Electoral Risk and Vote Buying, Introducing Prospect Theory in the Experimental Study of Clientelism

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Abstract

Leveraging on the expected utility theory framework, most research asserts that parties in need of securing electoral support invest in vote buying. We consider this framework is limited in a number of ways. First, it assumes that losses and gains affect party's decision-making process in a comparable way—i.e., winning elections feels good as losing one hurts. Second, it assumes that the decision-making process of clientelist political parties focuses only on absolute levels of utilities while overlooking changes in outcomes respect to a reference point. Whether these assumptions hold is very important for understanding why parties buy votes. By introducing prospect theory in the clientelism literature, we hypothesize that parties are risk averse in the domain of gains and risk-seeking in the domain of losses—i.e., losing an election hurts more than winning an election pleases. This explains why clientelism is most likely when parties are probable winners or have experienced important losses in the past. These results are invariant to the political identity of voters (i.e., whether voters are swing or core voters). Unfortunately, the expected utility theory (wrongly) predicts that under these scenarios clientelism should not occur. After formalizing a theory of vote buying and vote selling within the expected utility theory, we tested it in the lab by designing an economic experiment. The voting experiment was carefully designed to capture different domains of gains/losses as well as varying reference points. Exploiting these novel experimental data, we show that prospect theory provides a better explanation of clientelism than do other theories based on the expected-utility theory. As the statistical analyses suggest, because of risk-seeking with respect to losses, experimental subjects adopt a more risky alternative buying votes in a way that is unpredicted by standard expected-value calculations.

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I. Parties With a Gambling Problem: Vote Buying as a Risky Yet Persistent Strategy

Vote buying is a very risky strategy.[1] First, it is illegal.[2] Buying votes requires extra care to avoid both reputational, electoral and legal costs. For instance, due to stigma associated with vote buying, clientelist political parties might risk electoral support from the wealthy (Weitz-Shapiro 2012) or from society in general (González-Ocantos, Kiewiet de Jonge, and Nickerson 2014). Second, vote choices are secret, thus preventing parties from effective monitoring and enforcing (Nichter 2008). Even in developing contexts such as Africa (Wantchekon 2003; Vicente 2014), the Philippines (Hicken, Leider, et al. 2018) and Latin America (Hidalgo and Nichter 2015; Oliveros 2019; Murillo, Oliveros, and Zarazaga 2021), voters might accept the private benefit but then secretly vote for another party (Stokes 2005; Nichter 2008; Szwarcberg 2013; González-Ocantos, Kiewiet de Jonge, and Nickerson 2014; Vicente 2014), making the risks taken by the clientelist party worthless.[3]

If clientelism is risky (Szwarcberg 2013, p. 43), expensive (Zarazaga 2014, p. 35) and uncertain (Rueda 2017), *How do political parties allocate scarce resources efficiently, targeting the "right" clients, and thus preventing waste?* In this paper we address two related but more specific questions about strategic vote-buying (i.e., clientelist targeting and political contestation). First, *Do political parties buy votes to reassure electoral loyalties (core voters) or to flip voters (swing voters)?* Second, *How risk-tolerant are parties when facing contested elections?* These are important questions as they speak about a party's decision-making process under risk. Unfortunately we find that the literature provides conflicting answers. This paper posits that these conflicting views about clientelist targeting and political contestation originate in the wrong understanding about the party's decision-making processes under risk implicit in the expected utility theory, as formalized by Neumann and Morgenstern (1947).[4]

Leveraging on the expected utility theory framework, most research asserts that parties in need of securing electoral support invest in vote buying. We consider this framework is limited in a

[1]Vote buying is defined as the distribution of rewards during elections in contingent exchange for vote choices (Nichter 2014, p. 316).

[2]Bahamonde (2020) explains that in the United States vote buying was illegal as early as the 1700s.

[3]In fact, since clientelism may also work even with low levels of enforcement and monitoring (Hicken and Nathan 2020), investments in clientelism are always done in contexts of very high risk.

