

# Value for Money? Community Targeting in Vote-Buying and Politician Accountability \*

Jessica Leight<sup>1</sup>, Dana Foarta<sup>2</sup>, Rohini Pande<sup>3</sup>, and Laura Ralston<sup>4</sup>

<sup>1</sup>American University

<sup>2</sup>Stanford University GSB

<sup>3</sup>Harvard University and NBER

<sup>4</sup>World Bank

December 19, 2017

## Abstract

Community targeting of vote payments — defined as the saturation of entire neighborhoods with cash prior to elections — is widespread in the developing world. In this paper, we utilize laboratory experiments conducted in the U.S. and Kenya to demonstrate that, relative to individual targeting, a vote-buying regime that distributes payments widely renders voters more tolerant of politician rent-seeking, and increases the level of politician rent-seeking observed in equilibrium. The most parsimonious model of preferences consistent with these patterns is a model in which both politicians and voters are characterized by multifaceted social preferences, encompassing reciprocity, altruism, and inequality aversion.

JEL code: D72

---

\*Thanks to the laboratory staff at the Harvard Decision Science Laboratory and the Busara Laboratory, particularly Nina Cohodes, Channing Jang, and James Vancel, for their assistance in data collection. Thanks to Vincenzo di Maro, Johannes Haushofer, Sarah Jacobson, Gautam Rao, and Tanya Rosenblat for detailed comments and seminar participants at Williams, the Barcelona Graduate School of Economics Summer Forum, the World Bank, USAID, the NBER Summer Institute, Berkeley - Haas, Yale, Swarthmore, Dartmouth, and Columbia University for useful feedback. We would also like to thank the funders that provided support for the project, the Harvard Weatherhead Center for International Affairs and USAID, through the Democracy Fellows and Grants Program implemented by IIE. This working paper was previously circulated under the titles “Value for money in purchasing votes: A lab experiment in the field” and “Value for money? Vote-buying and politician accountability in the laboratory”. Corresponding author: Jessica Leight, 4400 Massachusetts Avenue, Washington, D.C. 20016. leight@american.edu

# 1 Introduction

Vote-buying is widely characterized as a phenomenon in which party workers or brokers target specific individuals whose preferences are known to them *ex ante* (Finan and Schechter, 2012; Nichter, 2008; Stokes, 2005). However, community-level targeting — rather than individual-level targeting — is frequently observed in developing countries, as party workers saturate neighborhoods or rallies with cash or gifts prior to elections (Banerjee et al., 2011; Breeding, 2011). Clientelistic policies by incumbent politicians are often similarly structured, targeting broad existing patron-client networks defined by region, kinship, or ethnicity (Keefer and Vlaicu, 2008; Robinson and Verdier, 2013).

Politicians who target individual voters benefit from both enhanced information and enhanced capacity for enforcement; the prevalence of community-level targeting is thus somewhat puzzling. Our objective in this paper is to develop a behavioral model of voters' preferences that is consistent with this puzzle, and use laboratory experiments to provide corroborating evidence. The model assumes that politicians seek to maximize their expropriation of rents while winning reelection, and voters use their votes to discipline politician's rent-seeking. In addition, it builds on two stylized empirical facts. First, social preferences are highly salient in low-income communities (Cardenas and Carpenter, 2008); while reciprocity has been identified as relevant for sustaining vote-buying, we also analyze the complementary role of altruism and inequality aversion (Charness and Haruvy, 2002). Second, both vote-buying and clientelism are generally public phenomena, encompassing large networks of voters who possess high-quality information about the available transfers (Anderson et al., 2015; Vicente, 2014; Kramon, 2011).

We demonstrate that the interaction of multifaceted social preferences and widespread information about vote-buying generates an environment in which voters are differentially more responsive to collectively-targeted payments, rather than individually-targeted payments. Multifaceted social preferences thus have the perverse effect of augmenting voters' response to vote-buying. Accordingly, a politician who seeks to maximize expropriation while holding constant his probability of reelection will favor community targeting as a means to reduce accountability.

We then utilize a series of laboratory experiments conducted in the U.S. and Kenya to identify whether the voter response to individual versus community targeting of vote payments is consistent with our theoretical predictions. We implement a retrospective voting game in which subjects choose whether to reelect an incumbent who expropriates rents from a common treasury. The reelection choice serves as a tool to punish politicians for excessive expropriation, and voting is secret and costless. No other dimension of politician quality influences voters' earnings, and there is no identified alternative candidate; hence, voters face no selection motive. We augment this game by introducing vote payments as an external transfer to the voter, distributed to a certain fraction of voters while maintaining the secret ballot. The politician has no agency in the targeting of payments, and does not pay transfers out of her own endowment.

Our primary objective is to examine whether the introduction of vote payments alters subjects' willingness to punish the politician for expropriation by voting against his reelection, and how this response varies with the proportion of the polity that is targeted for vote payments.

Moreover, we generate predictions for purely self-interested subjects, as well as subjects motivated by different combinations of social preferences. We then compare these predictions to the observed empirical patterns.

First, we analyze voters' response to the introduction of payments. While theory suggests that self-interested voters will show no response, all models of preferences that include reciprocity predict that subjects who receive a payment increase their reelection threshold relative to the baseline game in which no payments are distributed. Predictions about the response of voters who do not receive payments — but are aware of them — vary. If subjects are motivated purely by self-interest and reciprocity, individuals who do not receive payments do not shift their reelection thresholds. However, if subjects are motivated in part by altruism, these individuals respond by punishing the politician, decreasing their threshold.<sup>1</sup>

Our empirical results suggest that, consistent with reciprocity, subjects who receive a payment increase the maximum threshold of expropriation at which they will reelect the politician — i.e., they treat the politician more leniently. By contrast, subjects who do not receive payments treat the politician more harshly. This result is inconsistent with a model where voters are only motivated by self-interest and reciprocity, and suggests that altruism is relevant. However, this pattern does not allow us to draw any conclusions as to the importance of inequality aversion.

Second, we seek to analyze whether community targeting is differentially more effective than individual targeting, utilizing variation in the number of payments distributed within the experiment. Games in which more payments are distributed, and particularly games in which all voters receive payments, are analyzed as the experimental analogue to community targeting.

Our model predicts that if reciprocity and altruism are the only relevant dimensions of social preferences, all voters become more willing to punish the politician as the number of payments increases. If voters are also motivated in part by inequality aversion, increasing the number of payments generates divergent responses: voters who receive payments become less willing to punish the politician (allowing him to expropriate more), while those who do not receive payments become more willing to punish. Intuitively, a wider distribution of payments narrows the gap between the politician's payoff and voters' payoffs in expectation, reducing the utility cost for payment recipients of allowing the politician to expropriate more.

Here, empirical evidence suggests that the effect of each payment is larger when more payments are distributed, rendering payments most effective when they are distributed to all subjects. In fact, when all voters receive a payment, the effect per payment on each voter's threshold is around 90% larger relative to an identical game in which all but one (four out of five) voters receive a payment.<sup>2</sup> At the same time, as voters become less willing to punish the politician, the politician chooses to expropriate more, suggesting there is a rent-seeking cost to vote-buying.

---

<sup>1</sup>The intuition underlying this pattern is that if subjects are not motivated at least in part by altruism, they will uniformly opt for the minimum sustainable reelection threshold in equilibrium, and thus have no scope to punish the politician further. If subjects are partly motivated by altruism and thus sensitive to the politician's payoff, however, they choose a higher threshold in the base equilibrium, and respond to payment non-receipt by punishing the politician.

<sup>2</sup>As evidence of the role of altruism, we observe that voters who do not receive payments always allow a non-zero level of expropriation, but the backlash effect among the excluded voters becomes larger in magnitude as the number of payments increases. Needless to say, there is no backlash effect when all subjects receive payments.

The observed voter response to payments, as well as the increase in the magnitude of this response when the number of payments increases, suggests that the most parsimonious model of subject preferences consistent with the observed pattern encompasses self-interest as well as reciprocity, altruism toward the politician and fellow voters, and aversion to inequality between the politician and voters. Conditional on this model of preferences, the experimental results suggest that community targeting of vote payments is differentially more effective than individual targeting of such payments, ultimately allowing the incumbent politician to expropriate more resources without facing electoral punishment.

Importantly, the effectiveness of large-scale community-targeted vote-buying is evident even in an environment characterized by full information around vote payments. This highlights that increasing transparency may not be sufficient in and of itself to reduce the effectiveness of vote buying. In addition, our findings hold for both the U.S. and Kenya sample, but are significantly stronger for the Kenya subsample. While there are several potential reasons for the observed country-level differences, the findings are consistent with the fact that measured social preferences are stronger in Kenya.

This paper contributes to several related literatures. We add to the growing literature in behavioral political economy by examining the link between social preferences and voter responses to vote-buying; DellaVigna (2009) and Schnellenbach and Schubert (2015) provide useful reviews. In analyzing this nexus, our findings also complement Finan and Schechter (2012), who find that more reciprocal individuals are targeted for vote-buying in Paraguay. Here, we suggest that other dimensions of social preferences may be relevant, and if they are, voters may in fact respond more robustly to community targeted vote payments.

Our analysis also demonstrates how vote-buying can negatively affect governance outcomes. More specifically, we identify a new channel for this adverse relationship: vote-buying increases voters' tolerance of rent-seeking, even in the absence of any effect on selection. A number of recent papers have indirectly documented that vote-buying can alter voters' selection of candidates by presenting evidence that interventions targeting vote-buying not only reduce its reported prevalence, but yield shifts in voting patterns.<sup>3</sup> However, to the best of our knowledge, we are the first to provide causal evidence on the link between vote-buying and voters' willingness to punish politicians in the absence of any selection motive. By doing so, we identify a mechanism that may underlie the common observation that voters who have received payments no longer exert effective control over policy decisions (Kitschelt, 2000; Stokes, 2007).<sup>4</sup>

---

<sup>3</sup>Vicente (2014) demonstrates that an anti-vote buying campaign in Sao Tome and Principe reduces the challenger's vote share, and argues that this reflects the fact that vote-buying is the challenger's preferred response to the incumbent's use of clientelistic policies. Hicken et al. (2014) report on a campaign in the Philippines that sought to reduce voters' temptation to sell their votes, and demonstrate that it significantly reduced vote-switching from the candidate ex ante preferred by the voter. In another related paper, Cruz et al. (2015) analyze the effect of providing information about the incumbent's performance to voters in the Philippines, and find these voters are subsequently targeted more for vote-buying.

<sup>4</sup>In addition, a theoretical literature has analyzed the implications of vote-buying, focusing primarily on the capture of legislators or committee members (Bo, 2007; Dekel et al., 2008; Groseclose and Snyder, 1996; Snyder, 1991). These papers generally conclude that vote-buying leads to inefficient outcomes, though Dekel et al. (2008) shows efficient outcomes are possible if parties place valuations on votes that aggregate the values placed by their supporters.

We also contribute to a growing literature in experimental economics that analyzes varied forms of reciprocity. Similar to Abbink et al. (2002) and Malmendier and Schmidt (2011), we find that subjects display a reciprocal response when receiving a gift, even if this response is at the expense of third parties, and even though the gift is transparently provided in order to influence their behavior. Other recent work consistent with our findings includes Pan and Xiao (2014), who report that recipients favor a gift giver over a third party even when the third party has incurred the same cost and signaled the same intention of giving, and Strassmair (2009), who presents evidence that recipients' response to a gift does not significantly vary given experimental variation in the extent to which the gift may arise from selfish motives by the giver. Our experimental results suggest that subjects respond robustly to a transfer regardless of whether any *quid pro quo* is specified, and even though that response is costly both to the recipient of the transfer and to other subjects.

Finally, our findings increase the common ground shared between the literatures on vote-buying and clientelism. Recent papers argue that clientelistic relationships undermine electoral accountability by enabling the elite to easily win the votes of poor citizens and subsequently engage in rent-seeking behavior (Baland and Robinson, 2008; Anderson et al., 2015). One interesting finding in this literature highlights a strong positive correlation between social capital and elite capture of policy-making (Acemoglu et al., 2014). Our paper suggests that this may reflect the fact that clientelistic relationships are also in part sustained by social preferences.

The remainder of the paper proceeds as follows: Section 2 provides empirical context about social preferences, vote-buying and clientelism in the developing world, while Section 3 presents the model. Section 4 outlines the experimental methods, and Section 5 summarizes the empirical analysis. Section 6 concludes.

## 2 Empirical context

As previously noted, our conceptual framework seeks to build on two stylized facts about political behavior and institutions in the developing world. The first is that multifaceted social preferences are salient; the second is that vote-buying and clientelism are widespread, and often conducted in public. We will provide additional evidence on each of these points.

### 2.1 Social preferences

In recent years, the role of social preferences in shaping economic and governance outcomes in the developing world has received increasing attention in the literature. Broadly speaking, this behavioral development literature has focused on two questions: whether social preferences or propensity to cooperate may be different in developing country contexts or contexts characterized by weaker formal institutions, and whether individual preferences toward risk and time may be different. Here, we will focus primarily on the first point.

Cardenas and Carpenter (2008) provide a valuable overview of this literature. The authors highlight that while patterns are not fully uniform, in general cooperation rates in prisoner's

dilemma or public goods games are higher and more sustained among poor participants in Africa and Southeast Asia. Patterns for trust are more ambiguous. The authors also note that in developing countries, behavior in the dictator game and ultimatum game (used to capture altruism and inequality aversion, respectively) are more driven by norms rather than strategic advantage. They argue that in general, societies in which formal institutions are weak may rely more heavily on social norms and preferences than societies with stronger institutions.

In additional related work, Cardenas (2003) shows that increased wealth within rural Colombian village populations reduces cooperation in experimental games, suggesting that some pro-social behaviors could be more salient in lower-income contexts. Greig and Bohnet (2008) find that respondents in a Nairobi slum exhibit balanced reciprocity, in which there are quid-pro-quo returns for any level of trust, and Carter and Castillo (2009) find that respondents in a South African slum exhibit high degrees of both trustworthiness and altruism, but the latter shows more robust correlations with living standards. By contrast, small-scale societies with very low levels of market integration generally show low levels of experimentally measured cooperation (Henrich et al., 2001).

We are also able to examine evidence of social preferences among our own experimental subjects. Between 2013 and 2015, we conducted experiments at the Harvard Decision Science Lab in Cambridge, MA and the Busara Experimental Laboratory in Nairobi, Kenya. Our sample in the experimental sessions includes 450 subjects from the U.S. and 355 from Kenya, characterized by an average age of 33. In the U.S., the subject pool is equally divided by gender, overwhelmingly unmarried, and highly educated. In Kenya, the subject pool is 65% female and has an average of eleven years of education; half are married. Levels of political engagement are high in both subject pools, though higher in Kenya: 72% of U.S. subjects report voting in the last presidential election, while 86% of Kenyan subjects did so. Table E3 in the on-line Appendix provides details.

We collected detailed experimental measures of social preferences from our subjects, reported in Panel A of Table 1. As will be described in more detail in Section 4, the social preference games were conducted first in each experimental session, prior to the introduction of any voting games or any language around voting. Each subject was engaged in the dictator, trust, and ultimatum games, for which detailed protocols are provided in on-line Appendix C.<sup>5</sup>

We find that 66% of U.S. subjects send a positive amount to a partner in the dictator game, compared to 81% of Kenyan subjects. U.S. subjects are more likely to send a positive amount in the trust game, but conditional on receiving a positive amount, Kenyan subjects are more likely to return a non-zero amount. Kenyan subjects also exhibit greater inequality aversion; at 5.72 out of a maximum of \$10, the minimum transfer that Kenyans would accept from a partner in the ultimatum game is roughly double the reported threshold for U.S. subjects (\$2.91). (While the real endowment assigned to subjects was lower in the sessions conducted in Kenya, subjects'

---

<sup>5</sup>The sample includes 653 subjects (372 in the U.S. and 281 in Kenya); this includes all subjects other than those included in session type F, unequal endowments, for whom social preferences are not observed. In the U.S., these choices were not incentivized, and thus subjects were not paired with a partner in order to calculate a payoff. In Kenya, these choices were incentivized, and subjects were paired with a partner and informed of their payoff. This payoff was added to their earnings in the voting game.

choices are normalized relative to the endowment in the U.S. sessions.) These differences are all significant at the one percent level. This would suggest that the role of social preferences in shaping political behavior is likely stronger in Kenya.<sup>6</sup>

Thus in general, experimentally generated measures suggest that in our sample, multiple dimensions of social preferences are highly relevant. This evidence is consistent with recent literature suggesting that in gift-exchange games, intentional reciprocity, distributive concerns, and altruistic considerations are all important in shaping subjects' choices (Charness and Haruvy, 2002); Fehr and Schmidt (2007) also provide a useful overview. In addition, experimentally measured rates of altruism, reciprocity, and inequality aversion are all higher in Kenya, consistent with the previous evidence that social preferences may be more salient in developing countries or contexts with weaker formal institutions.

## 2.2 Transactional politics in the developing world

Broadly speaking, two forms of vote-buying have been identified in the literature. One important manifestation, particularly in Latin America, is targeted transfers in which political brokers interact directly and repeatedly with individuals they know well. This is, for example, the form of vote-buying analyzed by Finan and Schechter (2012), employing data from Paraguay, and by Stokes (2005) and Nichter (2008), employing data from Argentina.

A second common form of vote-buying is widespread saturation of a neighborhood or community with cash or gifts, without any particular targeting or enforcement. Gift-giving at election rallies is a classic example, as described in Kramon (2011), who provides evidence about this form of vote-buying in Kenya. In his survey of 655 individuals, nearly half reported receipt of cash prior to the 2007 presidential election. Of those, 57% reported receiving the money at a rally and 16% at the market, settings where the presumed degree of targeting is low. Nearly 90% of respondents reported they did not believe either the person who provided the payment or anyone connected to a political party could ascertain their true vote. In Tanzania, *takrima* or traditional hospitality for citizens prior to elections was officially allowed until 2006, but according to surveys still persists (Croke, 2017).

Similarly, observers in India reported significant vote-buying in state elections in Delhi in 2008 and Bihar in 2010. In both cases, gifts including cash, alcohol, and food were distributed to all households in targeted neighborhoods on the night before the election. The distribution was managed by youth from the community who, while familiar to the recipients, do not have strong social ties to them (Banerjee et al., 2011). Breeding (2011) also reports that in India, parties often target vote payments to whole communities, rather than individuals.

