may be more likely to use coercive measures while engaging in clientelist exchanges. Formal examination of such factors, as well as potential interactions across factors, would further enhance our understanding of electoral clientelism.

Expanding formal and empirical analyses beyond elections is also crucial. The present paper focuses exclusively on electoral clientelism, which provides all benefits before voting. This focus provides valuable insights about strategies that remain poorly understood, but clientelism obviously involves a broader set of strategies than just elite payoffs to citizens at election time. An important avenue for further research is understanding the mechanisms that facilitate such relational clientelism, which involves ongoing relationships and promises of future benefits. A related issue is the link between electoral clientelism and relational clientelism. For example, do longer-term clientelist relationships typically represent substitutes for — or complements to — vote buying and turnout buying? And more broadly, given that clientelist strategies are part of a portfolio of tools for obtaining electoral support (Estévez, Magaloni & Diaz-Cayeros 2002; Calvo & Murillo 2010: 5–6), how do parties allo-

---

41 Groseclose & Snyder (1996) focuses exclusively on vote buying and does not consider the possibility that voters do not turn out on Election Day.
cate resources between clientelist and programmatic strategies (e.g., campaign advertising)?

Such questions provide important directions for future research on clientelism, a topic with significant policy implications. With respect to the present study, our findings suggest that policy shifts may shape the mix of strategies employed by political machines, with potentially serious implications. Different strategies may entail distinct political and social consequences. For example, our model predicts that the introduction of compulsory voting decreases turnout buying and increases vote buying. Yet the normative implications of inducing turnout may well be less pernicious than paying citizens to vote against their preferences (Hasen 2000, 1375–8, 1370). Given such normative considerations, further research on how different policies affect patterns of clientelism could help inform policy debates.

References


American Political Science Association, Washington, D.C.


Prepared for the Workshop on Democratic Accountability Strategies, Duke University.


**Appendix**

We refer to opposing voters as $OV$; to supporting nonvoters as $SNV$; and to opposing nonvoters as $ONV$.

Also, for notational simplicity, let $h = g(c)f(x)dc dx$, $r = x - x^M$, and $s = -x - x^M$. The proofs to Propositions 1 and 3 make use of the following lemma:

**Lemma 1**: For any allocation of budget $B$, a machine could buy more citizens if it had additional resources.

35
of any positive amount.

Proof. Let $A$ be an allocation of budget $B$. Define $M(A)$ to be the set of citizens who vote for a machine given this allocation: $M(A) \equiv \{ (x_i, c_i) : b_i \geq \bar{b}_i \}$, where $b_i$ is the payment received by citizen $i$ under allocation $A$ and $\bar{b}_i$ is the payment required to buy this citizen. Limited resources means that for any allocation $A$, a machine cannot afford to buy all citizens: $\int \int \bar{b}_i h > B$. It follows that there exists a set $Q \notin M(A)$ of positive measure such that $\bar{b}_i > b_i$ for all $(x_i, c_i) \in Q$. Let $(\hat{x}_i, \hat{c}_i)$ be any point on the interior of $Q$ and select $\eta$ sufficiently small such that $\Delta(\eta) \equiv [\hat{x}_i, \hat{x}_i + \eta] \times [\hat{c}_i, \hat{c}_i + \eta] \subset Q$. Let $\theta > 0$ represent some nonzero amount of resources. Then by the continuity of $f(x)$ and $g(c)$, there exists a $\eta_0 < \eta$ such that for any $\theta$, a machine can afford to buy all citizens in $\Delta(\eta_0)$: $\int_{\Delta(\eta_0)} \bar{b}_i h \leq \theta$. \hfill \square

Proposition 1: In an optimal allocation of resources, a machine sets $b^*_{VB} = 2b^*_{TB} = 2b^*_{DP} = 2b^*_{AB}$.

Proof. We will show (i) $b^*_{TB} = b^*_D$, and (ii) $b^*_{DP} = 2b^*_{TB}$. (The proof to $b^*_{TB} = b^*_AB$ follows identical logic).