[4]For the purposes of this paper, I focus exclusively on quantitative research. Just to name a few important qualitative contributions who are not necessarily framed in the EUT paradigm, see Scott (1972), Auyero (2000) and Szwarcberg (2013).

number of ways. First, it assumes that losses and gains affect party's decision-making process in a comparable way—i.e., winning elections feels good as losing one hurts. Second, it assumes that the decision-making process of clientelist political parties focuses only on absolute levels of utilities while overlooking changes in outcomes respect to a reference point. Whether these assumptions hold is very important for understanding why parties buy votes. By introducing prospect theory in the clientelism literature, we hypothesize that parties are risk averse in the domain of gains and risk-seeking in the domain of losses—i.e., losing an election hurts more than winning an election pleases. This explains why clientelism is most likely when parties are probable winners or have experienced important losses in the past. These results are invariant to the political identity of voters (i.e., whether voters are swing or core voters). Unfortunately, the expected utility theory (wrongly) predicts that under these scenarios clientelism should not occur. After formalizing a theory of vote buying and vote selling within the expected utility theory, we tested it in the lab by designing an economic experiment. The voting experiment was carefully designed to capture different domains of gains/losses as well as varying reference points. Exploiting these novel experimental data, we show that prospect theory provides a better explanation of clientelism than do other theories based on the expected-utility theory. As the statistical analyses suggest, because of risk-seeking with respect to losses, experimental subjects adopt a more risky alternative buying votes in a way that is unpredicted by standard expected-value calculations.

We contribute to the literature in three ways. First, prospect theory has not received much attention among political economists and comparative politics scholars (Vis 2011, pp. 338–339). In fact, Mercer (2005, p. 2) states that "political economists have shown no interest in prospect theory." We believe this is a serious issue that should be corrected. We intend to bridge this gap by offering an alternative theory of the political economy of vote buying but taking prospect theory as a starting point (Kahneman and Tversky 1979). Second, in this paper we follow Levy (1992b, p. 297) as we carefully try to not only show that the observed behavior of political agents is consistent with prospect theory but that prospect theory provides a better explanation of vote buying than do traditional descriptions of vote buying based on expected-utility theory. Third, and from a methodological standpoint, we follow (Aldrich and Lupia 2011; McDermott 2002) in that there is a need of implementing experiments aimed to test formal models, and such, we believe that "[p]olitical scientists might benefit from this process as well in order to both establish empirical validation of formal models and speed the cumulation of knowledge" (McDermott 2002, p. 45). Our paper is particularly relevant to the the study of democracy and development where experiments have been described as "a promising research tool that have the potential to make substantial contributions" (De La O and Wantchekon 2011).

This paper proceeds as follows. First, we explain the basics aspects of expected utility theory while paying special attention to several empirical departures. Importantly, we show how these departures are critical for our understanding of vote buying. Second, we explain the basic concepts behind prospect theory, while providing more details about the direct implications for the clientelism and vote-buying literatures. Third, following the basic intuitions of traditional voting games based on the expected utility theory we offer a basic formal model of vote buying. Fourth, we present our experimental design. Fifth, we analyze the experimental data. Sixth, we conclude by readdressing our results and discussing possible avenues for future research.

II. The Unexpected Findings of the Expected Utility Theory

As its core, the expected utility theory considers that the value of an outcome is equal to its payoff times its probability, and that agents choose the option with the highest weighted sum (McDermott 1998, p. 15, Levy 1992a, p. 173, Levy 1997, p. 88). Importantly, it is commonly assumed that all political agents obey the maxims of invariance, dominance, and transitivity leading to the maximization of utility (McDermott 2004, p. 291, Quattrone and Tversky 1988, p. 719).

Since the expected utility theory (EUT) "was one of the first theories of decision making under risk" (McDermott 1998, p. 15), EUT has dominated political science for the most part (McDermott 2004, p. 289, Levy 1997, p. 87), and the vote buying literature has been no exception. Just to name a few examples, Nichter (2008) used game-theoretical techniques to introduce the concept of "turnout buying," suggesting that parties deliver private benefits even when monitoring is absent. Gans-Morse, Mazzuca, and Nichter (2013) offer a formal model to explain that clientelist parties offer a mix four clientelist strategies during elections (vote buying, turnout buying, abstention buying, and double persuasion), while Rueda (2015, p. 428) "present[s] a model of vote buying in which a broker sustains bribed voters' compliance by conditioning future bribes." Similarly, Gallego (2014, p. 401) "presents a game-theoretical model of political clientelism in which a candidate disciplines a majority of voters through the promise of a future flow of benefit."