In 2014, the authors administered a brief exit survey to 111 subjects included in experimental sessions in Nairobi. 46% of the subjects reported that they had received cash or gifts from a

---

<sup>6</sup>We construct an additional index of reciprocity  $Rec_i$ , defined as  $Perc_i^{high} - Perc_i^{low}$ , censored at zero; where  $Perc_i^{high}$  ( $Perc_i^{low}$ ) is the percentage of funds received that a subject would return to sender in the trust game if he received more than 50% of endowment (less than 50%). In the 2013 sessions and in Kenya, a simpler trust game was employed in which the sender has the choice only to send all or nothing; accordingly,  $Rec_i$  can be constructed only for the 2014 U.S. sessions. The mean index of reciprocity is .06. Interestingly, this is extremely close to the average level (.04) reported by Finan and Schechter (2012) for their Paraguay sample.

politician or a politician’s representative in the last presidential election (in 2013); more broadly, they estimated that two thirds of Kenyans received such a gift or transfer. Out of those who reported receiving a transfer, 80% said the individual who provided it was previously known to them, but only 20% stated that they interacted again with this individual after the transfer exchange.

In 2015, we also surveyed 400 households in rural Bangladesh about their vote-buying experiences.<sup>7</sup> Around 30% of respondents reported payment in cash or in kind in the last election. However, in this context, 25% of respondents reported they had rarely interacted with the agent who offered the payment prior to receiving it, and 55% reported they rarely interacted with the person after the payment. Both sources of evidence seem consistent with limited targeting and limited enforcement.

It is also useful to note that the literature on clientelism similarly highlights that clientelistic benefits are generally provided to broad networks of beneficiary clients, with the objective of providing a credible signal of commitment from the politician (Keefer and Vlaicu, 2008; Robinson and Verdier, 2013). These networks can be defined by community boundaries; by caste or other markers of social status; or by ethnicity (Anderson et al., 2015; Burgess et al., 2015; Fujiwara and Wantchekon, 2013). Generally, analysts do not seek to systematically estimate what percentage of a given community or constituency directly benefits from clientelistic policies, and in some cases, this may be impossible if local public goods are provided. However, the assumption is that all members of a certain network are at least presumptively able to access the clientelistic benefit, and are jointly more likely to cast their votes for the politician in return. Individual-level targeting is accordingly rare.

### 3 Theoretical framework

We begin by presenting a simple conceptual framework to inform our laboratory experiments. Our objective is to analyze how subjects acting as voters and politicians make choices in a simple voting game of retrospective accountability, conditional on different formulations of preferences.

In understanding subjects’ behavior as voters, we focus on three primary dimensions: the response of voters who receive vote payments, the response of voters who do not receive vote payments but are aware of payments, and the shift in both responses when the number of payments distributed increases (an experimental proxy for community targeting). In understanding subjects’ behavior as politicians, we focus on rent-seeking.

Consider a setting with one politician, denoted  $p$ , and  $N \geq 1$  ex-ante identical voters. Each voter  $v$  receives an initial endowment  $y_v = y$ , and the politician receives a salary  $y_p = y$  (i.e., the voter and politicians’ endowments are identical). Each voter’s endowment is taxed at a rate  $\tau$ , and the tax revenue  $T = \tau Ny$  is pooled in a common treasury. The politician can expropriate from the treasury an amount up to  $\lambda \cdot T$ , where  $\lambda \in (0, 1)$ , i.e. some fraction of the tax revenue is protected from expropriation. The politician chooses the amount  $\lambda_p \cdot T \leq \lambda \cdot T$  to expropriate.

---

<sup>7</sup>This survey was jointly conducted by Leight and Pande, and has not yet been published.



Each voter  $v$  chooses an expropriation threshold  $\lambda_v \cdot T$  that summarizes his choice of whether or not to reelect the politician. The voter votes in favor of the politician's reelection if, and only if, the politician expropriates an amount less than or equal to this threshold. If the majority of voters vote to reelect the politician (denoted  $\rho = 0$ ), the politician retains both his full salary and the amount he expropriated; if the majority of voters vote against the politician's reelection (denoted  $\rho = 1$ ), the politician pays a penalty of  $0.5 \cdot y + \epsilon$ , while retaining any expropriated revenue. (Note that  $\rho$  is accordingly a dummy variable for the politician's removal, rather than his reelection.) The payoff for the politician can thus be summarized by:

$$E_p = 0.5 \cdot y + \lambda_p \cdot T + (1 - \rho) \cdot (0.5 \cdot y + \epsilon). \quad (1)$$

Regardless of the reelection outcome, each voter's payoff is constituted by the untaxed portion of his endowment  $(1 - \tau) \cdot y$ , as well as an equal share of the resources remaining in the treasury following expropriation,  $(1 - \lambda_p) \cdot T/N$ . If the politician is not reelected, each voter also pays a transition fee  $\kappa \cdot y$ . The monetary payoff for each voter  $v$  is summarized by:

$$E_v = (1 - \tau) \cdot y + \frac{(1 - \lambda_p) \cdot T}{N} - \rho \cdot \kappa \cdot y, \quad (2)$$

Vote payments are introduced as follows. A subset  $n \leq N$  voters each receive a vote payment  $p$ ; the experimenter, not the politician, chooses who receives the payment, and vote payments are funded separately (i.e., not drawn from the voters' or the politician's endowment). In the base game, the payments are described simply as "a payment in exchange for your vote". Therefore, the payoff for a voter  $v$  who receives a payment is  $E_v + p$ . In addition, in the base game, all voters are aware of  $n$  and the size of the payment  $p$ .

The full game can be summarized as follows:

1. Vote payments are made to  $n$  voters.
2. Each voter  $v$  chooses a threshold  $\lambda_v \cdot T$  corresponding to the maximum level of expropriation he is willing to tolerate, and the politician chooses an amount  $\lambda_p \cdot T$  to expropriate, where  $\lambda_p \leq \lambda$ .
3. Given an expropriation level  $\lambda_p \cdot T$ , if a majority of voters vote to reelect the politician ( $\rho = 0$ ), he retains his full salary. If a majority of voters do not vote to reelect the politician, the politician is removed ( $\rho = 1$ ) and pays the associated penalty, while voters incur the transition fee  $\kappa \cdot y$ .
4. Payoffs are realized.

The analysis of this game and the characterization of the set of pure strategy Nash equilibria is presented in Appendix A.1. In particular, we demonstrate that any expropriation level above a threshold  $\lambda^* \cdot T$  can be supported in a pure strategy Nash equilibrium. Here, we focus on the predictions for the pure strategy equilibrium with sincere voting, in which each voter chooses the reelection threshold that maximizes his expected utility, assuming that he is pivotal.

### 3.1 Self-interest

Consider first the case in which subjects are purely self-interested and the utility of each subject  $i$  is an increasing function of his payoff alone:  $u_i = E_i$ . Throughout, we assume that subjects' preferences are identical for voters and politicians.

**Prediction 1** *Given self-interested preferences,*

1. *A voter's threshold choice is unaffected by the introduction of payments.*
2. *Introducing payments or altering the number of payments does not change the equilibrium expropriation by the politician.*

**Proof.** In Appendix A.2. ■

If individuals derive utility from their own payoffs, each voter optimally chooses the minimum sustainable reelection threshold – the value at which the politician is indifferent between winning reelection and deviating to the maximum level of expropriation. Since this threshold is a function only of the politician's payoff, payments to voters do not shift the threshold.

### 3.2 Self-interest and social preferences

Next, we consider the case in which subjects are characterized by both self-interest and social preferences, and are thus sensitive to the payoffs received by other subjects. We consider three common dimensions of social preferences: intention-based reciprocity as in Rabin (1993) and Dufwenberg and Kirchsteiger (2004), altruism as in Andreoni and Miller (2002), and inequality aversion as in Bolton and Ockenfels (2000), applied to the difference between the politician's payoff and the average voter payoff.

Broadly speaking, reciprocity leads subjects to derive utility from being kind to others when others are kind to them. Given that the voter is informed that he is receiving a payment in exchange for his vote, we assume a reciprocal individual is motivated to respond kindly towards the politician. Altruism renders subjects sensitive to the other subjects' payoffs, and inequality aversion leads subjects to derive disutility when there is a difference between the politician's payoff and the average payoff of voters.<sup>8</sup>

Given these definitions, each subject's utility can be described as follows:

$$U_i = E_i + \gamma f((\lambda_i T - \lambda^e T)(p_i - p^e)) + \eta m \left( \sum_{j \neq i} E_j \right) - \alpha \cdot h \left( \left| E_p - \frac{1}{N} \sum_j E_j \right| \right)$$

The function  $f(\cdot)$  is weakly concave and increasing, with  $f(0) = 0$  and  $\gamma \in [0, 1]$ . The measure  $(\lambda_v - \lambda^e) \cdot T$  captures how kind subject  $i$  is to the politician, and measure  $(p_i - p^e)$  captures

<sup>8</sup>We can also explore analyzing this case using two other common formulations of inequality aversion. One is inequality aversion as modeled in Fehr and Schmidt (1999); the other is a more general formulation of Bolton-Ockenfels preferences in which subjects derive disutility from any difference between their own payoffs and the average payoff. While analyzing the former case of Fehr-Schmidt preferences yields similar results, the latter formulation of preferences yields multiple equilibria.

how kindly subject  $i$  believes he is treated. The value  $\lambda^e \cdot T$  denotes the equitable equilibrium expropriation, defined as the average expropriation threshold on the Pareto frontier.<sup>9</sup> The value  $p^e$  denotes the equitable payment expected by the subject, defined as the expected value of the payment given  $n$  payments and  $N$  voters:  $p^e \equiv n/N \cdot p$ . In addition, we assume that  $-\frac{f''(x)x}{f'(x)} < 1$ . Intuitively, this suggests that  $(\lambda_i - \lambda^e) \cdot T$  and  $(p_i - p^e)$  are complements – the utility value of reciprocal behavior is higher when there is more reciprocal behavior from the other subject.

The increasing and concave function  $m(\cdot)$  captures the altruism effect, with  $\eta \in [0, 1]$  measuring the weight placed on altruism in the individual's preferences. Finally,  $h(\cdot)$  is an increasing and convex function capturing inequality aversion, with  $\alpha \in [0, 1]$ .<sup>10</sup>

We now consider cases in which the subjects' preferences exhibit different combinations of the above social preferences, in addition to a consistent self-interested preference for greater own-earnings. Specifically, we consider preferences that exhibit only reciprocity ( $\gamma > 0; \eta, \alpha = 0$ ); preferences that exhibit reciprocity and altruism ( $\gamma, \eta > 0; \alpha = 0$ ); preferences that exhibit reciprocity and inequality aversion ( $\gamma, \alpha > 0; \eta = 0$ ); and preferences that exhibit reciprocity, altruism and inequality aversion ( $\gamma, \eta, \alpha > 0$ ).

### 3.2.1 Self-interest and reciprocity

We first consider the case in which reciprocity is the only relevant dimension of social preferences, given that this has previously been the primary focus of the vote-buying literature.

**Prediction 2** *Given preferences characterized by self-interest and reciprocity,*

1. *A voter who receives a payment chooses a higher threshold  $\lambda_v$  than a voter who does not receive a payment.*
  - (a) *A voter who receives a payment increases his selected threshold  $\lambda_v$  relative to the base case of no payments.*
  - (b) *A voter who does not receive a payment does not shift his selected threshold  $\lambda_v$  relative to the base case of no payments.*
2. *As the number of payments  $n$  increases, a voter who receives a payment decreases his choice of  $\lambda_v$ .*

**Proof.** In Appendix A.3. ■

Consider first a voter who receives a payment. If preferences exhibit reciprocity, the voter responds by allowing the politician to expropriate more. However, if the number of payments increases, then the expected value of the equitable payment  $g^e$  increases, reducing the reciprocal

<sup>9</sup>It is possible to solve for and specify algebraically the equitable expropriation level; however, the precise specification of these levels will not prove to be relevant for our subsequent analysis, given the assumed shape of the reciprocity function  $f(\cdot)$ .

<sup>10</sup>For concision, we will subsequently refer to this postulated form of politician-voter group inequality aversion simply as inequality aversion.

response. By contrast, voters who do not receive payments are already optimally choosing the lowest sustainable threshold level of expropriation for the politician. Accordingly, they cannot decrease this threshold in response to their failure to receive a vote payment.

### 3.2.2 Self-interest, reciprocity, and altruism

Next, we consider the case in which social preferences encompass reciprocity and altruism.

**Prediction 3** *Given preferences characterized by self-interest, reciprocity, and altruism,*

1. *A voter who receives a payment chooses a higher threshold  $\lambda_v$  than a voter who does not receive a payment.*
  - (a) *A voter who receives a payment increases his selected threshold relative to the base case of no payments.*
  - (b) *A voter who does not receive a payment decreases his selected threshold relative to the base case of no payments, if he exhibits sufficiently high altruism ( $m'(\cdot)$  is sufficiently high); otherwise, he does not shift his selected threshold.*
2. *If the number of payments  $n$  increases and subjects exhibit sufficiently strong altruism, ( $m'(\cdot)$  is sufficiently high), all voters decrease their choice of  $\lambda_v$  compared to the  $n = 1$  case. This includes voters who did and did not receive payments. If subjects exhibit weak altruism ( $m'(\cdot)$  is low), then voters who receive a payment reduce their choice of threshold, while voters who do not receive a payment do not change their choice of threshold.*

**Proof.** In Appendix A.4. ■

Again, the intuition for the reciprocal response is consistent. Importantly, however, when subjects are altruistic, the voter does not choose the minimum sustainable reelection threshold for the politician in the baseline game.<sup>11</sup> Accordingly, subjects who do not receive payments respond to their exclusion (or more specifically, to their failure to receive the equitable payment) by punishing the politician, lowering the reelection threshold.

An increase in the number of payments increases average income in the community, reducing the marginal benefit of altruistically allowing the politician to expropriate more. Hence, for voters who receive payments, both a reduced reciprocal response and considerations of altruism lead to a decrease in the choice of  $\lambda_v$  as  $n$  increases. Similarly, for the voter who does not receive a payment, the negative reciprocal response becomes larger in magnitude as the number of payments increases, given that the voter expects a higher equitable payment. If the voter exhibits sufficiently high altruism, then his choice of threshold when only one payment is offered is above the minimum sustainable threshold, and the negative reciprocal response decreases this threshold; however, if the voter exhibits low altruism, then he chooses the minimum sustainable threshold in the one-payment game, and cannot lower this threshold any further.

---

<sup>11</sup>More technically, this conclusion holds conditional on the assumption that subjects receive strong utility benefits from altruism: i.e.,  $\eta m'(\cdot)$  is sufficiently high.

### 3.2.3 Self-interest, reciprocity, and inequality aversion

Now assume social preferences encompass exhibit reciprocity and inequality aversion.

**Prediction 4** *Given preferences characterized by self-interest, reciprocity, and inequality aversion,*

1. *A voter who receives a payment chooses a higher threshold  $\lambda_v$  than a voter who does not receive a payment.*
  - (a) *A voter who receives a payment increases his selected threshold  $\lambda_v$  relative to the base case of no payments.*
  - (b) *A voter who does not receive a payment does not shift his selected threshold  $\lambda_v$  relative to the base case of no payments.*
2. *As the number of payments  $n$  increases,*
  - (a) *A voter who receives a payment decreases his choice of  $\lambda_v$  if the marginal cost of inequality aversion increases sufficiently slowly, and increases his choice of  $\lambda_v$  otherwise.*
  - (b) *A voter who does not receive a payment increases his choice of  $\lambda_v$ .*

**Proof.** In Appendix A.5. ■

The intuition for the reciprocal response is the same as described above. If subjects are also averse to inequality, the provision of vote payments decreases the level of inequality between the voters in aggregate and the politician, lowering the marginal cost to the voter of allowing expropriation. Given that the politician is also inequality averse, his utility cost of engaging in expropriation likewise decreases. Jointly, these effects yield an increase in  $\lambda_i$ .

We now consider the effect of an increase in the number of payments. For the voter who receives a payment, the postulated effects are of opposite sign: reciprocal preferences suggest that  $\lambda_i$  should be decreasing in  $n$ , while inequality averse preferences suggest that  $\lambda_i$  should be increasing in  $n$ . The latter effect dominates if the voter is sufficiently averse to inequality. For the voter who does not receive a payment, both reciprocity and inequality aversion lead him to choose the minimum sustainable threshold  $\lambda^*$ , and this threshold is increasing in  $n$ .

### 3.2.4 Self-interest, reciprocity, altruism, and inequality aversion

Finally, we consider the case in which social preferences encompass reciprocity, altruism and inequality aversion.

**Prediction 5** *Given preferences characterized by self-interest, reciprocity, altruism, and inequality aversion,*

1. *A voter who receives a payment chooses a higher threshold  $\lambda_v$  than a voter who does not receive a payment.*

- (a) *A voter who receives a payment increases his selected threshold relative to the base case of no payments.*
  - (b) *A voter who does not receive a payment decreases his selected threshold relative to the base case of no payments.*
2. *If the number of payments  $n$  increases, a voter who receives a payment increases his choice of  $\lambda_v$  if the marginal cost of inequality aversion is increasing sufficiently fast, and decreases his choice of  $\lambda_v$  otherwise.*
  3. *If the number of payments  $n$  increases, a voter who does not receive a payment decreases his choice of  $\lambda_v$  if the marginal benefit of altruism is increasing sufficiently fast, and he increases his choice of  $\lambda_v$  otherwise.*
  4. *There exist concave functions  $f(\cdot)$ ,  $m(\cdot)$  and convex functions  $h(\cdot)$  such that, when the number of payments increases, the threshold  $\lambda_v$  increases for the voter who receives a payment, and it decreases for the voter who does not receive a payment.*

**Proof.** In Appendix A.6. ■

The dynamics described in Prediction 4 continue to play out. Given sufficiently strong altruism, however, a voter who does not receive a payment also prefers an expropriation threshold above the minimum sustainable level. Accordingly, he will adjust his threshold in response to a shift in the number of payments. Due to the negative reciprocal response and the cost of inequality aversion, his threshold decreases as the number of payments increases.