(i) Let $b^*_{TB}$ and $b^*_{DP}$ be the upper bounds on a machine’s payments to SNV and ONV, respectively. For contradiction, assume $A$ is an optimal allocation in which $b^*_{TB} \neq b^*_{DP}$. Without loss of generality, say $b^*_{TB} > b^*_{DP}$. We will show there exists an allocation $A'$ that is affordable and produces a strictly greater number of net votes. Thus, $A$ cannot be optimal.

Let $S$ be a set with positive measure of SNV such that all citizens in set $S$ have a required payment $\bar{b}_i = b^*_{TB}$. Let $(\hat{x}, \hat{c})$ be any point on the interior of $S$ and take $\delta$ small enough such that $\Delta(\delta) \equiv [\hat{x}, \hat{x} + \delta] \times [\hat{c}, \hat{c} + \delta] \subset S$. Recall from Lemma 1 that $Q$ is a set of citizens who remain unbought under allocation $A$. Let $R \subset Q$ be a set with positive measure of ONV such that all citizens in set $R$ have a required payment $b^*_{TB} > \bar{b}_i > b^*_{DP}$. Let $(\hat{x}, \hat{c})$ be any point on the interior of $R$. Take $\mu$ small enough such that $\Delta(\mu) \equiv [\hat{x}, \hat{x} + \mu] \times [\hat{c}, \hat{c} + \mu] \subset R$. By the continuity of $f(x)$ and $g(c)$, there exists a $\delta_0 < \delta$ and a $\mu_0 < \mu$ such that $\int_{\Delta(\delta_0)} h = \int_{\Delta(\mu_0)} h$ (call this Equation A1). Observe that $\Delta(\delta_0)$ and $\Delta(\mu_0)$ have the same number of citizens, so buying either set produces the same net votes. Let $\theta \equiv \int_{\Delta(\delta_0)} \bar{b}_i h - \int_{\Delta(\mu_0)} \bar{b}_i h$ and note $\theta > 0$ because citizens on $\Delta(\delta_0)$ are more expensive than those on $\Delta(\mu_0)$. Finally, let $\Delta(\eta_0)$ be a set of citizens who are mutually exclusive of set $\Delta(\mu_0)$ and who do not receive rewards under allocation $A$. Formally, $\Delta(\eta_0) \subset Q$ and $\Delta(\mu_0) \cap \Delta(\eta_0) = \emptyset$.

Consider an allocation $A'$ in which a machine buys all citizens in $\Delta(\mu_0)$, reduces payments to citizens on $\Delta(\delta_0)$ to zero, and redistributes the savings to citizens in $\Delta(\eta_0)$. Recall from Lemma 1 that citizens on $\Delta(\eta_0)$ can be be bought with resources $\theta$. Formally, define $\Omega \equiv [X, X] \times [0, \overline{c}] - (\Delta(\delta_0) \cup \Delta(\mu_0) \cup \Delta(\eta_0))$. Let $A' = A$ for all $(x_i, c_i)$ on $\Omega$, $A' = 0$ for all $(x_i, c_i)$ on $\Delta(\delta_0)$, and $A' = \bar{b}_i$ for all $(x_i, c_i)$ on $\Delta(\mu_0)$ and for all $(x_i, c_i)$ on $\Delta(\eta_0)$. The cost of $A'$ is $\leq$ the cost of allocation $A$, and $A'$ buys $\int_{\Delta(\eta_0)} h$ more citizens. Thus $A$ cannot be an optimal allocation.
To show \( b_{TB}^* = 2b_{TB}^* \) (or, equivalently, \( b_{V}^* = 2b_{DP}^* \) or \( b_{T}^* = 2b_{AB}^* \)), we repeat the proof that \( b_{TB}^* = b_{DP}^* \), replacing Equation (A1) with \( \int_{(\delta_0)} h = 2 \int_{(\mu_0)} h \), where \( \Delta(\delta_0) \) is a subset of \( OV \) for whom \( \bar{\theta}_i = b_{TB}^* > 2b_{TB}^* \), and where \( \Delta(\mu_0) \) is a subset of \( SNV \) for whom \( \frac{1}{2}b_{VB}^* > \bar{\theta}_i > b_{TB}^* \).

**Proposition 2:** If a machine engages in electoral clientelism, then optimally it allocates resources across all three strategies of vote buying, turnout buying, and double persuasion.

