A Model of Vote-buying with an Incumbency Advantage[*]

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Abstract:
Vote-buying, i.e., gifts given to voters before the elections in exchange for their votes, is a frequent practice during electoral campaigns in many parts of the world. However, in the presence of secret ballots, it is not clear whether and how vote-buying drives voting behavior. This paper proposes a simple model of vote-buying with two candidates where (i) the level of enforcement of vote-buying transactions is not fixed, (ii), bribable and non-bribable voters co-exist, and (iii) there is an incumbency advantage. In equilibrium both candidates buy votes. We find that a voter education campaign, understood to decrease the enforcement of vote-buying transactions or the share of bribable voters, decreases voter turnout and favors the incumbent.

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1 Introduction

The occurrence of vote-buying, understood as gifts given to voters before the elections in exchange for their votes, has puzzled economists and political scientists for many years.[1] The main questions have been: in the presence of secret ballots,[2] do voters that received gifts to vote for a candidate actually vote for that candidate? If yes, why? (Without a clear enforcement mechanism for vote transactions, vote-buying should not be expected to happen.[3]) Does vote-buying lead to better resource allocations? To answer these questions, the literature on vote-buying has been unusually divided between theory and empirics, without much intersection between these two types of research.

The theoretical literature on vote-buying has focused on the desirability of voting markets on efficiency grounds, always assuming enforceability of vote-buying transactions. Disparate conclusions have been presented by a number of authors under just slightly different assumptions. Philipson and Snyder (1996) argue that equilibria in markets for votes involve vote-selling only when it is Pareto-superior. Dal Bo (2007) finds that a principal can influence the decisions of a committee at no cost and induce inefficient outcomes. Dekel et al (2008) find that efficiency is independent from the presence of vote-selling and from the specific forms that it may take. In addition, this theoretical literature on vote-buying, in the tradition of its main workhorse model by Groseclose and Snyder (1996), finds unrealistic equilibria yielding vote-buying by a unique candidate.

The empirical research on vote-buying has focused on vote-buying in developing countries, where this phenomenon is most visible. Brusco et al (2004), Stokes (2005), and Nichter (2008) use non-experimental survey data on vote-buying in Argentina to test

[1] See Shaffer (2007), for a review of the main issues on the study of vote-buying.
[2] Secret ballots led to a substantial decrease in vote-buying in the end of the XIXth century in the US and England, as described by the historical studies of Cox and Kousser (1981) and Cox (1987). Converse (1972) relates the introduction of secret voting in the US to a decrease in voter participation, consistently with our model.
[3] Note that we distinguish vote-buying from clientelism, usually seen as the exchange of favors (e.g., jobs in the public sector) conditional on winning the election. These transactions are easier to enforce and call for long-term relationships between politicians and their clienteles (Robinson and Verdier, 2003). See Wantchekon (2003) for an empirical study of clientelism in Benin.

different hypotheses. Brusco et al (2004) look at individual correlates of vote-buying and emphasize the idea that vote-buying is effective when vote-buying transactions are enforceable. Stokes (2005) and Nichter (2008) test theories of party strategic behavior in face of the difficult enforcement of vote-buying transactions: while the first argues that parties target weakly opposed voters, the second puts the target on own strong supporters for whom voting behavior can be enforced through the observation of their turnout. Recently, Finan and Schechter (2010) provide evidence from Paraguay on the association between vote-buying (as measured in a survey) and reciprocity (as measured through lab games) at the individual level: they find support for the idea of self-enforcement of vote-buying transactions.

We propose a simple model of vote-buying that attempts to bridge the gap in the literature between theoretical and empirical work. The testable implications of this model are tested in Vicente (2013) using a field experiment consisting of the analysis of the impact of a randomized voter education campaign against vote-buying. Our model assumes two candidates in an election, who maximize their shares of the vote by buying votes (funded by budgets that are given). This is different from the literature, which usually takes politicians to aim for a majority of the vote. This is what allows us to have vote-buying by both candidates in equilibrium. We assume three types of voters. Base voters side with the incumbent, i.e., we assume an incumbency advantage.[4] Swing voters abstain in the status quo – this is meant to depict a standard cost of voting. Swing voters are divided between those bribable and those that cannot be bribed, i.e., those that do not accept gifts for their votes. In addition, those swing voters that can be bought do not necessarily vote according to the money they received, i.e., there is not full enforcement of vote-buying transactions. We derive what happens to voter turnout and the shares of the vote when shocks occur to the level of enforcement of vote-buying transactions, the share of swing voters that is bribable, and the budgets of the candidates. We find that voter turnout and the share of votes for the challenger decrease if the enforcement of