### 3.2.5 Analyzing the politician's choices

The politician's preferences are assumed to be identical in structure to the voters' preferences, and in any equilibrium in the voting game, the politician sets  $\lambda_p$  equal to  $\lambda_v$  as chosen by a majority of voters. Therefore, the politician's choices in equilibrium can be described as follows.

**Prediction 6** *The politician's choice of expropriation in equilibrium can be described as follows.*

1. *Given preferences that are purely self-interested, the politician's level of expropriation will not shift when payments are introduced.*
2. *Given preferences characterized by self-interest, reciprocity, and potentially inequality aversion, but not by altruism:*
  - (a) *If a minority of subjects receive payments, the politician's level of expropriation will be unchanged.*
  - (b) *If a majority of subjects receive payments, the politician's level of expropriation will increase.*
3. *Given preferences characterized by self-interest, reciprocity, and altruism, and potentially inequality aversion:*

- (a) *If a minority of subjects receive payments, the politician's level of expropriation will decrease.*
- (b) *If a majority of subjects receive payments, the politician's level of expropriation will increase.*
- (c) *Given an increase in the number of payments conditional on a majority receiving payments, the politician's response will shift in the same direction as the voters' reelection thresholds.*

### 3.2.6 Community targeting versus individual targeting

We conclude this analysis by highlighting how social preferences can influence a politician's choice of how to target vote payments, assuming that he seeks to maximize expropriation while still winning reelection.

**Prediction 7** *Assume voters have preferences characterized by self-interest as well as reciprocity, altruism, and inequality aversion, and the politician has a fixed vote-buying budget. If altruistic preferences are sufficiently strong (the value of  $\eta \cdot m'(\cdot)$  is sufficiently large), then the politician maximizes expropriation conditional on reelection by providing payments to all voters (community targeting), rather than individual-level targeting of particular voters.*

**Proof.** In Appendix A.7. ■

### 3.3 Comparative statics

We can also derive comparative statics with respect to two key parameters: the strength of the reciprocal response, captured by  $\gamma$ , and the fraction of the treasury that is vulnerable to expropriation,  $\lambda$ .

**Prediction 8** *An increase in  $\gamma$  (weakly) increases  $\lambda_v$  for voters who receive payments and (weakly) decreases  $\lambda_v$  for voters who do not receive payments.*

**Proof.** In Appendix A.8. ■

Intuitively, individuals who derive more utility from a reciprocal response are even more willing to reward a politician who distributes vote payments. Conversely, more reciprocal individuals who do not receive a payment are more willing to punish the politician, if they are not already constrained by an initial choice of the minimum sustainable threshold.

**Prediction 9** *An increase in  $\lambda$  weakly increases  $\lambda_v$  for all voters.*

**Proof.** In Appendix A.9. ■

A higher  $\lambda$  increases the minimum sustainable threshold for politician reelection in a pure strategy equilibrium. When the politician can expropriate more, this increases his outside option, rendering it more challenging for voters to discipline him with the threat of removal. Thus if voters prefer the minimum sustainable reelection threshold, their choices shift accordingly.

If the voters' preferred threshold(s) are above the minimum sustainable threshold ex ante – because of altruism or the reciprocal response to a payment – then a shift in  $\lambda$  does not impact the choice of these voters, unless their preferred choice(s) drops below the (new) minimum sustainable threshold once  $\lambda$  increases. In the latter case, again the voters' reelection thresholds will increase, and will equal the (new) minimum sustainable threshold given higher  $\lambda$ .

### 3.4 Unequal endowments

In our laboratory experiments, we also seek to evaluate whether subjects respond differently to an increase in endowment as opposed to a labeled vote payment, and we can use the theoretical framework to generate predictions for how these two cases should differ. Consider the case where, rather than receiving payments, voters receive different endowments at the initiation of the game that incorporate the value of the payments. Specifically,  $n$  voters have an endowment equal to  $y + p$ , and the remaining voters have endowment  $y$ ; they are then engaged in the simple baseline voting game, without payments.

**Prediction 10** *If voters have multifaceted social preferences and unequal endowments, then*

1. *If  $\eta$  is sufficiently small (weak altruism), all voters prefer the minimum feasible threshold.*
2. *If  $\eta$  is sufficiently large (strong altruism), voters given the higher endowment prefer a higher threshold than the voters given the lower endowment.*
3. *The threshold chosen by voters with lower endowments exceeds the threshold chosen by payment non-recipients in the game with payments. The threshold chosen by voters with higher endowments is below the threshold chosen by payment recipients under the game with payments. Accordingly, the gap between the thresholds chosen by voters with high and low endowments is smaller in magnitude than the gap between the thresholds chosen by voters who do and do not receive payments in the game with payments.*

**Proof.** In Appendix A.10. ■

## 4 Experimental methods and data

We now map the voting games we implement in the laboratory to the model in Section 3, and describe laboratory procedures.

### 4.1 Voting games

In each voting game played in the laboratory, six subjects — five voters and one politician — constituted the polity. The endowment  $y$  was \$20 in the U.S., and 500 shillings or approximately \$6 in Kenya, while the tax rate  $\tau$  was 0.5. The fraction of collective treasury available



for expropriation ( $\lambda$ ) was set at 0.3; thus 15% of a voter’s endowment was vulnerable to expropriation. The cost of removing the politician,  $\kappa$ , was defined as  $0.1y$ . In the game incorporating vote payments, the payment size  $p$  was also set at  $0.1y$ .

In every experimental session, subjects first played a simple baseline voting game, with no reference to vote payments. Each subject specified his choice as a voter, answering the question, “what is the maximum amount you would allow the politician to expropriate and still re-elect him?” He also stated his expectation regarding how much the politician would expropriate. The subject then specified his choice as a politician, answering the question, “what is the amount you would expropriate from the treasury?” He also specified whether he expected to be re-elected.<sup>12</sup>

Next, we engaged subjects in the voting game including vote payments. Six variants of the basic voting game were conducted, each designed to test a different key hypothesis. The first two, denoted public payment and public gifts, can be described as follows.

1. *Public payment*: Subjects were informed that some subjects will receive a “payment in exchange for your vote”, and were informed of the number and value of the payments. This framing was implemented with one, four, and five payments.
2. *Public gifts*: Subjects were informed that “one (four) voter(s) will receive a gift of \$2. This gift does not come from the treasury.” No quid pro quo for the gift was specified. Again, all subjects were informed about the number and value of the gifts. This framing was implemented with one and four payments.<sup>13</sup>

By examining voter response to the introduction of payments, the variation in this response when the number of payments increases, and the politician’s response and variation thereof, we are able to test the relative salience of social preferences vis-a-vis own-regarding preferences for subjects. The “public gifts” framing also enables us to evaluate the hypothesis that gifts distributed without any *quid pro quo*, for example via clientelistic policies, are as effective as vote payments that incorporate an explicit *quid pro quo*.

We use three additional variations on the voting game to evaluate the postulated comparative statics. First, to generate experimental variation in the salience of reciprocity, we limited the information that subjects received about vote payments and then requested their consent for the payment; both modifications were designed to increase the subject’s perception that he was engaging voluntarily in an implicit transaction conditional on a payment. Second, we examined changes in voter response when the amount of the treasury vulnerable to expropriation varies. These additional voting game variations can be described as follows.

3. *Limited information, no prior consent*: No initial information about the number, size, or nature of payments was provided; the game description simply stated that some voters may receive payments in exchange for their votes. This framing was implemented with four payments.

---

<sup>12</sup>The specific wording of these questions follows the games employed in the U.S. sessions. Minor differences between the U.S. and Kenya sessions are detailed in the on-line Appendix, section D.

<sup>13</sup>Some combinations of framing and number of payments were omitted due to resource constraints.

4. *Limited information, prior consent*: The information and payment structure was identical to the previous framing. However, prior to choosing reelection thresholds, subjects were asked if they would accept a payment, if offered. This framing was implemented with four payments.
5. *Big pot*: The fraction of the treasury vulnerable to expropriation by the politician ( $\lambda$ ) in the basic payment game was increased from 0.3 to 0.5. This framing was implemented with zero and five payments.

Finally, we conducted one game as a robustness check to evaluate the hypothesis that voters were responding merely to the shift in their endowment, rather than to the payment itself.

6. *Unequal endowments*: Subject endowments were rendered unequal ex ante to mimic the wealth distribution induced by the vote payments; i.e., subjects had an endowment of either \$20 or \$22 (parallel to their endowment if they had received a \$2 vote payment). The standard voting game was played, without reference to vote payments.

To reiterate, the first two voting games (public payments and public gifts) are used to elucidate the salience of self-interest and social preferences. If subjects are purely self-interested, a voter’s threshold should be unaffected by the introduction of payments. If subjects are motivated in part by reciprocity, voters who receive a payment will increase their reelection thresholds. If subjects are motivated in part by altruism, voters who do not receive a payment will decrease their reelection thresholds. In each case, predictions differ about how these responses vary as the number of payments increases; in particular, examining this response will allow us to elucidate the significance of inequality aversion, as predictions around the variation with respect to  $N$  vary depending on whether inequality aversion is salient.

The limited information, prior consent, and big pot games are used to test the hypothesized comparative statics. First, if reciprocity is salient in subjects’ preferences, then increasing the experimentally generated sense of reciprocity should render payment recipients more responsive, while payment non-recipients show evidence of a (weakly) larger backlash effect. Second, independent of subject preferences, increasing the share of the treasury that is vulnerable to expropriation should (weakly) increase voters’ reelection thresholds. Finally, the unequal endowment games are used to evaluate the hypothesis that subjects respond identically to a payment labeled a “vote payment” relative to an increase in their initial endowments.

## 4.2 Laboratory procedures

We conducted our experiments at the Harvard Decision Science Lab in Cambridge, MA and the Busara Experimental Laboratory in Nairobi, Kenya between 2013 and 2015. At both sites, subjects were recruited through the laboratories’ centralized databases, and each subject participated in only one session. In the U.S., 450 subjects participated in 62 sessions, and a typical session consisted of 12 subjects; only around 5% of subjects participated in a session with six subjects. In Kenya, 366 subjects participated in 24 sessions, and each session consisted

of 12 or 18 subjects. All experimental sessions were programmed using zTree. Table E2 in the on-line Appendix provides more details on the sample and session structure.

At the beginning of the session, each subject played a set of social preference games. This included the dictator, trust, and ultimatum games; detailed protocols are provided in the on-line Appendix, section C. Next, subjects were engaged in multiple iterations of the voting game; we denote each iteration as a game round. A session included two to three independent game rounds; in Kenya, the sessions always included only two game rounds. Subjects made new decisions in each round, and could not revisit decisions made in previous rounds.

The first game round began with an overview of the simple voting game, with no reference to vote payments. The instructions emphasized that subjects would make choices as both the voter and the politician, and would be assigned to a game role (and paid on the basis of their choices in that role) at the conclusion of the session. Subjects completed a comprehension quiz, and were required to review the correct responses to the comprehension questions before proceeding. Each subject then specified his choices. First, he answered the question, “what is the maximum amount you would allow the politician to expropriate and still re-elect him?”, and also stated his expectation regarding how much the politician would expropriate. The subject then specified his choice as a politician, answering the question, “what is the amount you would expropriate from the treasury?”. He also specified whether he expected to be re-elected.<sup>14</sup>

The use of the strategy method to elicit subject responses is often described as “cold” decision-making, in contrast to “hot” decision-making in which subjects respond directly to another’s choice. In general, the two methods yield similar results, though there is some evidence that the strategy method results in lower levels of punishment (Brandts and Charness, 2011). Given that our primary specification entails within-subject comparisons across games that are all conducted using the strategy method, we do not regard this as a significant source of bias.

In all experimental sessions excluding the limited information sessions, the next game round began with an overview of the voting game including payments, followed by a second comprehension quiz. Two key points were highlighted: first, the money employed for vote payments was separate from subjects’ endowments and the politician’s salary; and second, the vote remained secret and anonymous. In addition, the number and value of payments to be distributed were fully detailed. In the limited information sessions, this entire introduction outlining the role of payments was omitted, and subjects moved directly to specify their in-game decisions.

To maximize power, each subject was asked to specify his reelection threshold with and without payment. Subjects were presented with the following language: “suppose you are a voter and that you have received \$2 in exchange for your vote. What is the maximum amount you would allow the politician to expropriate and still re-elect him/her, given that you received \$2?” To elucidate preferences in the absence of a vote payment, a parallel question is posed: “suppose you are a voter and that you have not received \$2 in exchange for your vote. What is the maximum amount you would allow the politician to expropriate and still re-elect him/her, given that you have not received \$2?” The order in which these questions were posed varied;

---

<sup>14</sup>Again, the specific wording of these questions follows the games employed in the U.S. sessions. Minor differences between the U.S. and Kenya sessions are detailed in the on-line Appendix, section D.

an analysis of this variation can be found in Section 5.1.<sup>15</sup> Finally, subjects specified their choices as politicians, responding to the same question posed in the previous round (“what is the amount you would expropriate from the treasury?”), and specified whether they expected to be reelected.<sup>16</sup>

The unequal endowments game round followed a slightly different structure: rather than specifying choices with and without payment, each subject specified what threshold he would set for the politician if his endowment was \$22, and if his endowment was \$20. Each subject was then asked to specify how much he would expropriate as the politician.

In the U.S., subjects generally played two vote-buying game rounds, and the number of payments varied across game rounds. In Kenya, subjects played a single vote-buying game round. The experimental sessions concluded with subjects completing a brief questionnaire on their demographic characteristics and political experiences.

The six vote-buying session types were implemented with some minor country-specific variations, described in the on-line Appendix, section D.<sup>17</sup> It is important to note that the framing of a payment was uniform in a given session: any variation in the framing of the payment is across sessions, and thus across subjects. However, the fact that subjects in the U.S. played the voting game with payments multiple times with different numbers of payments creates both within-session (within-subject) and cross-session (cross-subject) variation in the number of payments.

Finally, each subject’s compensation was based on his choices in one randomly selected role (politician or voter, and voter who did or did not receive a payment), during a randomly selected game round. During the session, subjects were regularly reminded that any choice could affect their final earnings. Section D.7 in the on-line Appendix provides more details and an example.

### 4.3 Data and descriptive statistics

Again, our sample includes 450 subjects from the U.S. and 355 from Kenya. In our analysis, the unit of interest is the subject-decision. In game rounds with zero or five payments, the subject makes a single decision as a voter, specifying the reelection threshold for the politician. He also makes a single decision as a politician. However, in game rounds with one or four payments, the subject makes two decisions as a voter — the reelection threshold conditional on a payment, and the reelection threshold unconditional on a payment — in addition to a single decision as a politician.

To elicit voters’ re-election thresholds, U.S. subjects were asked to specify the maximum amount they would allow the politician to expropriate and still re-elect him, naming any integer between zero and \$15, inclusive, where \$15 was the maximum level of expropriation available to

---

<sup>15</sup>The question order never varied across different game rounds for the same subject in the same session. A single subject faced only one ordering of the payment questions.

<sup>16</sup>The questions posed about subjects’ expectation of the game outcome were not incentivized.

<sup>17</sup>We denote country-specific session types by numbers. For example, session type A corresponds to public payments; session type A1 was implemented in the U.S., and session type A2 in Kenya. A given session can have up to three game rounds, denoted “game round I”, “game round II”, and “game round III”. Table E1 in the on-line Appendix summarizes the session types implemented and the game rounds included in each session.

the politician. In Kenya, we posed a series of binary choices to increase comprehension: subjects were asked if they would reelect a politician who expropriated a specified amount (0, 75, 150, 250, 300, or 375 Ksh, where 375 Ksh was the maximum level of expropriation available). In section D.3 of the on-line Appendix, we describe how we construct a linear variable capturing the reelection threshold for the Kenyan observations. We drop roughly 7% of observations corresponding to subjects who stated that they would not reelect a politician expropriating a lower amount, but would reelect a politician expropriating a higher amount, leaving a sample of 755 subjects. (We will subsequently demonstrate that our primary results are robust to the inclusion of subjects exhibiting non-monotonic behavior.)

Panel A of Table 1 reports summary statistics for these observations, where Kenyan subject choices are rescaled to lie on the 0 to \$15 scale employed in the U.S.<sup>18</sup> The average voter reelection threshold in the pooled sample is the equivalent of \$7.33, with significantly higher voter thresholds in the U.S. (\$7.70) than Kenya (\$6.59). Kenyan subjects are also significantly more likely to set their reelection threshold at zero. Again, a higher threshold suggests a greater tolerance by subjects as voters of expropriation by politicians.<sup>19</sup> At \$8, the average level of politician expropriation is above the average voter threshold; this is again significantly higher in the U.S. (\$8.39) than in Kenya (\$7.21).

## 5 Empirical analysis

We first evaluate subjects' responses to vote payments as both voters and politicians, as well as variation in these responses given variation in the number of payments. The objective of this analysis is to test the hypotheses generated by the theoretical model around the response to vote payments conditional on different formulations of subject preferences, and to identify whether community targeting dominates individual targeting from the politician's perspective. In addition, we consider comparative statics related to varying the salience of the reciprocal response  $\gamma$  and the maximum expropriation level  $\lambda_p$ , and analyze the unequal endowments game as a robustness check.

### 5.1 Voter response to payments

To evaluate the effect of vote payments on the reelection thresholds subjects choose as voters, we estimate the following equation. Note that  $T_{idgs}$  corresponds to the threshold chosen by subject  $i$  in game decision  $d$  in game round  $g$  in session  $s$ .

$$T_{idgs} = \beta_1 R_{idgs} + \beta_2 P_{gs} + \phi_i + \epsilon_{idgs} \quad (3)$$

---

<sup>18</sup>In addition, choices made by subjects in the big pot games are re-scaled to lie on the same scale from 0 to \$15.

<sup>19</sup>For graphical evidence about different subject choices in the U.S. and Kenya, Figure E3 in the on-line Appendix shows the corresponding kernel densities and histograms of subject choices as voters.

$R_{idgs}$  is a dummy equal to one if subject  $i$ 's decision is conditional on payment receipt, and  $P_{gs}$  is a dummy equal to one if the game round includes vote payments. All specifications are estimated with and without subject fixed effects, with standard errors clustered at the session level. Specifications without subject fixed effects include a Kenya dummy, a control variable for the order in which questions about vote payments are posed, and comprehension index fixed effects. Table E1 in the on-line Appendix includes an overview of all game sessions conducted.