**Proof.** Let \( b_{TB}^* = b^* \) and \( b_{TB}^* = b_{DP}^* = b_{AB}^* = b^* \). In an optimal allocation, the number of vote-buying recipients is \( VB = N \int_0^\infty x^\theta \int_{\mu} x^\gamma h \) (Equation A2), the number of turnout-buying recipients is \( TB = N \int_0^1 x^\theta \int_{\mu} x^\gamma h \) (Equation A3), the number of double-persuasion recipients is \( DP = N \int_0^\infty x^\theta \int_{s} x^\gamma h \) (Equation A4), and the number of abstention buying recipients is \( AB = N \int_0^\infty x^\theta \int_{s} x^\gamma h \) (Equation A5). By Proposition 1, \( b^* = 2b^* \), so \( b^* > 0 \iff b^* > 0 \). It then follows from equations A2, A3, A4, and A5 that \( VB > 0 \iff TB > 0 \iff DP > 0 \iff AB > 0 \).

**Proposition 3:** If \( \bar{\theta}_i \leq b^* \) and \( c_i \leq x^O \), a machine pays \( \bar{\theta}_i \) to a \( OV \). If \( \bar{\theta}_i \leq b^* \) and \( c_i > x^O \), a machine pays \( \bar{\theta}_i \) to a \( OV \). If \( \bar{\theta}_i \leq b^* \), a machine pays \( \bar{\theta}_i \) to a \( SNV \). If \( \bar{\theta}_i \leq b^* \), a machine pays \( \bar{\theta}_i \) to a \( ONV \). All other citizens receive no payment.

**Proof.** We prove the TB case; identical logic holds for other strategies. We show (i) if \( \bar{\theta}_i \leq b^* \), a machine pays \( \bar{\theta}_i \) to a \( SNV \); (ii) if \( \bar{\theta}_i > b^* \), a machine offers \( b_i = 0 \) to a \( SNV \).

(i) Let \( b^* \) be the upper bound on payments a machine makes to \( SNV \). Define \( M(A) \) to be the set of \( SNV \) who vote for the machine given the payment allocation \( A \). For contradiction, assume \( A \) is an optimal allocation in which the machine does not buy all \( SNV \) who are cheaper than \( b^* \). Formally, there exists a set \( Z \) with positive measure of \( SNV \) receiving \( b_i < \bar{\theta}_i < b^* \). We will show there exists a \( A' \) that is affordable and produces a strictly greater number of net votes. Thus, \( A \) cannot be optimal.

Let \( (\hat{x}, \hat{c}) \) be any point on the interior of \( M(A) \) and take \( \delta \) small enough such that \( \Delta(\delta) \equiv [\hat{x} + \delta] \times [\hat{c} + \delta] \subset M(A) \). Let \( (x_i, c_i) \) be any point in \( Z \) and select \( \mu \) sufficiently small such that \( \Delta(\mu) \equiv [\hat{x} + \mu] \times [\hat{c} + \mu] \subset Z \). By the continuity of \( f(x) \) and \( g(c) \) there exists a \( \delta_0 < \delta \) and \( \mu_0 < \mu \) such that \( \int_{\Delta(\delta_0)} h = \int_{\Delta(\mu_0)} h \). Observe that \( \Delta(\delta_0) \) and \( \Delta(\mu_0) \) have the same number of \( SNV \), so buying either set produces the same net votes. Let \( \theta \equiv \int_{\Delta(\delta_0)} b_i h - \int_{\Delta(\mu_0)} \bar{\theta}_i h \) and note that \( \theta > 0 \) because citizens in \( \Delta(\mu_0) \) are cheaper than those in \( \Delta(\delta_0) \). Consider an allocation \( A' \) in which a machine buys all citizens in \( \Delta(\mu_0) \), reduces payments to citizens in \( \Delta(\delta_0) \) to zero, and redistributes the savings to citizens in \( \Delta(\eta_0) \). Recall from Lemma 1 that \( \Delta(\eta_0) \) is a set of citizens who remain unbought under allocation \( A \), and who could be bought with resources \( \theta \). Formally, define \( \Omega \equiv [\hat{x}, \hat{c}] \times [0, \bar{\theta}] - (\Delta(\delta_0) \cup \Delta(\mu_0) \cup \Delta(\eta_0)) \). Let \( A' = A \) for all \( x_i, c_i \) on \( \Omega \), \( A' = 0 \) for all \( x_i, c_i \) on \( \Delta(\delta_0) \), and \( A' = \bar{\theta}_i \) for all \( x_i, c_i \) on \( \Delta(\mu_0) \) and for all \( x_i, c_i \) on \( \Delta(\eta_0) \). The cost of \( A' \) is less than or equal to the cost of allocation \( A \) and \( A' \) buys \( \int_{\Delta(\eta_0)} h \) more citizens. Thus \( A \) cannot be an optimal allocation.
(ii) Recall that \( b^* \) is the upper bound on payments a machine makes to SNV. Offering \( b^* \) to a citizen for whom \( \bar{b}_i^{TB} > b^* \) is insufficient to induce turnout (i.e., it is an underpayment). Formally, underpayment can be defined as a set of positive measure \( P \) of SNV receiving rewards \( b_i \) such that \( \bar{b}_i > b_i > 0 \). For contradiction, assume \( A \) is an optimal allocation in which a machine underpays some SNV. We show there exists an affordable allocation \( A'' \) that produces strictly more net votes than \( A \). Thus, \( A \) cannot be optimal.