[4] Note that incumbents are documented to win most elections when there is electoral misbehavior or when they are held in Sub-Saharan Africa (Collier and Hoeffler, 2009).

vote-buying or the share of bribable voters decrease. The price (of the votes) increases with lower shares of bribable voters, and decreases with lower budgets.

In Section 2 we present the model of vote-buying, with assumptions, equilibrium, and comparative statics. Section 3 briefly discusses how the testable implications of our model were tested in Vicente (2013) and concludes.

2 Model

We propose a simple complete information game in the spirit of Groseclose and Snyder (1996), who analyze the buying of coalitions. Similarly to these authors, we assume a sequential game.[5] We consider the setting of an electoral campaign featuring two candidates, an incumbent I and a challenger C, who can buy votes. The voters are represented in a continuum.

We assume an incumbency advantage, which stems from the fact that half of all voters prefer I to C, i.e., the utility they derive from having I in power is higher than the utility they derive from having C elected. These voters are taken to be inflexible, in that they are not bribable during the electoral campaign.[6] We assume the other half of the electorate is formed by swing voters. These are the focus of our analysis as we assume only their votes can potentially be bought. We represent swing voters by $i \in [0,1]$, i.e., we normalize their size to 1. In the status quo, swing voters are indifferent between voting for I or C and abstain from voting.[7] We postulate that there is a share of swing voters that does not accept vote-buying offers in case they happen. We denote this share by $\lambda \geq 0$. We also assume that a candidate can buy the vote of any remaining swing voter

[5] Simultaneous-move games, less tractable in terms of equilibrium characterization, are based on the classical Colonel Blotto game - see for instance Roberson (2006). Groseclose and Snyder (1996) argue that a sequential setting helps explaining why candidates buy above-needed shares of votes (supermajorities).

[6] We may interpret this incumbency bias as the result of political strategies implemented during the mandate of I before the electoral campaign. Clientelism may be central to this advantage, as only I can credibly start the exchange of favors whose continuation is conditional on re-election: only I controls public sector employment and social programs.

[7] This can be thought as voter inertia in the presence of a standard cost of voting (see for instance Dhillon and Peralta, 2002).

with probability $\rho > 0$. As such, we assume candidates face some uncertainty when giving money to a swing voter (i.e., a swing voter who accepts the offer): only with probability ρ, the voter will take into account the money received when deciding to vote and for whom to vote. In other words there is a share $(1-\rho)(1-\lambda)$ of swing voters that accepts vote-buying offers but decides not to vote accordingly.

We hypothesize that each candidate's objective is to maximize her share of the vote, i.e., $V_I \equiv \frac{1+S_I}{1+S_I+S_C}$ for the incumbent, and $V_C \equiv \frac{S_C}{1+S_I+S_C}$ for the challenger[8], where S_j (with $j = I, C$) is the share of votes within swing voters. Candidates are assumed to take their budgets $B_j > 0$ (with $j = I, C$) as given – these budgets are assumed to be multiples of ε which is sufficiently small and positive in order to simplify our equilibrium analysis and guarantee the existence of equilibrium in pure strategies. For simplicity, budgets can only be spent on buying voters – we discuss this assumption further below.