We contest this traditional approach focused on absolute gains by shifting the attention to losses and context-dependent decision-making processes. It actually seems rather interesting that most vote-buying theories are framed within the EUT without even declaring it, as it if were the default or go-to framework. It needs to be clarified that the root of the problem is *not* methodological (i.e., the use of game theory), but analytical, that is, the assumed decision-making process under risk embedded in the EUT. For instance, electoral explanations based on the EUT contend that voters see elections as "investments" (Downs 1957; Bassi, Morton, and Williams 2011), a notion that also holds for clientelist political parties under risk (Diaz-Cayeros 2008).

We believe that this shift in focus is a valuable exercise because theories based on the EUT contain descriptions of political behaviors that are "unrealistic" (Aldrich and Lupia 2011, p. 124). In effect, a large body of experimental research finds that the behavioral expectations under risk do not comport with the EUT (Battalio, Kagel, and Jiranyakul 1990, p. 25, Mercer 2005, p. 1). As a matter of fact, Bernoulli—the forefather of the EUT (Fishburn 1977)—"was the first to see [...] that people would not always bet solely on the basis of the expected value of a game" (McDermott 1998, pp. 15–16). From a decision-making standpoint, many find that "the assumptions underlying the classical theory of risky choice are systematically violated" (Quattrone and Tversky 1988, p. 719) and that both "variance and semivariance ideas of risk [...] have been shown to be inconsistent with von Neumann axioms" (March and Shapira 1987, p. 1405). Moreover, from an empirical perspective, there seems to be a strong consensus on the idea that "expected utility theory [...] continually failed empirically" (Vis 2011, p. 335), while others have explained that "[e]xperiments [...] have revealed that actual behavior and decisions frequently deviate from the neoclassical predictions" (Fatas, Neugebauer, and Tamborero 2007, p. 167). In sum, the empirical literature consistently finds that "people systematically violate the predictions of expected utility theory" (Barberis 2013, p. 173). In fact, Levy (1997, p. 87) finds "ironic" that just as rational choice has become the most influential paradigm in political science, EUT has come under heavy attacks by experimental *and* empirical evidence.

To be clear, much progress has been made in the understanding of clientelism and vote buying (Hicken 2011). Yet, there are several inconsistencies that authors tend to ignore or treat as unimportant empirical deviations. In this paper we address two important inconsistencies relevant to the understanding of vote buying. We concentrate on these two aspects because both directly speak to the party's decision-making process under risk.

Clientelist Targeting The first inconsistency that causes confusion in the literature is targeting: Where do rational clientelist political parties should invest their scarce clientelist resources, core or swing voters?[5] Intuitively, from a portfolio-diversification standpoint, investing in both swing and core voters should be the best response: the more diversified the targeted electorate (i.e., the "portfolio"), the less risk of losing the election (particularly in contexts of secret voting and monitoring and enforcing problems—Hicken and Nathan 2020; see also Auyero 2000, p. 58). In fact, according to the financial market, portfolio choice and investment decision-making literatures in economics, "[m]ost rational models of portfolio choice suggest that investors hold diversified portfolios to reduce or eliminate non-compensated risk" (Goetzmann and Kumar 2008). In the same vein, Goyal and Santa-Clara (2003, p. 978) "find a significant positive relation between average stock variance and the return on the market."

That is, if traditional vote-buying theories conformed with the EUT, we should see that both types of voters are targeted. Yet, the vote-buying literature seems to be quite divided on an issue that—following the expectations of the EUT—should be clear. In fact, Carlin and Moseley (2015, p. 14) state that "our knowledge of who parties target remains incomplete." On the one hand, Cox and Mccubbins (1986) and Zarazaga (2016, p. 7) explain that since constituencies are well known to clientelist parties, they allocate resources to core voters. On the other hand, Lindbeck and Weibull (1987), Dixit and Londregan (1996), and Stokes (2005) argue that since allocating resources to individuals who *ex-ante* vote for the party is a waste, parties target swing voters.