Define \( \theta \equiv \int_P b_i h \) as the resources the machine devotes to citizens in set \( P \). In allocation \( A, \theta > 0 \). Observe that since the machine underpays these citizens, it receives 0 net votes in return. Recall from Lemma 1 that a machine can purchase all citizens on set \( \Delta(\eta_0) \) for resources \( \theta \), where \( \Delta(\eta_0) \) are citizens who remain unbought under allocation \( A \). Consider an allocation \( A'' \) in which a machine reduces payments to citizens on set \( P \) to 0 and uses the savings to purchase citizens on set \( \Delta(\eta_0) \). Formally, define \( \Omega \equiv [X, \bar{X}] \times [0, C] - (P \cup \Delta(\eta_0)) \). Let \( A'' = A \) for all \( (x_i, c_i) \) on \( \Omega \). Define \( \bar{b}_i = \theta_i \) for all \( (x_i, c_i) \) on \( \Delta(\eta_0) \). Then the costs of \( A'' \) are \( \leq \) the costs of \( A \), and \( A'' \) buys \( \int_{\Delta(\eta_0)} h \) more citizens. Thus \( A \) cannot be an optimal allocation.

**Comparative Statics**

For analysis of comparative statics, we assume \( f \) and \( g \) are distributed uniformly. The machine’s constrained optimization problem, where \( \lambda \) is the Lagrangian multiplier, is:

\[
\max_{b_{TB}, b_{DP}, b_{VB}, \lambda} V^M - V^O - \lambda (E - B)
\]

The machine maximizes the difference between its votes \( (V^M) \) and opposition votes \( (V^O) \), given that total expenditures \( (E) \) must be less than or equal to its budget \( B \). Note that \( V^O = \int_X \frac{V}{C} \int_{\bar{C}}^{s-b_{AB}} h \) and \( V^M = V_B + TB + DP + S \), where: Vote Buying (VB) = \( \int_0^{\lambda V_B} \int_0^{\lambda V_B} h \), Turnout Buying (TB) = \( \int_0^{\lambda V_B} \int_0^{\lambda V_B} b \), Double Persuasion (DP) = \( \int_0^{\lambda V_B} \int_0^{\lambda V_B} h \), and Supporters (S) = \( \int_0^{\lambda V_B} \int_0^{\lambda V_B} h \). Total expenditures for the machine are \( E = V_{TB} + E_{TB} + E_{DP} + E_{AB} \), where: VB Expenditures \( (E_{VB}) = \int_0^{\lambda V_B} \int_0^{\lambda V_B} h \), TB Expenditures \( (E_{TB}) = \int_0^{\lambda V_B} \int_0^{\lambda V_B} b \), DP Expenditures \( (E_{DP}) = \int_0^{\lambda V_B} \int_0^{\lambda V_B} b \), and AB Expenditures \( (E_{AB}) = \int_0^{\lambda V_B} \int_0^{\lambda V_B} b \). Solving the problem yields four first order conditions. Solving all first order conditions for \( \lambda \) yields the results from Proposition 1: \( b_{VB}^* = 2b_{TB}^* = 2b_{DP}^* = 2b_{AB}^* \).