Table 2 reports the primary results analyzing voter behavior, employing all session types except big pot and unequal endowments.<sup>20</sup> First, we observe in Columns (1) and (2) a positive and significant coefficient on recipient ( $\beta_1$ ), demonstrating that subjects who receive a payment increase their reelection thresholds relative to subjects who do not receive a payment. This suggests that voters are not motivated solely by self-interest.

Second, we observe a negative and significant coefficient on payment ( $\beta_2$ ), suggesting a backlash effect: subjects playing a voting game with payments who do not receive a payment are harsher in their treatment of the politician, lowering their reelection thresholds. This suggests the importance of altruism, given that only models including altruism predict a decrease in the reelection threshold for payment non-recipients.<sup>21</sup> The bottom row reports the sum of  $\beta_1$  and  $\beta_2$ ; it is positive and significant at the 10 percent level conditional on subject fixed effects.

In order to examine how voters' responses vary with the number of payments, we estimate the following specification; it includes the recipient dummy variable interacted with the dummy variables  $P_{gs}^1$  and  $P_{gs}^4$ , denoting game rounds in which payments are distributed to one and four subjects, as well as the dummy  $All_{gs}$ , equal to one for game rounds in which all subjects receive payments. Again, this specification is estimated with and without subject fixed effects.

$$T_{idgs} = \beta_1 R_{idgs} \times P_{gs}^1 + \beta_2 R_{idgs} \times P_{gs}^4 + \beta_3 P_{gs}^1 + \beta_4 P_{gs}^4 + \beta_5 All_{gs} + \phi_i + \epsilon_{idgs} \quad (4)$$

The results in Columns (3) and (4) in Table 2 suggest that both the positive effect of payments on recipients' reelection thresholds and the negative effect on the thresholds of non-recipients are growing in magnitude as the number of payments increases. The bottom rows of the table report the linear combinations  $\beta_1 + \beta_3$  and  $\beta_2 + \beta_4$ , capturing the net effect of a payment when one payment and four payments are distributed, respectively. The net effect of a \$2 payment in the one-payment game is insignificant. The net effect of a \$2 payment in the four-payment and five-payment games is positive and significant, and larger for the all-payment game; the recipient voter(s) allows the politician to expropriate about 40 cents more if four voters receive payments, and 70 cents more if all voters receive payments. We can reject the hypothesis that the net effect of a single payment,  $\beta_1 + \beta_3$ , is equal to the effect of five payments,  $\beta_5$ . The hypothesis that  $\beta_2 + \beta_4 = \beta_5$  cannot be rejected, though  $p=.11$  for the specification

<sup>20</sup>This is a sample of 2136 subject-decisions. The unequal endowment session types, F1 and F2, also include some game rounds with five payments. For clarity of the within-subject comparisons, however, data from session types F are omitted. The results are consistent if this data is also included.

<sup>21</sup>The sign and significance of  $\beta_1$  and  $\beta_2$  are consistent irrespective of order of posing "reelection threshold - payment" and "reelection threshold - no payment" questions. These results are available upon request.

employing subject fixed effects.<sup>22</sup>

A vote payment of \$2 also leads to a decline of about 60 cents in the amount voters who do not receive a payment are willing to allow the politician to expropriate if only one voter receives a payment, and a decline of about 73 cents in the non-recipient threshold if four voters receive payments — i.e., the backlash effect is increasing in magnitude as the number of payments increases. However, the difference between these two coefficients is not statistically significant.

Finally, we estimate the following specification to examine whether there is any heterogeneity in the response to payments when the payment is framed as a gift with no quid pro.

$$T_{idgs} = \beta_1 R_{idgs} + \beta_2 R_{idgs} \times Gift_{gs} + \beta_3 P_{gs} + \beta_4 P_{gs} \times Gift_{gs} + \phi_i + \epsilon_{idgs} \quad (5)$$

Columns (5) and (6) report the results, and we observe that  $\beta_2$  and  $\beta_4$  are small in magnitude and insignificant. That suggests subject responses generally do not vary when alternate framings of an identical payment are introduced; if we interact the gift dummy with dummy variables for framings including specific numbers of payments, we observe the same pattern.<sup>23</sup>

The observed gap in reelection thresholds across subjects who do and do not receive a payment, an increase in the recipient response as number of payments increases, and a more intense backlash effect among non-recipients as the number of payments increases is inconsistent with subjects being motivated solely by self-interest. Rather, this evidence is consistent with the hypothesis that subjects are characterized by multifaceted social preferences encompassing altruism, reciprocity, and inequality aversion (specification P4). Given a sufficiently high degree of inequality aversion and a large marginal reciprocal response, voters' reelection thresholds are decreasing in  $n$  for voters who do not receive a payment, and increasing in  $n$  for voters who receive a payment. This is exactly the pattern we observe. In addition, the results suggest that payments structured as clientelistic transfers without any explicit quid pro quo may be as effective as vote payments in shifting voters' behavior.<sup>24</sup>

## 5.2 Politician response to payments

Do politicians' expropriation choices shift when vote-buying is introduced? Our model predicts that politicians should set their expropriation level equal to the reelection threshold chosen by the majority of voters. Given our previous findings, this suggests that politician expropriation should increase when four or five payments are introduced, with the increase larger in magnitude

---

<sup>22</sup>The absence of an increase in voters' thresholds when one payment is introduced is inconsistent with the theoretical predictions given  $\lambda$  is modeled as continuous. However, this empirical pattern could be consistent with an alternate model where  $\lambda$  is modeled as discrete.

<sup>23</sup>In the on-line Appendix, we reproduce the core results around voter behavior reported in Table 2 employing two alternate samples. Table E5 expands the sample to include Kenyan subjects who exhibit non-monotonic behavior, and Table E6 limits the sample to exclude subjects who score in the bottom decile of game comprehension. In both cases, our results are robust.

<sup>24</sup>We can also demonstrate that the observed pattern is inconsistent with subjects who are motivated by only one dimension of social preferences. Given subjects who are purely altruistic or averse to inequality, the effect of a payment on the reelection threshold would be uniform for voters who do and do not receive a payment. Given purely reciprocal subjects, voters who do not receive a payment would not alter their choice of threshold relative to the base game with no payments.

for games including five payments. To evaluate this hypothesis, we estimate the following specification:

$$Exp_{igs} = \beta_1 P_{gs} + \phi_i + \epsilon_{igs} \quad (6)$$

$Exp_{igs}$  denotes the amount expropriated by subject  $i$  as a politician in game round  $g$  in session  $s$ . Parallel specifications will be estimated including dummy variables for various numbers of payments, as well as an interaction with the gift framing.

Table 3 presents the results. Columns (1) and (2) show that the introduction of vote payments increases politician expropriation by around \$0.50, an increase of 6% relative to the mean. Columns (3) and (4) show a larger increase in expropriation when payments are distributed to all subjects, but the difference is statistically insignificant. In addition, the fact that there is an increase in politician expropriation when only one payment is distributed is not consistent with the theoretical predictions; however, this increase is not statistically significant in the absence of subject fixed effects. Finally, in Columns (5) and (6) we observe no significant variation in expropriation when the gift framing is employed.

Importantly, the magnitudes of the observed coefficients are consistent with the observed changes in voter behavior. The average increase in the voter threshold when payments are introduced is between \$0.30 and \$0.50, while the increase in politician expropriation is \$0.45. The increase in the voter threshold when all voters receive payments is around \$0.70, while the increase in politician expropriation is \$0.80. This pattern is also consistent with subjects' beliefs about the probability that they will be reelected as politicians. We observe no significant shift in subjects' reelection expectations once payments are introduced, suggesting that they accurately infer that both politician expropriation and voter thresholds are increasing.

Turning to the welfare of subjects as voters, the introduction of vote payments renders voters who do not receive the transfers worse off, as expropriation increases. We do not observe an increase in expropriation that exceeds the \$2 value of the vote payment, and thus subjects who receive payments are better off when payments are introduced. In a real-world polity, the potential losses due to politician expropriation are presumably several orders of magnitude larger than a typical voter incentive, but this difference cannot easily be replicated in the laboratory.

## 5.3 Comparative statics

### 5.3.1 Variation in reciprocity

We experimentally vary the subjects' degree of reciprocity toward the politician in two ways. First, we conduct sessions in which limited information about payments is provided, consisting of a simple statement in the game introduction noting that some voters may receive payments in exchange for their votes. The subjects are not informed of the number of payments distributed, the targeting mechanism, or the payments' value. Providing limited information may increase subjects' reciprocal motivation, given that a more private payment seems more targeted. Second, in a subset of the limited information sessions, subjects are asked whether or not they would like to accept a payment, and only then are asked to specify their reelection threshold



in case they received a payment. (Even subjects who state they would not like to accept the payment specify this threshold.) The active provision of consent is designed to mimic a contract between the politician and the voter.

In order to test these hypotheses, we estimate the following specification including interaction terms with the limited information and prior consent framings, utilizing the same sample employed in the previous section. The limited information dummy variable is equal to one for sessions that employ limited information and no prior consent.<sup>25</sup>

$$T_{idgs} = \beta_1 R_{idgs} + \beta_2 R_{idgs} \times Lim_{gs} + \beta_3 R_{idgs} \times Cons_{gs} \\ + \beta_4 P_{gs} + \beta_5 P_{gs} \times Lim_{gs} + \beta_6 P_{gs} \times Cons_{gs} + \beta_7 All_{gs} + \beta_8 Cons_{gs} + \phi_i + \epsilon_{idgs} \quad (7)$$

The results are reported in Columns (1) and (2) of Table 4; in general, the introduction of limited information and prior consent does not significantly shift voters' responses. While the interaction terms with the payment dummy  $\beta_5$  and  $\beta_6$  are negative, consistent with the theoretical prediction of larger backlash effects given a higher degree of reciprocity, the coefficients are small in magnitude. The estimated interaction terms for the prior consent framing  $\beta_2$  and  $\beta_3$  are heterogeneous in sign; there is some weak evidence that soliciting prior consent renders voters more responsive to payments.<sup>26</sup>

Further suggestive evidence can be generated by comparing our two experimental sites. As previously noted, Kenyan subjects on average demonstrate much greater reciprocity compared to the U.S. subjects.<sup>27</sup> Perhaps unsurprisingly, we also observe that the Kenyan subjects' response to payments is up to 70% larger, though this difference should be interpreted cautiously given that there are many other differences between the subject pools.

### 5.3.2 Variation in the maximum expropriation level

In another variant of the voting game, the fraction of the treasury vulnerable to expropriation  $\lambda$  was increased from 35% to 50%; the voting game was then played without any payments and with five payments, while the vote payment remained fixed at \$2. Data from these "big pot" sessions allows us to examine whether voters' responsiveness to payments diminishes when they risk greater losses from the politician's expropriation.

<sup>25</sup>The dummy variables  $All_{gs}$  and  $Cons_{gs}$  vary within-subject and thus are included in subject fixed effect specifications. The gift, limited information, and prior dummy variables, by contrast, only vary across subjects and are omitted from subject fixed effects specifications. More details on coding are provided in Table E4 in the on-line Appendix. In the specifications without subject fixed effects, we continue to include controls previously enumerated for the no subject fixed effect specification.

<sup>26</sup>Roughly 80% of subjects indicated they would consent to receive a vote payment. Compared to those who declined to provide consent, we observe a greater increase in voter thresholds among subjects who state they would accept the payment, though clearly providing consent may be endogenous to other unobserved subject characteristics. Tabulations are not reported for concision, but are available upon request.

<sup>27</sup>Subjects at both sites are engaged in a simple trust game in which the sender has the option to send all or none of an endowment of \$4 or 120 shillings, and whatever is sent is tripled prior to the partner's choice of how much to return. In the case of a positive transfer, Kenyan subjects return on average \$.50 more to the sender, and are 14 percentage points more likely to return a non-zero amount. (The magnitudes here are normalized with respect to the endowment in the U.S. sessions.)

We estimate the following specification, where  $Big_{gs}$  is equal to one if the session includes a big pot vulnerable to expropriation.

$$T_{idgs}^{frac} = \beta_1 P_{gs} + \beta_2 R_{idgs} + \beta_3 All_{gs} + \beta_4 All_{gs} \times Big_{gs} + \phi_i + \epsilon_{idgs} \quad (8)$$

Columns (3) and (4) of Table 4 report the findings: the big pot dummy is positive and significant, while the interaction between big pot and payment is negative and significant.

Again, the previous evidence suggests that all three dimensions of social preferences are relevant for voters' choices, and accordingly subjects are not choosing the minimum sustainable threshold in equilibrium. Thus an increase in  $\lambda$  will shift voters' chosen thresholds only if the previously chosen thresholds are below the new minimum sustainable level. In this case, voters will increase their thresholds to the new minimum sustainable level. Mechanically, this increase will be larger for payment non-recipients, as they previously chose lower payment thresholds.

In fact, this is exactly the pattern we observe. There is a significant increase in voter thresholds, suggesting both thresholds chosen *ex ante* are below the new minimum sustainable threshold given the higher amount vulnerable to expropriation. However, the increase is significantly larger for payment non-recipients.

#### 5.4 Additional robustness checks

An alternative interpretation of the results is that the subjects' responses as voters simply reflect a reaction to the receipt of a payment that is directed at the experimenter, but externalized via decisions about re-electing the politician. For example, subjects who receive a payment may be gratified and feel more generous; subjects who do not receive a payment may be angry.<sup>28</sup>

To test this hypothesis, we use the "unequal endowments" game. This game is equivalent to the simple voting game without payments; however, four voters have endowments of \$22, and one voter has an endowment of \$20, parallel to the endowments that are induced in the four-payment voting game. All subjects are informed of this distribution of endowments. The subjects are then engaged in the simple voting game without payments.

Our model of subject preferences suggests a very different response to this variation in endowments, relative to the response to a payment. Intuitively, since there is no payment, subjects with high and low endowments are not differentiated by any reciprocal response, and since they all pay the same tax (\$10), altruism would likewise not generate any differences in their reelection thresholds. Higher-endowment individuals would allow a higher threshold due to inequality aversion, but this difference is strictly smaller in magnitude than the difference generated by a payment.

To examine whether high endowment individuals respond in the same way as subjects who receive a transfer designated as a vote payment, we consider the full sample of games excluding big pot (session types A–D and F). The following specification is again estimated with and

---

<sup>28</sup>We can rule out the hypothesis that subjects simply seek to reach a target level of earnings in the experimental session. In this case, we would see no change in behavior between the voting game without any payments, and the decisions subjects make in a voting game in which payments are distributed but they do not receive a payment.

without subject fixed effects.<sup>29</sup>

$$T_{idgs} = \beta_1 R_{idgs} + \beta_2 High_{idgs} + \beta_3 P_{gs} + \beta_4 Ineq_{gs} + \phi_i + \epsilon_{idgs} \quad (9)$$

The dummy variable  $High_{idgs}$  is equal to one if a subject has a high endowment, and zero otherwise;  $Ineq_{gs}$  is equal to one for the unequal endowment game rounds. Again, the theoretical predictions suggest that subjects who receive high endowments should set higher thresholds than subjects who receive low endowments, but the magnitude of this gap should be smaller than the gap between subjects who do and do not receive payments. Accordingly, we expect the coefficient  $\beta_2$  to be positive, but strictly smaller in magnitude than  $\beta_1$ .

The results are reported in Columns (5) and (6) of Table 4, and show a consistently positive coefficient  $\beta_1$  and a coefficient  $\beta_2$  that is also positive but much smaller in magnitude (and also, noisily estimated). The final rows of the table reports the p-values corresponding to the tests  $\beta_1 = \beta_2$  and  $\beta_1 + \beta_3 = \beta_2 + \beta_4$ : i.e., whether the effect of a payment is the same as the effect of a high endowment, and whether the net effect of a payment in a payment game is the same as the net effect of a high endowment in the unequal endowments game. In both specifications, we can reject both hypotheses at the 5 percent level, suggesting that the effect of receiving a payment is not the same as the effect of a high initial endowment. While the results should be interpreted cautiously given that the salience of an additional transfer (in the form of a payment) may be significantly greater than a higher endowment assigned at the initiation of the game session, this pattern is consistent with the hypothesis that voters are not simply responding to the payment by externalizing a general sense of gratitude at the experimenter.

## 6 Conclusion

Vote-buying is an important phenomenon in politics around the world. However, the prevalence of community-level saturation of vote payments has remained largely unexamined in the existing literature, despite the fact that this phenomenon poses an empirical puzzle.

In this paper, we develop a model designed to identify how social preferences on the part of voters may shape the response to broadly targeted vote payments, and test this model by evaluating subject behavior in a simple game of retrospective voting conducted with 816 subjects in the Harvard Decision Science Laboratory and the Busara Experimental Laboratory in Nairobi, Kenya. Our results suggest that voters are highly responsive to payments: those who receive payments are less willing to punish the politician, while those who do not receive payments are more willing to punish the politician, suggesting possible backlash at their exclusion. Both responses become larger in magnitude as the number of payments increases. At the same time, we observe greater expropriation by subjects as politicians when vote payments are introduced.

The observed pattern is not consistent with a model of subjects who seek purely to maximize

---

<sup>29</sup>The sample includes game round I (no payments) and any game round including four payments from session types A-F as specified in Table E1: A1-III, A2-II, B1-III, B2-II, C1-II, C2-II, D1-II, D2-II, F1-I, F2-I and F2-II. In the specifications without subject fixed effects, we include a Kenya dummy, a control variable for the order in which questions about the receipt of vote payments is posed, and comprehension index fixed effects.

their own earnings. Rather, it is consistent with the hypothesis that individuals are motivated by a diverse set of social preferences — altruism, inequality aversion, and reciprocity — all of which shape their response to vote payments. Importantly, these preferences also imply that a rent-seeking politician will favor community targeting over individual-level targeting in order to maximize his probability of reelection. In addition, our analysis suggests that vote-buying reduces voters' willingness to punish politicians for rent-seeking, absent any selection channel. Accordingly, vote-buying could have important implications for governance even if it has no impact on the identity of the winning candidate.

Our results also link to a broader observation in the literature that there is a positive correlation between social capital and elite capture of the policy-making process in developing countries (Acemoglu et al., 2014; Anderson et al., 2015). One channel for this correlation could be that strong social capital renders clientelistic mechanisms such as vote-buying more effective, even when vote payments are relatively anonymous and unenforceable. This implies that enhancing other, non-electoral methods of political accountability may be particularly important in the developing world.