Why would clientelist parties invest in vote buying on swing *or* core voters, exclusively? Moreover, can parties even *identify* either type of voters? We believe that the clientelism literature expects too much from the party's monitoring capacities. Parties operate in very uncertain environments, particularly due to vote secrecy and social stigma, making both monitoring and enforcing very hard to accomplish (González-Ocantos, Jonge, et al. 2012; González-Ocantos, Kiewiet de Jonge, and Nickerson 2014; González-Ocantos, Kiewiet de Jonge, and Nickerson 2015; Kiewiet de Jonge 2015; Corstange 2018; Hicken and Nathan 2020; Bahamonde 2020). Hence assuming that parties can "clinically" discern who is a swing or a core voter, exceeds the real capacities of clientelist brokers. Ethnographic evidence for the Latin American cases seems to suggest similar ideas (Gay 1993; Gay

[5] We only discuss these two ideal types of voters. There are others that for simplicity we do not discuss. For instance, Zarazaga (2016, p. 7) introduces another category ("conditional supporters") who "will vote for the party machine only as long as unexpected events do not persuade them to do otherwise."

1998; Auyero 2000; Luna, Giannini, et al. 2011; Szwarcberg 2013).[6] Thus, it is very reasonable that parties not knowing *exactly* who is who, allocate clientelist resources to both types of voters.

Moving forward, recent contributions suggest that clientelist parties "may simultaneously target both swing and core groups of voters" (Albertus 2013, p. 1083), while in a similar vein Diaz-Cayeros (2008, p. 148) explains that long-lasting hegemonic parties (such as the PRI in Mexico) seek "to prevent core voters from defecting in the future," but newly elected incumbents in need of forging a new majority coalition target swing voters. In turn, and also considering the role of political contestation on vote buying, Corstange (2018) explains that parties "target clientelistic payoffs to inexpensive voters in their strongholds [i.e., core voters], but that head-to-head competition compels them to bid for more expensive voters [i.e., swing voters]." However, as we explain below, the latter finding on political contestation also seems to run counter to expectations derived from the EUT.

Political Contestation Another inconsistency that causes confusion in the clientelism literature is political contestation. Intuitively, the more contested an election, the more risks of losing the election, the more incentives to resort to vote buying to prevent that from happening (Scott 1972; Shefter 1977; Diaz-Cayeros 2008; Corstange 2018). Yet González-Ocantos, Jonge, et al. (2012, pp. 205–206) report that while in the 2008 Nicaraguan elections the incumbent party enjoyed 40% of the electoral support, 24% of registered voters were offered a clientelist gift in an election that "[was] not heavily contested." Why would a party buy such a massive amount of votes in a safe and uncontested election? Answering this question Weitz-Shapiro (2012, p. 570) suggests that "there is no consensus about the relationship between high levels of political competition and the phenomenon of clientelism." Exploiting the assumptions of the EUT, some have argued that vote buying should be higher in contexts of *low* political contestation. For instance, Medina and Stokes (2002) explain that political parties that hold an electoral monopoly tend to offer clientelist goods to deter the entry of political challengers. Similarly, Magaloni (2008) explains that hegemonic autocracies such as the PRI in Mexico have survived thank to successful deterrence strategies and clientelism.

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Unfortunately, these explanations seem at odds with normative theories in the risk-management and insurance-buying literatures in economics. If we think of vote buying as an insurance against

[6] Even normative scholars explain that parties have a hard time identifying voter's electoral intentions. For instance, Dixit and Londregan (1996, p. 1147) explain that clientelist parties track "constituents' likes and dislikes, *compulsively* participating in a spectrum of events [such as] baptisms and bar mitzvahs." Similarly, Stokes (2005, p. 317) argues that parties develop skills that allow them to infer whether clients voted for their party by *looking at them in the eyes* (emphasis is mine).

political losses, then utility-maximiser parties should "buy insurance" only in risky scenarios, that is, in cases when there is a high probability that the expected electoral outcome is a loss. As Arrow (1996, p. 111) explains, "those most at risk will buy more insurance than the others," a behavior that he describes as "adverse selection." This is in line with others that find that young individuals do not buy long-term care insurance (Meier 1999). In other words, if traditional theories of vote buying conformed with the EUT, clientelist political parties should buy votes only in cases of risking the election. Yet, they do when risks are low (González-Ocantos, Jonge, et al. 2012). To put it differently, parties should prefer the certain outcome (winning the election) rather than the gamble (buying votes). As March and Shapira (1987, p. 1405) explain, rational agents in the EUT framework, "when faced with one alternative having a given outcome with certainty, and a second alternative which is a gamble but has the same expected value as the first, [agents] will choose the certain outcome rather than the gamble."