For the following analyses, let \( \Gamma = \frac{1}{\int_{\Delta} b} \). Recall that \( C < 0 \), \( X < 0 \), and \( X = -\bar{X} \).

**Compulsory Voting**: Substitute \( b^* = \frac{1}{2} b^* \) from the FOCs into the budget constraint. Implicit differentiation yields: \( \delta b^* = \frac{\delta b^*}{\delta a} = \frac{2b^*}{8(a+X-x-M-C)} < 0 \). Substitute \( b^* = 2b^* \) into the budget constraint. Implicit differentiation yields: \( \delta b^* = \frac{2b^*}{4(a+X-x-M-C)} < 0 \). Comparative statics follow: (1) \( \frac{\partial V_B}{\partial a} = \frac{1}{4} \left[ 4b^* - \frac{\partial b^*}{\partial a} \right] - b^* \frac{\partial b^*}{\partial a} - b^* \frac{\partial b^*}{\partial a} = 0 \). (2) \( \frac{\partial V_B}{\partial a} = \Gamma \frac{\partial b^*}{\partial a} < 0 \).

**Ballot Secrecy**: In the constrained optimization problem above, replace \( E_{VB} \) with \( \beta E_{VB} \) and \( E_{DP} \) with
$\beta E_{DP}$. The FOCS become $\beta b_{VB}^* = 2\beta b_{DP}^* = 2 b_{AB}^*$. Substitute $b_{DP}^* = \frac{1}{2} b_{VB}^*$ and $b_{TB}^* = b_{AB}^* = \frac{1}{2} b_{VB}^*$ from the FOCS into the budget constraint. Implicit differentiation yields:
\[
\frac{\partial \kappa_{MA}}{\partial x} = b_{VB}^* (5 - 2\beta b_{VB}^* - 12 (\beta M + C - 2\beta x)) < 0. \text{ Substitute } b_{VB}^* = 2 b_{DP}^* \text{ and } b_{TB}^* = b_{AB}^* = 2 b_{DP}^* \text{ and implicit differentiation yields:} \frac{\partial \kappa_{MA}}{\partial x} = b_{VB}^* (5 - 2\beta b_{VB}^* - 12 (\beta M + C - 2\beta x)) < 0. \text{ Let } b_{TB} = b_{AB} \text{ and substitute } b_{VB}^* = \frac{2}{\beta} b_{TB}^* \text{ and } b_{DP}^* = \frac{1}{\beta} b_{TB}^* \text{ and implicit differentiation yields:}
\]
\[
\frac{\partial \kappa_{MA}}{\partial x} = b_{VB}^* (3\beta (6\beta - 5)b_{VB}^* + 3(xM + C)) > 0. \text{ Comparative statics follow:}\]

\[
\frac{\partial V_{AB}}{\partial x} = \left( b_{VB}^* - 2(xM + C) \right) \frac{\partial b_{MA}}{\partial x} - b_{AB} \frac{\partial b_{MA}}{\partial x} - b_{VB}^* \left( b_{VB}^* + \beta \frac{\partial b_{MA}}{\partial x} \right) < 0 \text{ (using the fact that in an optimal allocation of resources, } b_{AB}^* = \frac{1}{2} b_{VB}^* \text{ and } \frac{\partial b_{MA}}{\partial x} = \frac{1}{2} (b_{VB}^* + \beta \frac{\partial b_{MA}}{\partial x}) \text{). (2)}\]

\[
\frac{\partial T_{BP}}{\partial x} = \Gamma X \frac{\partial \kappa_{MA}}{\partial x} > 0. \text{ (3)}
\]