As for the timeline of the game, we assume C moves first by approaching swing voters and proposing to buy their votes. C moves first because she faces the incumbency bias, and needs to counteract it: vote-buying close to the election is the only instrument at her disposal. Then I, knowing about C's move, has the opportunity of buying swing voters as well. Vote-buying offers are made in multiples of ε. Swing voters that do not accept vote-buying offers (share λ) are identifiable by candidates, and so they are not offered any money by any candidate. However, share $1-\rho$ of the remaining swing voters, will not respond to vote-buying and is not identifiable by candidates. After the incumbent moves, Nature defines whether each voter, within the share $1-\lambda$ of bribable swing voters, actually takes vote-buying into account with probability ρ. Finally, voters decide whether to vote and for whom to vote (mechanically). If voter i does not accept vote-

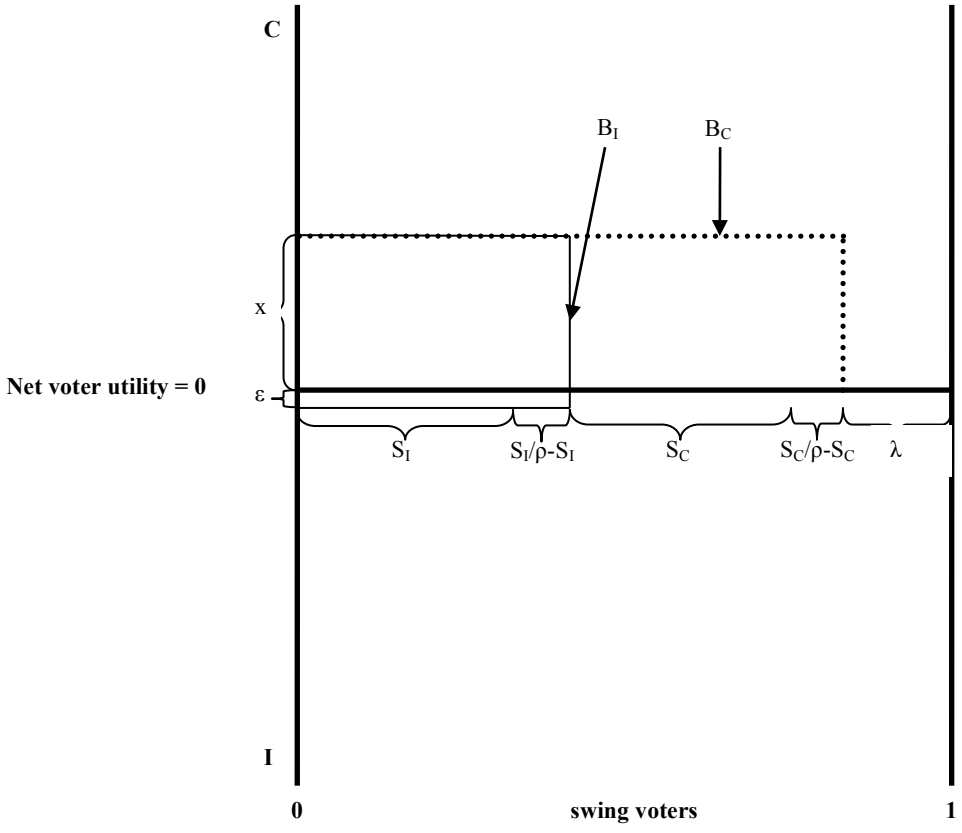
[8] This is different from Groseclose and Snyder (1996), as we assume candidates care about the size of their vote shares, instead of just about securing a majority of the vote. We are driven by the fact that empirically it is very common that both candidates buy votes (as is the case in all recent empirical studies we cite in this paper). This pattern does not arise in Groseclose and Snyder's equilibrium. In fact it does not arise in any of the latest models proposed to study vote-buying (Dal Bo, 2007; Dekel et al, 2008).

buying offers, he abstains. We denote $x_{i,j}$ as the amount of money given as vote-buying to voter i (i.e., through an accepted offer) by candidate j (with $j = I, C$). If voter i takes into account the money received as vote-buying, he will vote for the incumbent if $x_{i,I} > x_{i,C}$, and for C if $x_{i,C} > x_{i,I}$; if $x_{i,C} = x_{i,I}$, the status quo is not broken and voter i abstains. If voter i does not take into account the money received, he abstains.

2.1 Equilibrium

We look for the subgame perfect equilibrium of the game. Figure 1 illustrates equilibrium behavior.