In sum, the way in which the literature assesses clientelist targeting and political contestation seems to suggest that clientelist political parties waste valuable resources, dramatically departing from the predictions made by the EUT. We interpret this "misbehavior" (Thaler 2015) as an analytical problem, particularly, a wrong understanding of how political parties make decisions under risk. To solve this misunderstanding, next section introduces prospect theory (Kahneman and Tversky 1979) to the study of vote buying. Importantly, this section sheds light on why parties do buy votes from both swing and core voters (as found in Albertus 2013 and Diaz-Cayeros 2008), and also why they buy votes in contexts of low risk, that is when the most likely scenario is an electoral victory (as found in González-Ocantos, Jonge, et al. 2012).

III. Prospect Theory and its Implications for Clientelism: When Losses Loom Larger than Gains

Prospect theory "is a theory of decision making under conditions of risk" (McDermott 1998, p. 15), and was developed by Kahneman and Tversky (1979) as a way "to incorporate the observed violations of expected utility into an alternative theory of risky choice" (Levy 1992a, p. 179), one that is based on empirical data (McDermott 2004, p. 290). Since its development, prospect theory has emerged as a "leading alternative" (Levy 1992a, p. 171), "best available description" (Barberis 2013, p. 173) and "empirically correct theory" (Vis 2011, p. 334) about how people evaluate risk (Ackert et al. 2006,

p. 5), particularly "[excelling] in providing a model that offers descriptively accurate formulations of the human decision-making process" (McDermott 2004, p. 292).

The theory has been most influential among IR scholars, unfortunately it has had just "limited" influence in political science (Mercer 2005, p. 2). Still, in comparative politics, there are several contributions that take prospect theory as a framework. For instance, Weyland (2002) studies levels of loss aversion of dictatorships when they perform radical economic reforms. Vis (2009) and Vis (2010) study welfare state reform showing that political gains are the necessary condition for not-unpopular reform, while for unpopular reform are deteriorating socio-economic situation, or political losses. In turn, Steinacker (2006) studies issue salience, Schumacher et al. (2015) focuses on party platform change, while Carreras (2019) argues that "that citizens who were in the domain of economic losses were more likely to take a risk and vote in favor of Brexit."

Since others have already provided very good reviews of prospect theory (Levy 1992a; Levy 1992b; Levy 1997; McDermott 1998; McDermott 2004; Mercer 2005; Mercer 2005; Vis 2011; Barberis 2013; Linde and Vis 2017; Vieider and Vis 2019), we will limit this section to describe its main components. The theory is based on two mainly empirically-derived concepts (Vieider and Vis 2019, p. 334). First, utilities are defined over changes in outcomes respect to a reference point ("reference dependence"). Note the sharp contrast with EUT where the focus is on absolute levels of wealth (Ackert et al. 2006, pp. 5–6). Second, individuals distort probabilities in an asymmetrical non-linear S-shaped way when making risky decisions ("likelihood dependence"). Note also another important difference with EUT where agents are assumed to treat probabilities linearly, "even with training and effort" (McDermott 2004, p. 293). As McDermott (1998, p. 18) clearly puts it, "prospect theory predicts that individuals tend to be risk averse in a domain of gains [i.e., when things are going well], and relatively risk seeking in a domain of losses [i.e., in the midst of a crisis]." This distinction also separates prospect theory from EUT where the latter assumes that "whether we are in a domain of gain or loss should not affect our attitude toward risk" (Mercer 2005, p. 1).

Reference dependence is the central idea in prospect theory (Barberis 2013, p. 178, McDermott 1998, p. 40). Thus, prospect theory pays special attention to the context in which decision-making processes take place (McDermott 2004, p. 293). In simple, prospect theory "allows people's preferences to depend on the circumstances they face" (Fatas, Neugebauer, and Tamborero 2007, p. 168, March and Shapira 1987, p. 1412, McDermott 2004, p. 294), which is usually (Vis 2011, p. 335) but not always (Levy 1992a, p. 174) the *status quo*,[7] and how it shifts over time (McDermott 1998, p. 28, McDermott 2004, p. 301).[8] As Kahneman and Tversky (1979, p. 273) put it more clearly, "the carriers of value or utility are changes of wealth, rather than final asset positions." In fact, contrary to the assumption of invariance (Barberis 2013, p. 186), a shift in the reference point should also lead to reversals of preferences (Quattrone and Tversky 1988, p. 719). For instance, there is strong support for the idea that prior losses (or "sunk costs") influence decisions, contrary to what normative theorists propose (Thaler and Johnson 1990, p. 643).