## References

- Abbink, Klaus, Bernd Irlenbusch, and Elke Renner**, “An experimental bribery game,” *Journal of Law, Economics, and Organization*, 2002, 18 (2), 428–454.
- Acemoglu, Daron, Tristan Reed, and James A. Robinson**, “Chiefs: Economic development and elite control of civil society in Sierra Leone,” *Journal of Political Economy*, 2014, 122 (2), 319–368.
- Anderson, Siwan, Patrick Francois, and Ashok Kotwal**, “Clientelism in Indian villages,” *American Economic Review*, 2015, 105 (6), 1780–1816.
- Andreoni, James and John Miller**, “Giving according to GARP: An experimental test of the consistency of preferences for altruism,” *Econometrica*, 2002, 70 (2), 737–753.
- Baland, Jean-Marie and James Robinson**, “Land and power: Theory and evidence from Chile,” *American Economic Review*, 2008, 98 (5), 1737–1765.
- Banerjee, Abhijit, Selvan Kumar, Rohini Pande, and Felix Su**, “Do informed voters make better choices? Experimental evidence from urban India,” 2011. Working paper.
- Bo, Ernesto Dal**, “Bribing Voters,” *American Journal of Political Science*, 2007, 51 (4), 789–803.
- Bolton, Gary and Axel Ockenfels**, “ERC: A theory of equity, reciprocity, and competition,” *American Economic Review*, 2000, 90 (1), 166–193.
- Brandts, Jordi and Gary Charness**, “The strategy versus the direct-response method: a first survey of experimental comparisons,” *Experimental Economics*, 2011, 14, 375–398.
- Breeding, Mary**, “Micropolitics and vote banks,” *Economic and Political Weekly*, 2011, 46 (1), 71–77.
- Burgess, Robin, Remi Jedwab, Edward Miguel, Ameet Morjaria, and Gerard Padró i Miquel**, “The value of democracy: Evidence from road building in Kenya,” *American Economic Review*, 2015, 105 (6), 1817–1851.
- Cardenas, Juan-Camilo**, “Real worth and experimental cooperation: experiments in the field lab,” *Journal of Development Economics*, 2003, 70, 263–289.
- **and Jeffrey Carpenter**, “Behavioral development economics: Lessons from field labs in the developing world,” *Journal of Development Studies*, 2008, 44 (3), 331–338.
- Carter, Michael and Marco Castillo**, “Trustworthiness and social capital in South Africa: Analysis of actual living standards experiments and artefactual field experiments,” 2009. University of Wisconsin Working Paper.

- Charness, Gary and Ernan Haruvy**, “Altruism, equity, and reciprocity in a gift-exchange experiment: an encompassing approach,” *Games and Economic Behavior*, 2002, 40 (2), 203–231.
- Croke, Kevin**, “Tools of single party hegemony in Tanzania: evidence from surveys and survey experiments,” *Democratization*, 2017, 24 (2), 189–208.
- Cruz, Cesi, Philip Keefer, and Julien Labonne**, “Incumbent advantage, voter information and vote buying,” 2015. Mimeo.
- Dekel, Eddie, Matthew O. Jackson, and Asher Wolinsky**, “Vote buying: General elections,” *Journal of Political Economy*, 2008, 116 (2), 351–380.
- DellaVigna, Stefano**, “Psychology and economics: Evidence from the field,” *Journal of Economic Literature*, 2009, 47 (2), 315–372.
- Dufwenberg, Martin and Georg Kirchsteiger**, “A theory of sequential reciprocity,” *Games and Economic Behavior*, 2004, 47 (2), 268–298.
- Fehr, Ernest and Klaus M. Schmidt**, “A theory of fairness, competition, and cooperation,” *The Quarterly Journal of Economics*, 1999, 114 (3), 817–868.
- **and Klaus Schmidt**, “The economics of fairness, reciprocity and altruism - experimental evidence and new theories,” in Serge-Christophe Kolm and Jean Mercier Ythier, eds., *Handbook of the Economics of Giving, Altruism and Reciprocity*, Netherlands: Elsevier, 2007, pp. 615–691.
- Finan, Federico and Laura Schechter**, “Vote-buying and reciprocity,” *Econometrica*, 2012, 80 (2), 863–881.
- Fujiwara, Thomas and Leonard Wantchekon**, “Can informed public deliberation overcome clientelism? Experimental evidence from Benin,” *American Economic Journal: Applied Economics*, 2013, 5 (4), 241–255.
- Greig, Fiona and Iris Bohnet**, “Is there reciprocity in a reciprocal-exchange economy? Evidence of gendered norms from a slum in Nairobi, Kenya,” *Economic Inquiry*, 2008, 46 (1), 77–83.
- Groseclose, Timothy and James Snyder**, “Buying super-majorities,” *American Political Science Review*, 1996, 90, 303–15.
- Henrich, Joseph, Robert Boyd, Samuel Bowles, Colin Camerer, Ernst Fehr, Herbert Gintis, and Richard McElreath**, “In search of homo economicus: Behavioral experiments in 15 small-scale societies,” *American Economic Review*, 2001, 91 (2), 73–78.
- Hicken, Allen, Stephen Leider, Nico Ravanilla, and Dean Yang**, “Temptation in vote-selling: Evidence from a field experiment in the Philippines,” 2014. CESifo Working Paper, No. 4828.

- Keefer, Philip and Razvan Vlaicu**, “Democracy, credibility, and clientelism,” *The Journal of Law, Economics, and Organization*, 2008, *24* (2), 371406.
- Kitschelt, Herbert**, “Linkages between citizens and politicians in democratic polities,” *Comparative Political Studies*, 2000, *33*, 845–879.
- Kramon, Eric**, “Why do politicians buy votes when the ballot is secret? Theory and experimental evidence from Kenya,” 2011. Working paper.
- Malmendier, Ulrike and Klaus Schmidt**, “You owe me,” 2011.
- Nichter, Simeon**, “Vote buying or turnout buying? Machine politics and the secret ballot,” *American Political Science Review*, 2008, *102* (1), 19–31.
- Pan, Xiaofei Sophia and Erte Xiao**, “It’s not just the thought that counts: An experimental study on the hidden cost of giving,” 2014.
- Rabin, Matthew**, “Incorporating fairness into game theory and economics,” *American Economic Review*, 1993, *83*, 1281–1302.
- Robinson, James and Thierry Verdier**, “The political economy of clientelism,” *Scandinavian Journal of Economics*, 2013, *115* (2), 260–291.
- Schnellenbach, Jan and Christian Schubert**, “Behavioral political economy: A survey,” *European Journal of Political Economy*, 2015, *40*, 395417.
- Snyder, James**, “On buying legislatures,” *Economics and Politics*, 1991, *3*, 93–109.
- Stokes, Susan**, “Perverse accountability: A formal model of machine politics with evidence from Argentina,” *American Political Science Review*, 2005, *99* (3), 315–325.
- , “Is vote-buying undemocratic?,” in Frederic Charles Schaffer, ed., *Elections for sale: The causes and consequences of vote-buying*, Boulder: Lynne Rienner Publishers, 2007.
- Strassmair, Christina**, “Can intentions spoil the kindness of a gift? - An experimental study,” 2009. University of Munich Discussion Paper.
- Vicente, Pedro**, “Is vote buying effective? Evidence from a field experiment in West Africa,” *Economic Journal*, 2014, *124* (574), F356F387.

## 7 Figures and Tables

Table 1: Summary statistics

	U.S. mean	Kenya mean	U.S. obs.	Kenya obs.
<b>Panel A: Subject choices in voting game</b>				
Voter threshold	7.70	6.59	1794	886
Dummy for threshold at zero	.11	.16	1794	886
Politician expropriation	8.39	7.21	1236	610
Dummy for zero expropriation	.09	.26	1236	610
Dummy for full expropriation	.20	.22	1236	610
<b>Panel B: Experimental measures of social preferences</b>				
Dummy for sending in the dictator game	.66	.81	372	281
Dummy for sending in trust game	.83	.64	372	281
Dummy for returning in trust game	.42	.58	372	281
Threshold in ultimatum game	2.91	5.72	150	118
Reciprocity	.06		222	

Notes: Each panel reports means of the specified characteristics by experimental site. The data reported for Kenyan subjects is restricted to subjects who exhibit monotonic behavior and are thus included in the primary sample. Panel A reports summary statistics for subjects' choices as voters and politicians, including the reelection threshold as a voter, a dummy for the threshold at zero, the amount expropriated as a politician, and dummy variables for expropriating the minimum or maximum amount. This data is reported at the level of the subject-game round-game decision.

Panel B reports summary statistics for subjects' social preferences; this sample includes all subjects other than those included in session type F (unequal endowments). The measures reported include a dummy variable for sending a positive amount in the dictator game, a dummy variable for sending a positive amount in the trust game, a dummy variable for whether the subject returned any funds in the trust game, a reciprocity index, and the threshold in the ultimatum game; the reciprocity index can be calculated only for U.S. subjects in 2014 and 2015, and the ultimatum game threshold is available only for subjects in 2014. The reciprocity index is defined as  $Perc_i^{high} - Perc_i^{low}$ , censored at zero. All variables are normalized with respect to the dollar scales employed in the U.S.



Table 2: Voter behavior

	Voter reelection threshold					
	(1)	(2)	(3)	(4)	(5)	(6)
Recipient	.963 (.138)***	.964 (.135)***			.920 (.185)***	.922 (.179)***
Recipient x one payment			.278 (.205)	.278 (.205)		
Recipient x four payments			1.116 (.163)***	1.116 (.163)***		
Recipient x gift					.123 (.271)	.121 (.269)
Payment	-.703 (.196)***	-.670 (.188)***			-.702 (.279)**	-.687 (.255)***
One payment			-.595 (.313)*	-.597 (.253)**		
Four payments			-.752 (.189)***	-.733 (.188)***		
All payments			.593 (.301)**	.729 (.224)***		
Payment x gift					-.003 (.393)	.057 (.367)
$\beta_1 + \beta_2$	.260 (.173)	.294 (.170)*				
$\beta_1 + \beta_3$			-.318 (.270)	-.319 (.224)		
$\beta_2 + \beta_4$			.364 (.195)*	.383 (.191)**		
Sample			Session types A-D			
Mean dep. var.	7.07	7.07	7.07	7.07	7.07	7.07
Fixed effects		Subject		Subject		Subject
Obs.	2136	2136	2136	2136	2136	2136

Notes: The dependent variable is the maximum threshold of expropriation at which the subject will vote to reelect the politician. The independent variables are a dummy variable for receiving a payment and receiving a payment in a game with one or four payments; the dummy variables for the game including payments or including one or four payments; a dummy for the game including payments for all subjects; and the recipient and payment dummies interacted with a dummy for the gift framing.  $\beta_1 + \beta_2$  reports the sum of the coefficients on recipient and payment.  $\beta_1 + \beta_3$  and  $\beta_2 + \beta_4$  report the sum of the recipient and payment dummies interacted with the one payment and four payment dummies, respectively.

Fixed effects are as specified in the table; specifications without subject fixed effects include a Kenya dummy, a dummy for ordering of the payment questions, and comprehension index fixed effects. All specifications include standard errors clustered at the experimental session level. Asterisks indicate significance at the ten, five, and one percent level.

Table 3: Politician behavior

	Politician expropriation					
	(1)	(2)	(3)	(4)	(5)	(6)
Payment	.499 (.211)**	.553 (.202)***			.432 (.285)	.427 (.277)
One payment			.482 (.357)	.478 (.212)**		
Four payments			.492 (.242)**	.523 (.239)**		
All payments			.561 (.364)	.806 (.256)***		
Payment x gift					.205 (.442)	.381 (.356)
Sample			Session types A-D			
Mean dep. var.	7.82	7.82	7.82	7.82	7.82	7.82
Fixed effects		Subject		Subject		Subject
Obs.	1404	1404	1404	1404	1404	1404

Notes: The dependent variable is the politician's level of expropriation. The independent variables are dummy variables for the game including payments, and for the game including one or four payments; a dummy for the game including payments for all subjects; and the payment dummy interacted with a dummy for the gift framing. Fixed effects are as specified in the table; specifications without subject fixed effects include a Kenya dummy, a dummy for ordering of the payment questions, and comprehension index fixed effects. All specifications include standard errors clustered at the experimental session level. Asterisks indicate significance at the ten, five, and one percent level.

Table 4: Comparative statics

	Voter threshold					
	(1)	(2)	(3)	(4)	(5)	(6)
Recipient	.956 (.158)***	.956 (.158)***	.910 (.139)***	.910 (.139)***	.989 (.142)***	.960 (.133)***
Recipient x secret	-.536 (.493)	-.536 (.493)				
Recipient x consent	.271 (.256)	.271 (.256)				
Payment	-.597 (.246)**	-.570 (.242)**	-.704 (.197)***	-.679 (.189)***	-.717 (.201)***	-.676 (.183)***
Payment x secret	-.050 (.464)	-.209 (.446)				
Payment x consent	-.314 (.521)	-.341 (.519)				
All payment	.774 (.557)	.208 (.425)	.498 (.328)	.466 (.208)**		
Big pot int.			-.472 (.426)	-.465 (.368)		
Big pot			2.978 (.790)***	12.946 (.190)***		
High endowment					.216 (.162)	.216 (.162)
Unequal endowment					1.316 (.531)**	.877 (.364)**
$\beta_1 + \beta_2 + \beta_3 + \beta_4$			-.018 (.027)	-.020 (.022)		
Sample						
Mean dep. var.	7.07	7.07	7.07	7.07		
Fixed effects		Subject		Subject		Subject
Obs.	2136	2136	2326	2326	2466	2466

Notes: The dependent variable is the maximum threshold of expropriation at which the subject will vote to reelect the politician. In Columns (1) and (2), the independent variables are a dummy variable for receiving a payment and its interactions with dummy variables for the secret payment framing and the prior consent framing, as well as a dummy variable for the game including payments, also interacted with the secret and prior consent framing. In Columns (3) and (4), the independent variables include the recipient and payment dummies, a dummy for the game including payments for all subjects, a dummy for the big pot game, and the interaction between the two. In Columns (5) and (6), the independent variables include the recipient and payment dummies, and the dummy variables for the unequal endowments framing and for an individual receiving a high endowment.  $\beta_1 + \beta_2 + \beta_3 + \beta_4$  reports the sum of the recipient and payment dummies, along with the all payment dummy and the interaction with big pot.

Fixed effects are as specified in the table; specifications without subject fixed effects include a Kenya dummy, a dummy for ordering of the payment questions, and comprehension index fixed effects. All specifications include standard errors clustered at the experimental session level. Asterisks indicate significance at the ten, five, and one percent level.

## A Appendix - Proofs

### A.1 Characterization of pure strategy Nash equilibria

There are multiple pure strategy Nash equilibria in the voting game described in the main text. For any expropriation level  $\lambda_p \cdot T \geq \lambda^* \cdot T$ , where  $\lambda^* \cdot T = \lambda \cdot T - (0.5 \cdot y + \epsilon)$ , there exists an equilibrium in which the politician expropriates  $\lambda_p \cdot T$  and voters set the reelection threshold at  $\lambda_v = \lambda_p$ . For any expropriation level  $\lambda_p \cdot T \leq \lambda^* \cdot T$ , the politician's expected payoff from playing the strategy  $\lambda \cdot T$  is  $0.5 \cdot y + \lambda_p \cdot T + \epsilon$ . If he deviates to the maximum expropriation  $\lambda \cdot T$ , he obtains payoff  $0.5 \cdot y + \lambda \cdot T$ . Such a deviation would therefore be profitable. For any  $\lambda_p \cdot T > \lambda^* \cdot T$ , a deviation would yield a payoff of at most  $\lambda^* \cdot T$ . Accordingly, there is no profitable deviation for the politician. Similarly, each voter would receive zero benefit from altering his reelection threshold conditional on all other voters utilizing the threshold  $\lambda_p$ .

Notice that, with pure self-interest, the presence of vote payments does not affect the set of pure strategy Nash equilibria, since  $\lambda^*$  is independent of  $n$ .

### A.2 Proof of Prediction 1

If the politician chooses to expropriate  $\lambda_p \cdot T$ , his utility can be described as follows, assuming each voter has the same income  $y$ .

$$U_p = 0.5y + \lambda_p \tau Y + (1 - \rho)(0.5y + \epsilon) \quad (10)$$

Thus regardless of the value of  $\rho$ , the expropriation level that maximizes the politician's utility is  $\lambda^* = \lambda$ .

We would like to derive the value  $\lambda^*$  above which a PSNE exists such that the politician expropriates  $\lambda_p \cdot T$  and the voters set threshold  $\lambda_p \tau Y$ . This value  $\lambda^*$  is given by the solution to the following equation.

$$0.5y + \lambda \tau y = y + \epsilon + \lambda_p \tau y \quad (11)$$

For any total expropriation level  $\lambda_p \cdot T \leq \lambda T - (0.5y + \epsilon)$ , the politician's expected payoff from playing the strategy  $\lambda_p$  is  $y + \lambda_p \cdot T + \epsilon$ . If he deviates to the maximum expropriation level  $\lambda \cdot T$ , he obtains payoff  $0.5y + \lambda T$ . For any  $\lambda_p \cdot T > \lambda T - (0.5y + \epsilon)$ , a deviation would yield a payoff of at most  $\lambda T - (0.5y + \epsilon)$ , and thus there is no profitable deviation for the politician. Similarly, each voter would receive zero benefit from altering his reelection threshold conditional on all other voters utilizing the threshold  $\lambda_v = \lambda_p$ .

The introduction of vote payments does not shift the above thresholds, as the effect of payments enters additively in the politician's utility function.