**Nullance of Political Preferences: Substituting FOCS into the budget constraint and implicitly differentiating yields:**
\[
(1) \frac{\partial b_{**}}{\partial x} = \frac{b_{**} (b_{**} + 12C)}{3(xM - C(X - X)) + b_{**}} > 0 \text{ and } (2) \frac{\partial b_{**}}{\partial x} = \frac{b_{**} (b_{**} + 6C)}{3(xM - C(X - X)) + b_{**}} > 0 \text{. Comparative statics follow:} \]

\[
\frac{\partial V_{AB}}{\partial x} = \frac{b_{**} (b_{**} + 2C)}{2(xM + C) + b_{**} 2(\kappa X - C) + b_{**} 2} - k b_{**} \frac{\partial b_{**}}{\partial x} < 0 \text{ (using the fact that in an optimal allocation of resources, } \frac{\partial b_{**}}{\partial x} = \frac{1}{2} \frac{\partial b_{**}}{\partial x} \text{). (2)}\]

\[
\frac{\partial D_{BP}}{\partial x} = \frac{\gamma}{4\pi} \left[ 2k b_{**} \frac{\partial b_{**}}{\partial x} - b_{**} \right] \text{ is positive. (3)}\]

\[
\frac{\partial T_{BP}}{\partial x} = \Gamma \left[ X \frac{\partial b_{**}}{\partial x} > 0. \text{ (3)} \right]
\]

**Political Polarization:** Note that by the assumption of symmetric party platforms, $xM - C X = 2 xM$.

Substitute $b_{**} = \frac{1}{2} b_{**}$ from the FOCS into the budget constraint. Implicit differentiation yields:
\[
\frac{\partial b_{**}}{\partial x} = \frac{b_{**} (b_{**} + 12C)}{8(xM - C(X - X)) - b_{**}} > 0. \text{ Substitute } b_{**} = 2 b_{**} \text{ into the budget constraint. Implicit differentiation yields:}
\]

\[
(2) \frac{\partial b_{**}}{\partial x} = \frac{b_{**} (b_{**} + 6C)}{4(xM - C(X - X)) - b_{**}} > 0. \text{ Comparative statics then follow:} \]

\[
\frac{\partial V_{AB}}{\partial x} = \frac{b_{**} (b_{**} + 2C)}{2(xM + C) + b_{**} 2(\kappa X - C) + b_{**} 2} - k b_{**} \frac{\partial b_{**}}{\partial x} = \frac{b_{**} (b_{**} + 2C)}{2(xM + C) + b_{**} 2(\kappa X - C) + b_{**} 2} - k b_{**} \frac{\partial b_{**}}{\partial x} < 0 \text{ (where the last two terms of the first equation cancel after substituting } b_{**} = \frac{1}{2} b_{**} \text{ and } \frac{\partial b_{**}}{\partial x} = \frac{1}{2} \frac{\partial b_{**}}{\partial x} \text{). (2)}\]

\[
\frac{\partial T_{BP}}{\partial x} = \Gamma \left[ X \frac{\partial b_{**}}{\partial x} > 0. \text{ (3)} \right]
\]

\[
\frac{\partial D_{BP}}{\partial x} = \frac{\gamma}{4\pi} \left[ 2k b_{**} \frac{\partial b_{**}}{\partial x} - b_{**} \right] \text{ is positive. (3)}\]

**Machine Support:** Substituting FOCS into the budget constraint and implicitly differentiating yields:
\[
\frac{\partial b_{**}}{\partial x} = \frac{b_{**} (b_{**} + 12C)}{b_{**} (b_{**} + 6C)} > 0 \text{. Comparative statics follow: } \frac{\partial V_{AB}}{\partial x} = \frac{b_{**} (b_{**} + 2C)}{b_{**} (b_{**} + 2C)} > 0 \text{. (2)}\]

\[
\frac{\partial T_{BP}}{\partial x} = \Gamma \left[ b_{**} + (X + \bar{X}) \frac{\partial b_{**}}{\partial x} \right] = \Gamma b_{**} > 0. \text{ (3)}\]

\[
\frac{\partial T_{BP}}{\partial x} = \Gamma \left[ b_{**} + (X + \bar{X}) \frac{\partial b_{**}}{\partial x} \right] = \Gamma b_{**} > 0. \text{ (4)}\]

\[
\frac{\partial D_{BP}}{\partial x} = \frac{\gamma}{4\pi} \left[ b_{**} (4 + \frac{\partial b_{**}}{\partial x}) + (4(X + \bar{X}) + b_{**}) \frac{\partial b_{**}}{\partial x} \right] = -\Gamma b_{**} < 0.
\]