Figure 1: Equilibrium



Proposition 1 (Equilibrium): If $B_C > B_I$, both candidates will spend their full budgets on vote-buying; C will spend an equal amount $x_{i,C} = \frac{B_C}{1-\lambda} \equiv x$ on all bribable swing voters, i.e., share $1-\lambda$ of swing voters; I will buy back $\frac{S_I}{\rho}$ (by definition) bribable swing voters by offering $x+\varepsilon$ to each. If $B_C \leq B_I$, C will be indifferent between buying any voters or not.[9]

If $B_C > B_I$, C will be able to use vote-buying to influence the electoral outcome. Given our simplifying assumption on zero opportunity costs of campaign spending, we know that candidates will spend all their budgets on vote-buying in order to maximize their vote shares. Starting from the end of the game, using backward induction, I will spend her vote-buying budget with the cheapest voters she can take back to her side. Taking back a voter to I's side means paying an additional ε per voter, over what C had paid: ε is sufficiently small and so, in order to maximize her vote share, I prefers to move a mass of people to her side instead of moving a slightly larger mass to abstention. C, given this anticipated behavior by I, will want to equally protect all voters she decides to invest on - all count the same towards the objective of maximizing her vote share. That means targeting all bribable swing voters, $1-\lambda$, and spending x on each one. In case $B_C \leq B_I$ happens, I can buy back all voters bought by the challenger, in which case C (knowing about I's budget) will be indifferent between buying voters or not, as she will not be able to influence the outcome of the election through vote-buying. This case is less interesting for our purposes, and is arguably less realistic, as in this model vote-buying represents the only opportunity for C of counteracting I's advantage, who had likely used available resources to reach voters earlier and through more effective means.

2.2 Comparative Statics

[9] Note that $B_j > 0$ implies the incumbent always secures a majority of the vote in equilibrium, i.e. just over 50 percent.

We now look at the effects of changing our parameters ρ and $1-\lambda$, which may be interpreted, respectively, as the effectiveness of vote-buying in driving electoral behavior and the frequency with which swing voters accept vote-buying offers. We also look at the effects of a proportional change in the budgets of the candidates, which we can interpret as being induced by a change in ρ. We focus on the case of $B_C > B_I$.

Proposition 2 (Decrease in ρ, the effectiveness of vote-buying): If ρ, i.e., the effectiveness of vote-buying, decreases, S_I and S_C will decrease proportionally. Both candidates will keep buying the same voters by offering the same amounts of money - price x will be maintained. This means both I's overall vote share, $\frac{1+S_I}{1+S_I+S_C}$, and abstention, $\frac{1-S_I-S_C}{2}$, will increase.

We argue ahead that a voter education campaign achieves primarily a decrease on the effectiveness of vote-buying. In case it happens, we have derived that the number of people accepting offers of vote-buying does not change, and that the price of vote-buying does not change either: the amount spent on vote-buying does not respond to a change in ρ in case campaign money has no opportunity cost. Abstention increases because both S_I and S_C diminish. I's overall vote share increases because of the proportionality of the change in S_I and S_C, and the incumbency advantage.

Proposition 3 (Increase in λ, the rejection of vote-buying offers - supply shock): If λ increases, i.e., the percentage of swing voters not accepting vote-buying offers, increases, S_I and S_C will decrease almost proportionally[10]. Both candidates will distribute their budgets over a smaller number of voters, which means the amounts of money offered by

[10] Given the fixed money used by I to break indifference, and the smaller number of voters available to be bought, I will be able to employ some of the indifference money from before buying additional voters (meaning a gain in her share of the vote). Provided ε is sufficiently small, this effect is negligible.

the candidates will increase - price $x \equiv \frac{B_C}{1 - \lambda}$ will increase. This means both I's overall vote share, $\frac{1 + S_I}{1 + S_I + S_C}$, and abstention, $\frac{1 - S_I - S_C}{2}$, will increase.

This result stems from the fact that candidates have the same amount of money to spend on fewer voters. Proportionality between S_I and S_C will be approximately maintained. We can then see that a supply shock in the market for votes will have as consequences a decrease in quantity of bought voters (those accepting bribes) and an increase in price. We argue ahead that this supply shock may explain why a voter education campaign may induce a decrease in the frequency of vote-buying: some voters may decide to stop accepting money from politicians.