Likelihood dependence is another central idea in prospect theory. Prospect theory pays considerable attention to losses. Levy (1992a, p. 171) in fact explains that individuals "give more weight to losses than to comparable gains," which translates into the famous statement "losses loom larger than gains." Losses have also been the focus in other areas of political science (McDermott 2004, p. 298). For instance, Lau (1985, p. 132) explains that "negative information is more influential than comparable positive information."

Importantly, the likelihood of the value curve is non-linear. From an analytical point of view, we consider this is *the* feature that out trumps the normative expectations contained in EUT. Formally, the asymmetrical curvature of the likelihood explains why individuals have risk-averse behaviors in choices among gains but risk-acceptant behaviors in choices among losses (Levy 1997, p. 87). In the domain of gains, the concavity of the value function encourages risk aversion by undervaluing the probability of success of a gamble relative to a certain outcome (underweighting). However, in the domain of losses, the convexity of the value function encourages risk-seeking behaviors by exaggerating the probabilities of rare but catastrophic losses (overweighting) (Levy 1992a, pp. 183–184). Typical examples are individuals who tend to underweight likely events such as heart attacks (not changing diet) but tend to overweight rare events such as a plane crash (praying before landing). Unlike theories based on EUT, Kahneman (2012) explains that "Underweighting of moderate and high probabilities relative to sure things contributes to risk aversion [while] very low probabilities are either overweighted quite grossly or neglected altogether" (see also McDermott 1998, p. 32).

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In prospect theory, both reference and likelihood dependence lead to a more accurate description

[7] The location of the reference point emerges as a critical factor in the analysis of decisions (Kahneman and Tversky 1979, p. 288). Levy (1992a, p. 174) explains that the reference point could also be an "aspiration level." In a similar way, Koszegi and Rabin (2006, p. 1135) develop the idea of a reference point which consists of "expectations rather than the status quo." I owe this point to Salomo Hirvonen.

[8] While we do not focus on the role of emotions, others have found that "sad people will take more risk when trying to avoid a certain loss" (Campos-Vazquez and Cuilty 2014, p. 6).

of decision-making under risk. In fact, experimental evidence consistently finds evidence about decision-makers distorting probabilities in a non-linear way (Levy 1997, p. 87). In particular, the evidence suggests that in the domain of losses, risk-seeking decision-makers take *disproportionate risks* to avoid certain losses, while in the domain of gains, risk-averted decision-makers are *excessively eager* to secure gains (Levy 1992b, pp. 297, 299–300). This is explained because decision-makers "have difficulty with probability at extreme ranges" (McDermott 1998, p. 30). Finally, it is important to note while attitudes toward risk are usually portrait as aspects of personality (March and Shapira 1987, p. 1406), prospect theory is *not* a personality theory, that is, it is not necessary to know about the individual personality traits of decision-makers in order to predict behavior (McDermott 2004, p. 293, Vis 2011, p. 335)

The implications for vote buying are considerable. In sharp contrast to traditional vote-buying theories based on EUT, prospect theory predicts that clientelist parties should buy votes when are probable winners or have experienced important losses in the past, irregardless of whether the voter is a core or a swing voter.

Clientelist parties should buy more votes when they are probable winners because decision-makers will exaggerate the small probability of losing the election. We expect vote buying to be higher in favorable electoral scenarios by making vote-buying an attractive strategy due to the absolute aversion and intolerance to the (small) probability of losing the election. The mechanics of such decision-making process should then make clear that there is no "wasting" when buying votes in the domain of gains. This is consistent with prospect theory. Empirical studies confirm that "actors perceive themselves to be in the domain of losses more often than we would normally expect" (Levy 1992b, p. 291; see also (Lau 1985)), even if they are not. This implies that loss aversion explains why decision-makers are more concerned to prevent a decline than to increase it (Levy 1992b, p. 285, see also Levy 1997, p. 89). To sum, when things are going well electorally, clientelist political parties will tend to buy more votes because "future losses hurt more than future gains gratify" (Levy 1992b, p. 285).