### A.3 Proof of Prediction 2

**(Part 1: Voter's choice of expropriation threshold)** Given no payments, the voter's utility is maximized when the threshold for expropriation is set at the minimum level  $\lambda_v = \lambda^*$ . Consider voter  $i$  and denote by  $n_i$  the number of payments received by voters other than voter

$i$ . If  $n$  is the total number of payments, then  $n_i = n$  if voter  $i$  did not receive a payment ( $p_i = 0$ ), and  $n_i = n - 1$  if voter  $i$  received a payment ( $p_i = p$ ). The welfare maximizing equilibrium for voter  $i$  is the one in which he chooses threshold  $\lambda_v$  such that

$$\lambda_i = \arg \max_{\lambda_i \in [\lambda^*, \lambda]} E_i + \gamma f \left( \tau N y (\lambda_i - \lambda^e) \left( p_i - \frac{n}{N} p \right) \right) \quad (12)$$

This yields

$$\lambda_i = \arg \max_{\lambda_v \in [\lambda_p, \lambda]} y - \lambda_i \tau y + p_i + \gamma f (\tau y (\lambda_i - \lambda^e) (N p_i - n p)) \quad (13)$$

This expression can be further simplified to the following.

$$\lambda_i = \begin{cases} \lambda^* & \text{if } \gamma (N p_i - n p) \cdot f' (\tau y (\lambda^* - \lambda^e) (N p_i - n p)) \leq 1 \\ \lambda_i^* & \text{otherwise} \end{cases} \quad (14)$$

where  $\lambda_i^* \in (\lambda^*, \lambda]$  is defined implicitly by

$$1 = \gamma (N p_i - n p) f' (\tau y (\lambda_i^* - \lambda^e) (N p_i - n p)) \quad (15)$$

If  $p_i = 0$ , then

$$\gamma (-n p) f' (\tau y (\lambda_i - \lambda^e) (-n p)) < 0 \quad (16)$$

$$\lambda_i(p_i = 0) = \lambda^* \quad (17)$$

If  $p_i = p$  and

$$\gamma (N p - n p) f' (\tau y (\lambda_i - \lambda^e) (N p - n p)) < 1 \quad (18)$$

then also

$$\lambda_i(p_i = p) = \lambda^* \quad (19)$$

Otherwise,

$$\gamma (N p - n p) f' (\tau y (\lambda_i - \lambda^e) (N p - n p)) > 1 \quad (20)$$

and

$$\lambda_i(p_i = p) = \lambda_i^* > \lambda^* \quad (21)$$

**(Part 2: Effect of increase in number of payments)** For the voter who does not receive a payment,

$$\lambda_i = \lambda^* = \lambda - \frac{0.5y + \epsilon}{\tau y} \quad (22)$$

Accordingly, increasing  $n$  has no effect on  $\lambda_i$ .

For the voter who receives a payment, consider the case in which there is an interior solution,  $\lambda_i = \lambda_i^*$ . (If a corner solution holds, then the marginal change in  $n$  has no effect.) Then,

applying the Envelope Theorem, the effect of a change in  $n$  on  $\lambda_i$ ,  $\frac{\partial \lambda_i}{\partial n}$ , is given by

$$\begin{aligned} \frac{\partial \lambda_i}{\partial n} &= (-\gamma p) f'(\tau y (\lambda_i - \lambda^e) (N - n) p) \\ &+ \gamma p^2 (N - n)^2 \tau y f''(\tau y (\lambda_i - \lambda^e) (N - n) p) \frac{\partial \lambda_i}{\partial n} \\ &- \gamma p^2 (N - n) (\lambda_i - \lambda^e) \tau y f''(\tau y (\lambda_i - \lambda^e) (N - n) p) \end{aligned} \quad (23)$$

We can re-write  $\frac{\partial \lambda_i}{\partial n}$  as follows.

$$= \frac{f'(\tau y (\lambda_i - \lambda^e) (Np - np)) + p (N - n) \tau y (\lambda_i - \lambda^e) f''(\tau y (\lambda_i - \lambda^e) (Np - np))}{(N - n)^2 p \tau y f''(\tau y (\lambda_i - \lambda^e) (Np - np))} \quad (24)$$

$$= \frac{\frac{1}{\gamma(N-n)p} + p (N - n) \tau y (\lambda_i - \lambda^e) f''(\tau y (\lambda_i - \lambda^e) (Np - np))}{(N - n)^2 p \tau y f''(\tau y (\lambda_i - \lambda^e) (Np - np))} \quad (25)$$

$$= f'(\tau y (\lambda_i - \lambda^e) (Np - np)) \frac{1 + p (N - n) \tau y (\lambda_i - \lambda^e) \frac{f''(\tau y (\lambda_i - \lambda^e) (Np - np))}{f'(\tau y (\lambda_i - \lambda^e) (Np - np))}}{(N - n)^2 p \tau y f''(\tau y (\lambda_i - \lambda^e) (Np - np))} \quad (26)$$

$$= \frac{1}{\gamma (N - n) p} \frac{1 + p (N - n) \tau y (\lambda_i - \lambda^e) \frac{f''(\tau y (\lambda_i - \lambda^e) (Np - np))}{f'(\tau y (\lambda_i - \lambda^e) (Np - np))}}{(N - n)^2 p \tau y f''(\tau y (\lambda_i - \lambda^e) (Np - np))} \quad (27)$$

By assumption,

$$1 + \frac{x f''(x)}{f'(x)} > 0 \quad (28)$$

$$1 + p (N - n) \tau y (\lambda_i - \lambda^e) \frac{f''(\tau y (\lambda_i - \lambda^e) (Np - np))}{f'(\tau y (\lambda_i - \lambda^e) (Np - np))} > 0 \quad (29)$$

$$(30)$$

Accordingly, we can conclude  $\frac{\partial \lambda_i}{\partial n} < 0$ .

#### A.4 Proof of Prediction 3

**(Part 1: Set of thresholds sustainable in equilibrium)** If the politician chooses to expropriate  $\lambda_p \tau Y$ , he derives utility

$$U_p = 0.5y + \lambda_p \tau Y + (1 - \rho) (0.5y + \epsilon) + \eta m (Ny (1 - \lambda_p \tau) + \rho N \kappa y) \quad (31)$$

Since he receives no payment, there is no reciprocal component to his utility function. Thus the politician's preferred expropriation level can be written as follows.

$$\lambda_p^{DEV} = \begin{cases} \lambda & \text{if } 1 > \eta m' (Ny (1 - \lambda \tau) + N \kappa y) \\ \widehat{\lambda}_p & \text{if } 1 \leq \eta m' (Ny (1 - \lambda \tau) + N \kappa y) \end{cases} \quad (32)$$

where  $\widehat{\lambda}_p$  is defined implicitly by

$$1 = \eta m' \left( Ny \left( 1 - \widehat{\lambda}_p \tau \right) + N \kappa y \right) \quad (33)$$

We would like to derive the minimum value  $\lambda^*$  above which a PSNE exists such that the politician expropriates  $\lambda_p \tau Y$  and the voters set threshold  $\lambda_p \tau Y$ . The value  $\lambda^*$  is defined implicitly by the minimum solution to the following equality:

$$\lambda^* \tau Y + \eta m(Ny(1 - \lambda^* \tau)) = -0.5y - \epsilon + \lambda_p^{DEV} \tau Y + \eta m(Ny(1 - \lambda_p^{DEV} \tau - \kappa)) \quad (34)$$

If  $\lambda_p^{DEV} = \lambda$ , then

$$\lambda^* \tau Y + \eta m(Ny(1 - \lambda^* \tau)) = \lambda \tau Y - 0.5y - \epsilon + \eta m(Ny(1 - \lambda \tau - \kappa)) \quad (35)$$

Since  $\eta m(Ny(1 - \lambda \tau - \kappa)) < \eta m(Ny(1 - \lambda^* \tau))$ , it follows from the above equality that  $\lambda^*$  when preferences exhibit altruism is lower than the corresponding value calculated in Proposition 1.

**(Part 2: Voter's choice of expropriation threshold)** If subjects' preferences exhibit both reciprocity and altruism, the utility of voter  $i$  is given by

$$U_i = E_i + \eta m \left( \sum_{j \neq i} E_j \right) + \gamma f \left( \tau Y (\lambda_i - \lambda^e) \left( p_i - \frac{n}{N} p \right) \right) \quad (36)$$

Consider voter  $i$ . Denote by  $n_i$  the the number of payments received by voters other than voter  $i$ . If  $n$  is the total number of payments,  $n_i = n$  if voter  $i$  did not receive a payment ( $p_i = 0$ ), and  $n_i = n - 1$  if voter  $i$  received a payment ( $p_i = p$ ). The welfare maximizing equilibrium for voters is the one in which they choose threshold  $\lambda_i$  such that

$$\begin{aligned} \lambda_i &= \arg \max_{\lambda_i \in [\lambda^*, \lambda]} E_i + \gamma f \left( \tau Y (\lambda_i - \lambda^e) \left( p_i - \frac{n}{N} p \right) \right) \\ &\quad + \eta m(Ny + \epsilon + \lambda_i \tau y N + (N - 1)y (-\lambda_i \tau) + n_i p) \end{aligned} \quad (37)$$

This yields

$$\begin{aligned} \lambda_i &= \arg \max_{\lambda_i \in [\lambda^*, \lambda]} y - \lambda_i \tau y + p_i + \gamma f(\tau y (\lambda_i - \lambda^e) (N p_i - n p)) \\ &\quad + \eta m(\lambda_i \tau y + Ny + \epsilon + n_i p) \end{aligned} \quad (38)$$

Hence

$$\lambda_i = \begin{cases} \lambda^* & \text{if } \gamma (N p_i - n p) f'(\tau y (\lambda^* - \lambda^e) (N p_i - n p)) + \\ & \eta m'(\lambda^* \tau y + \epsilon + Ny + n_i p) < 1 \\ \lambda_i^* & \text{otherwise} \end{cases} \quad (39)$$

where  $\lambda_i^*$  is defined implicitly by

$$1 = \gamma(Np_i - np) f'(\tau y (\lambda_i^* - \lambda^e)(Np_i - np)) + \eta m'(\lambda_i^* \tau y + \epsilon + Ny + n_i p) \quad (40)$$

Consider the case in which  $p_i = 0$ . In this case,

$$\gamma(-np) f'(\tau y (\lambda^* - \lambda^e)(-np)) < 0 \quad (41)$$

If

$$\eta m'(\lambda^* \tau y + \epsilon + Ny + np) < 1 + \gamma np f'(\tau y (\lambda^* - \lambda^e)(-np)), \quad (42)$$

then

$$\lambda_i(p_i = 0) = \lambda^* \quad (43)$$

and otherwise,

$$\lambda_i(p_i = 0) > \lambda^*. \quad (44)$$

Note that the latter case requires

$$\eta m'(\lambda_i \tau y + \epsilon + Ny + np) > 1. \quad (45)$$

Consider now the case when  $p_i = p$ . In this case

$$\gamma(Np - np) f'(\tau y (\lambda_i - \lambda^e)(Np - np)) > 0, \quad (46)$$

and

$$m'(Ny + \lambda_i \tau y + \epsilon + (n - 1)p) > m'(Ny + \lambda_i \tau y + \epsilon + np) \quad (47)$$

due to concavity. Accordingly, we can conclude

$$\lambda_i(p_i = p) \geq \lambda_i(p_i = 0) \quad (48)$$

and

$$\lambda_i(p_i = 0) \leq \lambda_i(\text{nopayments}) \leq \lambda_i(p_i = p) \quad (49)$$

**(Part 3: Effect of increase in number of payments)** For the voter who does not receive a payment, consider first the case in which

$$\lambda_i(p_i = 0) = \lambda^*, \quad (50)$$

and thus  $\eta m'(\lambda_i \tau y + \epsilon + Ny + np)$  is sufficiently small such that

$$\eta m'(\lambda^* \tau y + \epsilon + Ny + np) < 1 + \gamma np f'(\tau y (\lambda^* - \lambda^e)(-np)). \quad (51)$$



We denote this case as **weak altruism**. In this case, the effect of a change in  $n$  is

$$\frac{\partial \lambda_i(p_i = 0)}{\partial n} = \frac{\partial \lambda^*}{\partial n} > 0 \quad (52)$$

Consider now a voter for whom the solution for  $\lambda_i$  is interior, i.e.

$$\eta m'(Ny + \lambda_i \tau y + \epsilon + n_i p) = 1 + \gamma n g f'(\tau y (\lambda_i - \lambda^e) (-np)) \quad (53)$$

We denote this case as **strong altruism**. The effect of a change in  $n$  can be derived applying the Envelope Theorem to the first-order condition for  $\lambda_i^*$ :

$$\begin{aligned} 0 &= -\gamma p f'(\tau y (\lambda_i - \lambda^e) (-ng)) + \gamma n \tau y p^2 f''(\cdot) \left( (\lambda_i - \lambda^e) + n \frac{\partial \lambda_i}{\partial n} \right) \\ &+ \eta m''(\cdot) \left( p + y \tau \frac{\partial \lambda_i}{\partial n} \right) \end{aligned} \quad (54)$$

$$\frac{\partial \lambda_i}{\partial n} = \frac{p \gamma f'(\tau y (\lambda_i - \lambda^e) (-np)) - \gamma n \tau y p f''(\cdot) (\lambda_i - \lambda^e) - \eta m''(\cdot)}{\tau y \gamma n^2 p^2 f''(\cdot) + \eta (N-1) m''(\cdot)} \quad (55)$$

$$\frac{\partial \lambda_i}{\partial n} < 0 \quad (56)$$

For the voter who receives a payment, consider the case in which we have an interior solution, and thus  $\lambda_i = \lambda_i^*$ . In this case:

$$1 = \gamma (Np - np) f'(\tau y (\lambda_i^* - \lambda^e) (Np - np)) + \eta m'(y_p + \lambda_i^* \tau y + \epsilon + (N-1)y + (n-1)p) \quad (57)$$

The effect of a change in  $n$  on  $\lambda_i$  is given by

$$\begin{aligned} &(-1) \gamma p f'(\cdot) - \gamma p^2 (N-n) \tau y (\lambda_i - \lambda^e) \gamma f''(\cdot) + (N-n)^2 p \tau y \gamma f''(\cdot) \frac{\partial \lambda_i}{\partial n} + \eta p m''(\cdot) \\ &+ \eta \tau y m''(\cdot) \frac{\partial \lambda_i}{\partial n} = 0 \end{aligned} \quad (58)$$

$$\frac{\partial \lambda_i}{\partial n} = \frac{\gamma g f'(\cdot) + \gamma p^2 (N-n) \tau y (\lambda_i - \lambda^e) \gamma f''(\cdot) - \eta p m''(\cdot)}{(N-n)^2 p \tau y \gamma f''(\cdot) + \eta \tau y m''(\cdot)} \quad (59)$$

$$= f'(\cdot) \frac{1 + p (N-n) \tau y (\lambda_i - \lambda^e) \frac{f''(\tau y (\lambda_i - \lambda^e) (Np - np))}{f'(\tau y (\lambda_i - \lambda^e) (Np - np))} - \frac{\eta p m''(\cdot)}{f'(\tau y (\lambda_i - \lambda^e) (Np - np))}}{(N-n)^2 p \tau y f''(\tau y (\lambda_i - \lambda^e) (Np - np)) + \eta \tau y m''(\cdot)} \quad (60)$$

$$< 0 \quad (61)$$

Given that by assumption  $1 + \frac{x f''(x)}{f'(x)} > 0$ , we can conclude the following.

$$1 + p (N-n) \tau y (\lambda_i - \lambda^e) \frac{f''(\tau y (\lambda_i - \lambda^e) (Np - np))}{f'(\tau y (\lambda_i - \lambda^e) (Np - np))} > 0 \quad (62)$$

## A.5 Proof of Prediction 4

**(Part 1: Set of thresholds sustainable in equilibrium)** If the politician chooses to expropriate  $\lambda_p \tau Y$ , he derives utility

$$U_p = 0.5y + \lambda_p \tau N y + (1 - \rho)(0.5y + \epsilon) - \alpha h(0.5y + \lambda_p \tau N y + (1 - \rho)(0.5y + \epsilon) - ((1 - \tau)y + (1 - \lambda_p)\tau y - \rho \kappa y)) \quad (63)$$

This can be simplified to

$$U_p = 0.5y + \lambda_p \tau N y + (1 - \rho)(0.5y + \epsilon) - \alpha h(\lambda_p \tau (N + 1)y + \epsilon - \rho(0.5y + \epsilon) + \rho \kappa y) \quad (64)$$

Consider the case in which  $\rho = 1$  (i.e., the politician fails to be reelected). Then, the politician's payoff is higher than the voter's when the following condition holds.

$$0.5y + \lambda_p \tau Y > (1 - \tau)y + (1 - \lambda_p)\tau y - \kappa y \quad (65)$$

$$\lambda_p > \frac{y(1 - \tau - \kappa) + \tau y - 0.5y_p}{\tau y (N + 1)} = \frac{y(1 - \kappa) - 0.5y_p}{\tau y (N + 1)} \quad (66)$$

In this case, the first-order condition for  $\lambda_p$  in the politician's problem is given by

$$N - (N + 1) \cdot \alpha \cdot h'(\lambda_p \tau (N + 1)y + \epsilon - (0.5y + \epsilon) + \kappa y) \leq 0 \quad (67)$$

If

$$\alpha h'(\lambda \tau (N + 1)y - 0.5y + \kappa y) < \frac{N}{N + 1} \quad (68)$$

then the politician's choice of expropriation threshold can be written as follows

$$\lambda_p^* = \lambda > \frac{0.5 - \kappa}{\tau (N + 1)} \quad (69)$$

Now, consider the case in which  $\rho = 0$  (the politician is re-elected). Then, the politician's payoff is higher than the voters' when the following condition holds.

$$y_p + \epsilon + \lambda_p \tau N y > (1 - \tau)y + (1 - \lambda_p)\tau y \quad (70)$$

$$\lambda_p > \frac{(1 - \tau)y + \tau y - y - \epsilon}{\tau y (N + 1)} = \frac{-\epsilon}{\tau y (N + 1)} \quad (71)$$

Since  $y_v = y = y_p$ , the politician's payoff is always higher than the voters' payoff.

To characterize the optimal level  $\lambda^*$ , two cases must be considered.