Proposition 4 (Proportional decrease in both B_j, with $j = I, C$, the budgets of the candidates – demand shock): If both B_j, with $j = I, C$, i.e., the budgets of the candidates, decrease proportionally, both candidates will keep buying approximately the same voters – vote shares and abstention will be approximately the same.[11] However, they will adjust the amounts of money they offer, as price x will decrease.

We interpret this proportional shock on the budgets of the candidates as the continuation of the shock over the effectiveness of vote-buying ρ considered above. Suppose that a decrease on ρ happens. Then, in our model, since we assume exogenously given budgets and no opportunity costs, the money spent on vote-buying does not change (Proposition 2). However, it is very likely that available budgets for vote-buying will in fact decrease: vote-buying is now more ineffective and so there should be better alternatives uses for the vote-buying money. This could be demonstrated through slightly different modeling assumptions.[12] We find that the proportional decrease in the budgets leaves all

[11] Given the fixed money used by I to break indifference, and the decrease in the amounts spent by the candidates, I will have to shift some money from buying voters to covering the indifference (meaning a loss in her share of the vote). Provided ε is sufficiently small, this effect is negligible.

[12] The link between a decrease in ρ and a proportional decrease in the budgets of the candidates could be modeled explicitly through the introduction of one campaign funder for each candidate as new agents in the

approximately unchanged, except for the decrease in the price of the votes. We see ahead that this demand shock may explain a decrease in price following voter education.

3 Discussion

Our model of vote-buying by two candidates before an election provided us with a setting that explains the emergence of vote-buying by all candidates. Moreover, we derive what happens to equilibrium play after negative shocks to the enforcement of vote-buying transactions and to the share of bribable voters. Arguably these are direct effects of voter education against vote-buying, as it convinces voters not to vote according to the gifts they received, or even not to accept any gifts. We find that these shocks decrease voter turnout and favor the incumbent. Moreover the price paid by vote-buyers increases if the share of bribable voters decreases, and decreases if the budgets of the candidates (for vote-buying) decrease.

Vicente (2013) analyzes the impact of a voter education campaign against vote-buying in the 2006 presidential elections in Sao Tome and Principe, an island country in West Africa. This election featured the incumbent president Fradique de Menezes against main challenger Patrice Trovoada. Fradique de Menezes had a clear incumbency advantage as documented in that paper. Vote-buying by all candidates has been prevalent in this country, particularly after oil was found in the end of the 1990s. The voter education was randomized across locations and consisted of a leaflet campaign appealing to voting in good conscience, not according to money received from candidates.

Vicente (2013) finds that the reported perception that voters voted according to money received was strongly diminished, i.e., the enforceability of vote-buying transactions was negatively affected. The frequency of vote transactions also appeared smaller as a result of the intervention. Both these results match the main shocks we analyze in our model.

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model. These players would derive utility from consuming money and from providing their corresponding candidates with campaign funds. If these players have standard utility functions of the Cobb-Douglas form, with the weight of campaign financing being ρ, we are able to endogeneize the link between ρ and the budgets in line with our interpretation.

Consistently with its implications, as given by Propositions 2 and 3, Vicente (2013) finds that voter turnout was negatively affected (decreased by 3-6 percentage points), the incumbent was favored (his score increased by 4 percentage points), and the challenger was harmed (his score decreased by 4 percentage points). Vicente (2013) also finds that the price of votes decreased, consistently with the demand effect we capture in Proposition 4. However this empirical result is not fully robust in Vicente (2013). Indeed, from looking at our model, the supply effect stemming from a lower share of bribable voters (Proposition 3) could explain an increase in price.

We can then conclude that in the presence of an incumbency advantage, voter education against vote-buying can actually favor the incumbent by increasing abstention of swing voters. This is a somewhat surprising effect of voter education that shows how much we need to bridge between our empirical and theoretical understanding of vote-buying. As we see in our framework, the availability of vote-buying may help challengers to close the gap to front-running incumbents. Vote-buying may be increasing political competition, which may impact welfare. We believe that the communication between theory and evidence is of fundamental importance for the quantification of the welfare implications of vote-buying (see Khemani, 2012, for a recent empirical contribution), in our opinion the next big challenge of the literature on vote-buying. We hope the simple model in this paper helps developing that communication.

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