- If  $h'(\lambda \tau (N + 1)y - 0.5y + \kappa y) \leq \frac{N}{(N + 1)\alpha}$ , then the politician's preferred expropriation in case of failing to win reelection is  $\lambda$ . In this case, if the voters set the threshold  $\lambda^* > 0$ ,

and the politician expropriates exactly  $\lambda^*$ , he obtains utility:

$$U_p = y + \lambda^* \tau N y + \epsilon - \alpha h(\lambda^* \tau (N + 1) y + \epsilon) \quad (72)$$

However, if the politician deviates, he obtains utility

$$0.5y + \lambda \tau N y - \alpha h(\lambda \tau (N + 1) y - 0.5y + \kappa y) \quad (73)$$

Therefore, the value of  $\lambda^*$  is defined implicitly by

$$\begin{aligned} \lambda^* \tau N y - \alpha h(\lambda^* \tau (N + 1) y + \epsilon) &= \lambda \tau N y - 0.5y - \epsilon \\ &\quad - \alpha h(\lambda \tau (N + 1) y - 0.5y + \kappa y). \end{aligned} \quad (74)$$

- If  $h'(\lambda \tau (N + 1) y - 0.5y + \kappa y) > \frac{N}{(N+1)\alpha}$ , then there exists a  $\lambda_{\max}^* < \lambda$  such that the politician's preferred expropriation is  $\lambda_{\max}^*$ , where  $\lambda_{\max}^*$  is given by:

$$h'(\lambda_{\max}^* \tau (N + 1) y - 0.5y + \kappa y) = \frac{N}{\alpha (N + 1)}. \quad (75)$$

In this case, the value of  $\lambda^*$  is defined implicitly by

$$\begin{aligned} \lambda^* \tau N y - \alpha h(\lambda^* \tau (N + 1) y + \epsilon) &= \lambda_{\max}^* \tau N y - 0.5y - \epsilon \\ &\quad - \alpha h(\lambda_{\max}^* \tau (N + 1) y - 0.5y + \kappa y) \end{aligned} \quad (76)$$

**(Part 2: Voter's choice of expropriation threshold)** The utility of voter  $i$  is given by

$$U_i = \max E_i - \alpha \cdot h \left( \left| E_p - \frac{1}{N} \sum_j E_j \right| \right) + \gamma \cdot f \left( \tau y N (\lambda_i - \lambda^e) \left( p_i - \frac{n}{N} p \right) \right). \quad (77)$$

If the politician wins reelection, then the voters' earnings are below the average, and  $\lambda^*$  is derived from equation (74). Voter  $i$ 's preferred level of expropriation is then given by:

$$\begin{aligned} \lambda_i &= \arg \max_{\lambda_i \in [\lambda^*, \lambda]} y (1 - \lambda_i \tau) + p_i - \alpha \cdot h \left( \epsilon + (N + 1) \lambda_i \tau y - \frac{n}{N} p \right) \\ &\quad + \gamma \cdot f \left( \tau y N (\lambda_i - \lambda^e) \left( p_i - \frac{n}{N} p \right) \right). \end{aligned} \quad (78)$$

The first-order condition for an internal solution for  $\lambda_i$  can be written as follows.

$$\begin{aligned} -1 - (N + 1) \alpha h' \left( \epsilon + (N + 1) \lambda_p \tau y - \frac{n}{N} p \right) \\ + \gamma (N p_i - n p) f'(\tau y (\lambda_i - \lambda^e) (N p_i - n p)) = 0. \end{aligned} \quad (79)$$

If  $p_i = 0$ , the first-order condition is

$$\begin{aligned} & -1 - \alpha(N+1)h' \left( \epsilon + (N+1)\lambda_i\tau y - \frac{n}{N}p \right) \\ & + \gamma(-np)f'(\tau y(\lambda_i - \lambda^e)(-np)) < 0. \end{aligned} \quad (80)$$

Since the left-hand side is always negative, it follows that

$$\lambda_i(p_i = 0) = \lambda^*. \quad (81)$$

If  $p_i = p$ , the first-order condition is

$$-1 - (N+1)\alpha h' \left( \epsilon + (N+1)\lambda_i\tau y - \frac{n}{N}p \right) + \gamma(N-n)pf'(\tau y(\lambda_i - \lambda^e)(N-n)p) \leq 0. \quad (82)$$

Accordingly, we can conclude that  $\lambda_i(p_i = p) \geq \lambda_i(p_i = 0)$ , with strict inequality when the following condition holds.

$$1 + (N+1)\alpha h' \left( \epsilon + (N+1)\lambda_i\tau y - \frac{n}{N}p \right) = \gamma(N-n)pf'(\tau y(\lambda_i - \lambda^e)(N-n)p). \quad (83)$$

**(Part 3: Effect of increase in number of payments)** If  $n$  voters receive a payment, then the value  $\lambda^*$  changes as follows:

- If  $h'(\lambda\tau(N+1)y - 0.5y + \kappa y) \leq \frac{N}{(N+1)\alpha}$ , then

$$\frac{\partial \lambda^*}{\partial n} = \frac{\alpha \frac{p}{N} \left( h'(\lambda\tau(N+1)y - 0.5y + \kappa y - \frac{np}{N}) - h'(\lambda^*\tau(N+1)y + \epsilon - \frac{np}{N}) \right)}{\tau Ny \left( 1 - \frac{\alpha(N+1)}{N} \cdot h'(\lambda^*\tau(N+1)y + \epsilon - \frac{np}{N}) \right)} \quad (84)$$

This implies  $\frac{\partial \lambda^*}{\partial n} > 0$ .

- If  $h'(\lambda\tau(N+1)y - 0.5y + \kappa y) > \frac{N}{(N+1)\alpha}$ , then applying the Envelope Theorem, we obtain  $\frac{\partial \lambda^*}{\partial n} > 0$  as above.

If the voter receives no payment,  $p_i = 0$  and  $\lambda_i(p_i = 0) = \lambda^*$ . From the previous results,  $\lambda^*$  increases in  $n$ . If the voter receives a payment,  $p_i = p$  and applying the Envelope Theorem in (79),

$$\begin{aligned} & \gamma(-1)pf'(\tau y(\lambda_i - \lambda^e)(N-n)p) \\ & - \gamma\tau y(\lambda_i - \lambda^e)(N-n)p^2f''(\tau y(\lambda_i - \lambda^e)(N-n)p) \\ & + \gamma\tau y(N-n)^2p^2f''(\tau y(\lambda_i - \lambda^e)(N-n)p) \frac{\partial \lambda_p}{\partial n} \\ & - \alpha(N+1) \left( (N+1)\tau y \frac{\partial \lambda_i}{\partial n} - \frac{p}{N} \right) h' \left( (N+1)\lambda_i\tau y + \epsilon - \frac{n}{N}p \right) = 0 \end{aligned} \quad (85)$$

$$\frac{\partial \lambda_i}{\partial n} = \frac{p}{\tau y} \frac{\gamma(f'(x_i) + x_i f''(x_i)) - \alpha \frac{N+1}{N} h''(a_i)}{\gamma(N-n)^2 p^2 f''(x_i) - \alpha(N+1)^2 h''(a_i)} \quad (86)$$

where

$$a_i = (N + 1) \lambda_i \tau y + \epsilon - \frac{n}{N} p \quad (87)$$

$$x_i = \tau y (\lambda_i - \lambda^e) (N - n) p \quad (88)$$

By assumption,  $f'(x_i) + x_i f''(x_i) > 0$ . Since  $h''(a_i) > 0$ , this implies that

$$\frac{\partial \lambda_i}{\partial n} < 0 \text{ if } \gamma (f'(x_i) + x_i f''(x_i)) > \alpha \frac{N+1}{N} h''(a_i) \quad (89)$$

and

$$\frac{\partial \lambda_i}{\partial n} > 0 \text{ if } \gamma (f'(x_i) + x_i f''(x_i)) < \alpha \frac{N+1}{N} h''(a_i) \quad (90)$$

Accordingly,  $\frac{\partial \lambda_i}{\partial n} > 0$  if the reciprocity effect (the reduced benefit of offering a higher threshold to the politician) is smaller than the inequality aversion effect (the reduced cost of a lower level of inequality).

## A.6 Proof of Prediction 5

**(Part 1: Set of thresholds sustainable in equilibrium)** The politician does not receive a payment, and therefore he does not act reciprocally. His preferences take the form:

$$U_p = \max E_p + \eta \cdot m \left( \sum_{i=1}^N E_i \right) - \alpha \cdot h \left( \left| E_p - \frac{1}{N} \sum_{i=1}^N E_i \right| \right) \quad (91)$$

that is, he derives utility from his own earnings and disutility from inequality (how much his earnings deviate from the mean voter income).

If he chooses to expropriate  $\lambda_p \tau Y$ , the politician derives utility

$$U_p = 0.5y + \lambda_p \tau Y + (1 - \rho) (0.5y + \epsilon) + \eta m (Ny (1 - \lambda_p \tau - \rho \kappa) + np) - \alpha h \left( \left| 0.5y + \lambda_p \tau Ny + (1 - \rho) (0.5y + \epsilon) - \left( (1 - \lambda_p \tau - \rho \kappa) y + \frac{n}{N} p \right) \right| \right) \quad (92)$$

**(Part 1a: Politician's expropriation if he fails to win reelection)** Consider the case in which  $\rho = 1$  (i.e., the politician fails to win reelection). Then, the politician's payoff is higher than the average payoff of voters whenever the following conditions hold — in other words, whenever his level of expropriation is sufficiently high.

$$\begin{aligned} 0.5y + \lambda_p \tau Y &> (1 - \lambda_p \tau - \kappa) y + \frac{n}{N} p \\ \lambda_p &\geq \underline{\lambda}_p = \frac{(1 - \kappa) y + \frac{n}{N} p - 0.5y}{\tau y (N + 1)} \end{aligned} \quad (93)$$

In this case, the politician's utility is maximized at expropriation level  $\lambda_p^{DEV}$  such that

$$\begin{aligned} & \tau Y - \eta \tau Y m' (Ny (1 - \lambda_p^{DEV} \tau - \rho \kappa) + np) \\ & - \alpha h' \left( \left| 0.5y + \lambda_p^{DEV} \tau Y - \left( (1 - \lambda_p^{DEV} \tau - \kappa) \frac{Y}{N} + \frac{n}{N} p \right) \right| \right) \tau Y \left( 1 + \frac{1}{N} \right) = 0 \end{aligned} \quad (94)$$

This can be rewritten as follows.

$$\begin{aligned} & 1 - \eta m' (N (1 - \lambda_p \tau - \rho \kappa) y + np) = \\ & \alpha \frac{N+1}{N} h' \left( \frac{N+1}{N} \tau Y \lambda_p^{DEV} + 0.5y - \left( (1 - \kappa) y + \frac{n}{N} p \right) \right) \end{aligned} \quad (95)$$

If  $\lambda_p^{DEV} \geq \underline{\lambda}_p$ , then the most profitable deviation for the politician would be choose  $\lambda_p^{DEV} \in [\underline{\lambda}_p, \lambda]$ . The value  $\lambda_p^{DEV} = \lambda$  if

$$\begin{aligned} & T - \eta T m' (Ny (1 - \lambda \tau - \rho \kappa) + np) \\ & - \alpha h' \left( \left| 0.5y + \lambda \tau Y - \left( (1 - \lambda \tau - \kappa) y + \frac{n}{N} p \right) \right| \right) \tau y (N+1) > 0 \end{aligned} \quad (96)$$

**(Part 1b: Politician's expropriation if he wins reelection)** Now, consider the case in which  $\rho = 0$  (i.e., the politician wins reelection). Then, the politician's payoff is always higher than the average payoff of voters. The politician's utility is maximized at  $\lambda_p^{RE}$  (denoting reelection) such that

$$1 - \eta m' (N (1 - \lambda_p^{KEPT} \tau - \rho \kappa) y + np) = \alpha \frac{N+1}{N} h' \left( \frac{N+1}{N} \tau Y \lambda_p^{RE} + y + \epsilon - \frac{1}{N} (Y + np) \right). \quad (97)$$

If  $\kappa \frac{Y}{N} < 0.5y_p + \epsilon$  (as in the experiment), then  $\lambda_p^{RE} < \lambda_p^{DEV}$ .

**(Part 1c: Determining the minimum threshold sustainable in equilibrium)**

Consider the minimum value of  $\lambda^*$  at which the politician would not be replaced, and a deviation with replacement would not be profitable. This is defined implicitly by the minimum of the set of solutions to:

$$\begin{aligned} & y_p + \lambda^* \tau Y + \epsilon + \eta m (N (1 - \lambda^* \tau - \rho \kappa) y + np) \\ & - \alpha h \left( y_p + \frac{N+1}{N} \lambda^* \tau Y + \epsilon - \frac{1}{N} (Y + np) \right) \\ & 0.5y + \lambda_p^{DEV} \tau Y + \eta m (N (1 - \lambda_p^{DEV} \tau - \rho \kappa) y + np) \\ & - \alpha h \left( 0.5y + \frac{N+1}{N} \lambda_p^{DEV} \tau Y - \frac{1}{N} ((1 - \kappa) Y + np) \right) \end{aligned} \quad (98)$$

To characterize the set of PSNE, we need to compare  $\lambda^*$  and  $\lambda_p^{KEPT}$ . Since the politician's

utility with reelection is maximized at  $\lambda_p^{KEPT}$ , we know that

$$u_p(\lambda^*|\rho=0) \leq u_p(\lambda_p^{KEPT}|\rho=0) \quad (99)$$

Notice that, given the strict concavity of  $U_p$ , with an interior  $\lambda_p^{KEPT}$ , the solution to equation (98) may not be unique: there exists an interval  $[\lambda_p^l, \lambda_p^r]$ , with  $\lambda_p^l \leq \lambda_p^{KEPT} \leq \lambda_p^r$  such that the politician would not find it profitable to deviate whenever  $\lambda_p \in [\lambda_p^l, \lambda_p^r]$ . However, if the politician is reelected and has the ability to choose  $\lambda_p^{KEPT}$ , the politician will choose  $\lambda_p^{KEPT}$ . Thus for values  $\lambda_p \geq \lambda_p^r$ , the politician would deviate. Hence, we can conclude that  $\lambda^* = \lambda_p^l$ , and  $\lambda^* < \lambda_p^{KEPT}$ .

**(Part 2: Effect of increasing  $n$  on the set of thresholds sustainable in equilibrium)**

Consider the change in  $n$  in equation (98):

$$\frac{\partial \lambda^*}{\partial n} = \frac{\frac{\partial \lambda_p^{DEV}}{\partial n} \tau Y (1 - \alpha \frac{N+1}{N} h'(W) - \eta m'(Z_D)) + \alpha [h'(W) - h'(X)] \frac{p}{N} + \eta N [m'(Z_D) - m'(Z_P)]}{\tau Y (1 - \alpha \frac{N+1}{N} h'(X) - \eta m'(Z_P))} \quad (100)$$

We define the following variables.

$$W = \left( (N+1) \tau y \lambda_p^{DEV} + 0.5y - \left( (1-\kappa)y + \frac{n}{N}p \right) \right) \quad (101)$$

$$X = y + (N+1) \lambda^* \tau y + \epsilon - \left( y + \frac{n}{N}p \right) \quad (102)$$

$$Z_D = Ny (1 - \lambda_p^{DEV} \tau - \rho \kappa) + np \quad (103)$$

$$Z_P = Ny (1 - \lambda^* \tau - \rho \kappa) + np \quad (104)$$

We can note that  $Z_D < Z_P$ ,  $m'(Z_D) - m'(Z_P) > 0$

Notice that, from (95),

$$1 - \eta m'(Z_D) - \alpha \frac{N+1}{N} h'(W) = 0 \quad (105)$$

In addition, from  $\lambda^* < \lambda_p^{RE}$  and equation (97),

$$1 - \eta m'(Z_P) - \alpha \frac{N+1}{N} h'(X) > 0 \quad (106)$$

This yields

$$\frac{\partial \lambda^*}{\partial n} = \frac{\frac{p}{N} (1 - \alpha \frac{N+1}{N} h'(X) - \eta m'(Z_D))}{\tau Y (1 - \alpha \frac{N+1}{N} h'(X) - \eta m'(Z_P))} \quad (107)$$

$$\frac{\partial \lambda^*}{\partial n} > 0 \quad (108)$$

**(Part 3: Voter's choice of expropriation threshold)**

The utility of voter  $i$  when the expropriation fraction is  $\lambda_p$  can be written as follows.

$$U_i = \max E_i + \eta m \left( E_p + (N-1) \sum_{j \neq i} E_j \right) - \alpha \cdot h \left( \left| E_p - \frac{1}{N} \sum_{j=1}^N E_j \right| \right) + \gamma \cdot f \left( \tau y N (\lambda_p - \lambda^e) \left( p_i - \frac{n}{N} p \right) \right) \quad (109)$$

Denote by  $n_i$  the number of payments given to other voters than voter  $i$ . Thus  $n_i = n$  if  $p_i = 0$  and  $n_i = n - 1$  if  $p_i = p$ . If the politician is reelected, then the voters' earnings are below the average. Voter  $i$ 's preferred level of expropriation is then given by:

$$\lambda_i = \arg \max_{\lambda_p \in [\lambda^*, \lambda]} y(1 - \lambda_p \tau) + p_i + \eta m(Ny + \lambda_p \tau y + \epsilon + n_i p) - \alpha \cdot h \left( y + \epsilon + \frac{N+1}{N} \lambda_p \tau Y - y - \frac{n}{N} p \right) + \gamma \cdot f \left( \tau y N (\lambda_p - \lambda^e) \left( p_i - \frac{n}{N} p \right) \right) \quad (110)$$

Accordingly, the first-order condition for an internal solution for  $\lambda_i$  is as follows.

$$-1 + \eta m' (Ny + \lambda_p \tau y + \epsilon + n_i p) - \alpha (N+1) h' \left( \epsilon + \frac{N+1}{N} \lambda_p \tau Y - \frac{n}{N} p \right) + \gamma (N p_i - n p) f' (\tau y (\lambda_p - \lambda^e) (N p_i - n p)) = 0 \quad (111)$$

If  $p_i = 0$ , the first-order condition is

$$-1 + \eta m' (Ny + \lambda_p \tau y + \epsilon + n p) - \alpha (N+1) h' \left( \epsilon + \frac{N+1}{N} \lambda_p \tau Y - \frac{n}{N} p \right) + \gamma (-n p) f' (\tau y (\lambda_p - \lambda^e) (-n p)) \leq 0 \quad (112)$$

Since

$$\gamma (-n p) f' (\tau y (\lambda_p - \lambda^e) (-n p)) < 0 \quad (113)$$

if  $\eta m' (Ny + \lambda_p \tau y + \epsilon + n_i p)$  is sufficiently high, then  $\lambda_i(p_i = 0) > \lambda^*$ . Otherwise,  $\lambda_i(p_i = 0) = \lambda^*$ .

If  $p_i = p$ , the first-order condition is

$$-1 + \eta m' (Ny + \lambda_p \tau y + \epsilon + n p - p) - \alpha (N+1) h' \left( \epsilon + \frac{N+1}{N} \lambda_p \tau Y - \frac{n}{N} p \right) + \gamma (-n p) f' (\tau y (\lambda_p - \lambda^e) (-n p)) \leq 0 \quad (114)$$



Then,  $\lambda_i(p_i = p) \geq \lambda^*$ , holding with strict inequality when the following condition holds.

$$\begin{aligned} & -1 + \eta m' (Ny + \lambda_p \tau y + \epsilon + np - p) \\ & - \alpha (N + 1) h' \left( \epsilon + \frac{N + 1}{N} \lambda_p \tau Y - \frac{n}{N} p \right) \\ & + \gamma (N - n) p f' (\tau y (\lambda_p - \lambda^e) (N - n) p) = 0 \end{aligned} \quad (115)$$

Since

$$m' (Ny + \lambda_p \tau y + \epsilon + np - p) > m' (Ny + \lambda_p \tau y + \epsilon + np) \quad (116)$$

and

$$\gamma (N - n) g f' (\tau y (\lambda_p - \lambda^e) (N - n) p) > 0 > \gamma (-np) f' (\tau y (\lambda_p - \lambda^e) (-np)) \quad (117)$$

it follows that

$$\lambda_i(p_i = p) \geq \lambda_i(p_i = 0) \geq \lambda^* \quad (118)$$

#### (Part 4: Effect of increase in number of payments)

If  $p_i = p$ , and the reciprocity or altruism effects are of sufficient magnitude,  $\lambda_i(p_i = p) > \lambda^*$ .

The first-order condition for  $\lambda_i$  is

$$\begin{aligned} & -1 + \eta m' (Ny + \lambda_i \tau y + \epsilon + (n - 1)p) - \alpha (N + 1) h' \left( \epsilon + (N + 1) \lambda_i \tau y - \frac{n}{N} p \right) \\ & + \gamma (Np - np) f' (\tau y (\lambda_i - \lambda^e) (Np - np)) = 0 \end{aligned} \quad (119)$$

Applying the Envelope Theorem yields

$$\frac{\partial \lambda_i}{\partial n} = \frac{p}{\tau y \gamma (N - n)^2 p^2 f'' (x_i) + \eta m'' (b_i) - \alpha (N + 1)^2 \lambda_p h'' (a_i)} \left( \gamma f' (x_i) + \gamma x_i f'' (x_i) - \eta m'' (b_i) - \alpha \frac{N + 1}{N} h'' (a_i) \right) \quad (120)$$

where

$$x_i = \tau y (\lambda_i - \lambda^e) (N - n) p \quad (121)$$

$$b_i = Ny + \lambda_i \tau y + \epsilon + np - p \quad (122)$$

By assumption,  $f' (x_i) + x_i f'' (x_i) > 0$ . Since  $h'' (a_i) > 0$  this implies that

$$\frac{\partial \lambda_i}{\partial n} < 0 \text{ if } \gamma (f' (x_i) + x_i f'' (x_i)) - \eta m'' (b_i) > \alpha \frac{N + 1}{N} h'' (a_i) \quad (123)$$

and

$$\frac{\partial \lambda_i}{\partial n} > 0 \text{ if } \gamma (f' (x_i) + x_i f'' (x_i)) - \eta m'' (b_i) < \alpha \frac{N + 1}{N} h'' (a_i) \quad (124)$$

Given **weak altruism**, the voter who does not receive a payment chooses  $\lambda_i(p_i = 0) = \lambda^*$ .

Then,

$$\frac{\partial \lambda_i(p_i = 0)}{\partial n} = \frac{\partial \lambda^*}{\partial n} > 0. \quad (125)$$

Given **strong altruism**, if the voter receives no payment,  $p_i = 0$ , and

$$1 + \alpha(N+1)h' \left( \epsilon + (N+1)\lambda_i\tau y - \frac{n}{N}p \right) + \gamma n p f'(\tau y(\lambda_i - \lambda^e)(-np)) = \eta m'(Ny + \lambda_p \tau y + \epsilon + np) \quad (126)$$

Applying the Envelope Theorem,

$$\eta p m''(\cdot) + \eta \tau y m''(\cdot) \frac{\partial \lambda_i}{\partial n} + \alpha(N+1) \frac{p}{N} h''(\cdot) - \alpha(N+1)^2 \lambda_p \tau y h''(\cdot) \frac{\partial \lambda_i}{\partial n} + \gamma \tau y (\lambda^V - \lambda^e) n p^2 f''(\cdot) + \gamma \tau y n^2 p^2 f''(\cdot) \frac{\partial \lambda_i}{\partial n} - \gamma p f'(\cdot) = 0 \quad (127)$$

Thus

$$\frac{\partial \lambda_i(p_i = 0)}{\partial n} = \frac{p \gamma f'(x_{i0}) + \gamma x_{i0} f''(x_{i0}) - \eta m''(b_{i0}) - \alpha \frac{N+1}{N} h''(a_i)}{\tau y \gamma n^2 p^2 f''(x_{i0}) + \eta m''(b_{i0}) - \alpha(N+1)^2 \lambda_i h''(a_i)} \quad (128)$$

where

$$a_i = (N+1)\lambda_i\tau y + \epsilon - \frac{n}{N}p \quad (129)$$

$$x_{i0} = \tau y(\lambda_i - \lambda^e)(-n)p \quad (130)$$

$$b_{i0} = Ny + \lambda_i\tau y + \epsilon + np \quad (131)$$

Then,

$$\frac{\partial \lambda_i(p_i = 0)}{\partial n} < 0 \text{ if } \gamma(f'(x_{i0}) + x_{i0}f''(x_{i0})) - \eta m''(b_{i0}) > \alpha \frac{N+1}{N} h''(a_i) \quad (132)$$

and

$$\frac{\partial \lambda_i(p_i = 0)}{\partial n} > 0 \text{ if } \gamma(f'(x_{i0}) + x_{i0}f''(x_{i0})) - \eta m''(b_{i0}) < \alpha \frac{N+1}{N} h''(a_i) \quad (133)$$

### (Part 5: Existence of functions such that responses to increasing $n$ diverge)

Since  $x_{i0} < x_i$ , it follows that  $f'(x_{i0}) > f'(x_i)$ . Thus for any functions  $m(\cdot)$  and  $h(\cdot)$ , there exists function  $f(\cdot)$  such that

$$\gamma(f'(x_{i0}) + x_{i0}f''(x_{i0})) - \eta m''(b_{i0}) > \alpha \frac{N+1}{N} h''(a_i) > \gamma(f'(x_i) + x_i f''(x_i)) - \eta m''(b_i) \quad (134)$$

and so

$$\frac{\partial \lambda_i(p_i = 0)}{\partial n} < 0 \text{ and } \frac{\partial \lambda_i(p_i = p)}{\partial n} > 0 \quad (135)$$

Note that  $\frac{\partial \lambda_i}{\partial n} > 0$  if the reciprocity effect and the altruism effect are jointly smaller in magnitude than the inequality aversion effect (the reduced cost of lower levels of inequality).

## A.7 Proof of Prediction 7

We can demonstrate the result by considering an example. Consider a polity with  $N = 3$  voters who vote retrospectively. Each voter chooses to reelect the incumbent if his utility  $U_i$  from reelection is higher than some benchmark  $\underline{U}_i$ , where  $\underline{U}_1 < \underline{U}_2 < \underline{U}_3$ . This is equivalent to

a valence parameter that varies across voters. Each voter's utility when the politician extracts  $\lambda_p$  and remains in office is given by

$$U_i = E_i + p_i + \gamma f(\tau y N (\lambda_p - \lambda^e) (p_i - p^e)) + \eta m \left( \sum_{j \neq i} E_j \right) - \alpha \cdot h \left( \left| E_p - \frac{1}{N} \sum_{j=1}^N E_j \right| \right) \quad (136)$$

where

$$E_i = (1 - \tau) \cdot y_i + (1 - \lambda_p) \cdot \tau \quad (137)$$

and

$$E_p = y + \epsilon + \lambda_p \cdot \tau \cdot N \quad (138)$$

First, without any payments, utility in the case of reelection can be written as

$$U_i = E_i + \eta m \left( \sum_{j \neq i} E_j \right) - \alpha \cdot h \left( \left| E_p - \frac{1}{N} \sum_{j=1}^N E_j \right| \right) \quad (139)$$

Thus, we can conclude

$$U_i = U = y(1 - \lambda_p \tau) + \eta \cdot m(Ny + \epsilon + \lambda_p \tau y) - \alpha \cdot h((N + 1)\lambda_p \tau y + \epsilon). \quad (140)$$

Assume that, without any payments  $\underline{U}_1 < U < \underline{U}_2 < \underline{U}_3$ .

**(Part 1: Vote-buying with individual targeting)** The politician has a fixed budget  $P = p$  to use for vote buying. With individual targeting, the politician can make a payment  $p$  to voter 2 to ensure that this voter is at least indifferent between the utility from reelecting the politician and the outside option. However, voter 1 responds to the payment as well due to the reciprocal function  $f(\cdot)$ , yielding a new level of utility in case of reelection.

$$\begin{aligned} U_1^{new} &= y(1 - \lambda_p \tau) + \eta \cdot m(Ny + \epsilon + \lambda_p \tau y) - \alpha \cdot h((N + 1)\lambda_p \tau y + \epsilon) \\ &\quad + \gamma f\left(\tau y N (\lambda_p - \lambda^e) \left(-\frac{p}{N}\right)\right). \end{aligned} \quad (141)$$

If  $U_1^{new} < \underline{U}_1$ , then the politician fails to win reelection due to the backlash from voter 1.

Let  $\lambda_p^{ind}$  be the maximum value of the expropriation fraction that the politician can choose in equilibrium such that, with the payment  $p$ , voter 2 is indifferent between reelecting the politician or not. If  $p$  is paid to voter 2 only (individual targeting), such that  $U_2(\lambda_p^{ind}) = \underline{U}_2$ ,

$$\begin{aligned} p - \alpha \cdot h\left((N + 1)\lambda_p^{ind} \tau y + \epsilon - \frac{p}{N}\right) + \alpha \cdot h\left((N + 1)\lambda_p^{ind} \tau y + \epsilon\right) \\ + \gamma f\left(\tau y N (\lambda_p^{ind} - \lambda^e) \left(p - \frac{p}{N}\right)\right) = \underline{U}_2 - U. \end{aligned} \quad (142)$$

**(Part 2: Vote-buying with community targeting)**

With community-level targeting, the budget  $P$  is split among multiple voters. If  $\frac{p}{2}$  is paid to voters 1 and 2 instead (community targeting), and the politician expropriates  $\lambda_p$ , with  $\rho = 0$ , voters 1 and 2 each receive utility

$$U_i \left( \lambda_p; \frac{p}{2} \right) = U + \frac{p}{2} - \alpha \cdot h \left( (N+1)\lambda_p \tau y + \epsilon - \frac{p}{N} \right) + \alpha \cdot h \left( (N+1)\lambda_p \tau y + \epsilon \right) \\ + \gamma f \left( \tau y N (\lambda_p - \lambda^e) \left( \frac{p}{2} - \frac{p}{N} \right) \right) + \eta m \left( N y + \epsilon + \lambda_p \tau y + \frac{p}{2} \right) - \eta m \left( N y + \epsilon + \lambda_p \tau y \right) \quad (143)$$

Let  $\lambda_p^*$  be the value of  $\lambda_p$  at which the above expression equals  $\underline{U}_2$ .

**(Part 3: Comparing individual and community targeting)**

Consider a politician who expropriates  $\lambda_p^{ind}$ . Then

$$U_i \left( \lambda_p^{ind}; \frac{p}{2} \right) - U_2(\lambda_p^{ind}) = \alpha \cdot \left[ h \left( (N+1)\lambda_p^{ind} \tau y + \epsilon - \frac{p}{N} \right) - h \left( (N+1)\lambda_p^{ind} \tau y + \epsilon - \frac{p}{N} \right) \right] \\ - \alpha \cdot \left[ h \left( (N+1)\lambda_p^{ind} \tau y + \epsilon \right) - h \left( (N+1)\lambda_p^{ind} \tau y + \epsilon \right) \right] \\ + \gamma \cdot \left[ f \left( \tau y N (\lambda_p^{ind} - \lambda^e) \left( \frac{p}{2} - \frac{p}{N} \right) \right) - f \left( \tau y N (\lambda_p^{ind} - \lambda^e) \left( p - \frac{p}{N} \right) \right) \right] \\ + \eta \cdot \left[ m \left( N y + \epsilon + \lambda_p^{ind} \tau y + \frac{p}{2} \right) - m \left( N y + \epsilon + \lambda_p^{ind} \tau y \right) \right] - \frac{p}{2}. \quad (144)$$

This can be re-written as follows.

$$U_i \left( \lambda_p^{ind}; \frac{p}{2} \right) - U_2(\lambda_p^{ind}) = \\ \gamma \cdot \left[ f \left( \tau y N (\lambda_p^{ind} - \lambda^e) \left( \frac{p}{2} - \frac{p}{N} \right) \right) - f \left( \tau y N (\lambda_p^{ind} - \lambda^e) \left( p - \frac{p}{N} \right) \right) \right] \\ + \eta \cdot \left[ m \left( N y + \epsilon + \lambda_p^{ind} \tau y + \frac{p}{2} \right) - m \left( N y + \epsilon + \lambda_p^{ind} \tau y \right) \right] - \frac{p}{2}. \quad (145)$$

If  $U_i \left( \lambda_p^{ind}; \frac{p}{2} \right) - U_2(\lambda_p^{ind}) > \underline{U}_2$ , then  $U_i \left( \lambda_p^{ind}; \frac{p}{2} \right) > \underline{U}_2$ , and the politician can increase  $\lambda_p$  above  $\lambda_p^{ind}$ . For a very small value of  $p$ , this condition requires that the voters exhibit sufficiently strong altruism:

$$\eta \cdot m' \left( N y + \epsilon + \lambda_p^{ind} \tau y + \frac{p}{2} \right) > 1 + \gamma \tau y \cdot \left( \lambda_p^{ind} - \lambda^e \right) \cdot f' \left( \tau y N (\lambda_p^{ind} - \lambda^e) \left( \frac{p}{2} - \frac{p}{N} \right) \right) \quad (146)$$

Thus, when the marginal utility from altruism is sufficiently large, we conclude that the politician can expropriate more and still win reelection when payments are distributed to two voters instead of just one voter.

**A.8 Proof of Prediction 8**

The first order condition with respect to  $\lambda$  leads to an expression in which the term

$$\gamma (N - n) g f' (\tau y (\lambda_i - \lambda^e) (N - n) p) \quad (147)$$

enters additively. Applying the Envelope Theorem, it follows that an increase in  $\gamma$  leads to an increase in  $\lambda_i$ , given the concavity of the  $f(\cdot)$  function.

### A.9 Proof of Prediction 9

A higher value of  $\lambda$  increases the politician's income in case of deviation. Thus, the minimum value  $\lambda^*$  that can be sustained in equilibrium (weakly) decreases. This follows from applying the Envelope Theorem to the condition for determining  $\lambda^*$ .

### A.10 Proof of Prediction 10

With altruism and inequality aversion (reciprocity is not relevant, since there are no payments), the maximization problem for voter  $i$  is:

$$\begin{aligned} \lambda_i = \arg \max_{\lambda_p \in [\lambda^*, \lambda]} & y_i - \lambda_p \tau y + \eta m \left( y + \lambda_p \tau y + \epsilon + \sum_{j \neq i} y_j \right) \\ & - \alpha \cdot h \left( y + \epsilon + (N + 1) \lambda_p \tau y - \sum_j y_j \right) \end{aligned} \quad (148)$$

Notice that all voters still pay the same tax, regardless of their endowment.

With weak altruism,

$$\eta m' \left( y + \sum_{j \neq i} y_j + \lambda_p \tau y + \epsilon \right) < 1 \quad (149)$$

Thus the first-order condition for  $\lambda_i$  is

$$\begin{aligned} -1 - \alpha \cdot (N + 1) \cdot h' \left( y + \epsilon + (N + 1) \lambda_p \tau y - \frac{\sum_j y_j}{N} \right) \\ + \eta m \left( y + \sum_{j \neq i} y_j + \lambda_p \tau y + \epsilon \right) < 0 \end{aligned} \quad (150)$$

and therefore  $\lambda_i = \lambda^*$ , regardless of the value of  $y_i$ .

With strong altruism,

$$\eta m' \left( y_p + \sum_{j \neq i} y_j + \lambda_p \tau y + \epsilon \right) > 1 \quad (151)$$

Accordingly, there will be an interior solution to the voter's problem if  $\eta m'(\cdot)$  is sufficiently

large. If this is the case,

$$\begin{aligned}
& -1 - \alpha \cdot (N + 1) \cdot h' \left( y + \epsilon + (N + 1) \lambda_p \tau y - \frac{\sum_j y_j}{N} \right) \\
& + \eta m' \left( y + \sum_{j \neq i} y_j + \lambda_p \tau y_i + \epsilon \right) = 0
\end{aligned} \tag{152}$$

and  $\lambda_i > \lambda_p^*$  for all voters.

For the voter with higher endowment:

$$\begin{aligned}
& -1 - \alpha \cdot (N + 1) \cdot h' \left( y + \epsilon + (N + 1) \lambda_p \tau y - y - \frac{n}{N} p \right) \\
& + \eta m' (Ny + \lambda_p \tau y + \epsilon + (n - 1) p) = 0
\end{aligned} \tag{153}$$

For the voter with lower endowment:

$$\begin{aligned}
& -1 - \alpha \cdot (N + 1) \cdot h' \left( y + \epsilon + (N + 1) \lambda_p \tau y - y - \frac{n}{N} p \right) \\
& + \eta m' (Ny + \lambda_p \tau y + \epsilon + np) = 0
\end{aligned} \tag{154}$$

Therefore, the analysis is the same as in the proof to Prediction 5, and

$$\lambda_i(y) < \lambda_i(y + g). \tag{155}$$