Clientelist parties should buy more votes when they have experienced important losses in the past, making vote buying an attractive strategy by altering the decision-makers' reference point. Altering the reference point downwards increases (1) risk-seeking behaviors and (2) the tendency of decision-makers to bet on long shots (Kahneman and Tversky 1979, pp. 286–287), that is, the tendency of clientelist political parties of incurring in more risks (i.e., vote buying) when things are not going well, and the tendency to aspire winning hard elections even when having a history of past electoral losses. This behavior has been confirmed by others, that is, the tendency of individuals in the domain of losses to "break-even" (Thaler and Johnson 1990). This implies that political losers should buy more votes not necessarily because they want to win the next election but because they will try to compensate for past losses. (Levy 1992b, p. 297) notes that the elasticity of the risk-seeking behavior should be quite high because "the magnitudes of the losses need not be that large in order to induce risk-seeking behavior, even small losses should induce the risk-seeking behavior." Consequently, we expect a steeper predicted effect in the data analyses. To sum, "losses are harder for individuals to accept [hence, when] things are bad or likely to get worse, [decision-makers] are more likely to make risky choices to recover their losses" (McDermott 2004, p. 294).

IV. A Formal Model of Vote-Buying

Formal models can usually help experimentalists determine which theoretical settings and equilibria are most relevant to a particular causal hypothesis (McDermott (2002), Aldrich and Lupia (2011) and Barberis (2013, p. 174)). Thus, in this section we developed a vote-buying game within the Downsian-"spatial" paradigms (Downs 1957; Enelow and Hinich 1990; Plott 1991). The idea is to test the descriptive accuracy of the game-theory model in the experimental section of this paper (Lupia and McCubbins 1998, Bassi, Morton, and Williams 2011, p. 559, Dickson 2011, Tyszler and Schram 2016, p. 361, Vieider and Vis 2019, p. 1).

Following this tradition, we consider an electorate of n voters. Voters vote for a leader to implement a common policy γ from the set $\Gamma = \{1, 2, ..., 100\}$. Each citizen i has an ideal point x_i which is an *iid* draw from an uniform distribution over Γ. When policy γ is implemented, payoffs of citizen i are given by $u(D, x_i, \gamma) = D - |x_i - \gamma|$, where D represents the utility of implementing any given policy. This payoff can be incremented by transferences from both parties to voter i.

In this election, there are two candidates. One "left-wing" party and one "right-wing" party. The left-wing (right-wing) candidate represents a policy γ_L (γ_R) which is an *iid* draw from an uniform distribution over $\{1, ..., 50\}$ ($\{51, ..., 100\}$). The location of this policy give us the number of voters n_L leaning towards the left-wing candidate, while the number of voters leaning towards the right-wing party is given by $n_L + n_R = n$. While we consider that voters are attached to an ideological continuum, we do so with the sole purpose of modeling preferences—both formally and experimentally.[9]

Both parties negotiate with only one of these n voters. That voter is randomly selected from the total population n. Observe that the higher the n, the lower the representation in the election of this voter. That is, a larger n necessarily implies that every individual electoral choice matters less. However, if n is small, negotiating with this voter may be more attractive to political parties. This is because negotiating with a large number of voters is costly. We assume that each party has a budget (B) that they can use to buy votes. If a party decides not to negotiate with the voter (or the voter does no accept the offer), the party keeps this budget. The profits of party i is given by,

$$\pi_i(W, e_i, s_i) = W \cdot e_i + (1 - s_i \cdot a_j) \cdot B \tag{1}$$

where W ($W \geq B$) is a constant that represents how much each party values winning the election, $e_i = 1$ if party i wins the election, 0 otherwise, s_i is the fraction of B that the party offers to voter j who can accept the offer ($a_j = 1$) or not ($a_j = 0$). We study one version of this party-voter interaction, namely, when both parties make simultaneous offers to the voter, and voters decide whether to accept the offer or not.

The timing of the game is as follows: at the beginning of the game n voters and two political parties are randomly located on their respective ideal points: voters along Γ, the "left-wing" candidate along $\{1, ..., 50\}$, and the "right-wing" candidate on $\{51, ..., 100\}$. All locations are public information, as well as every party's budget B, the total number of voters (n) and the number of supporters of each party (n_L and n_R). In this game each party simultaneously decides whether to make a vote-buying offer to the voter. If a party decides to negotiate with the voter, privately offers the voter to buy his vote. Then the voter decides if to take the offer, or which one accept if he receives two offers. If he accepts an offer, he should vote for that candidate.[10]

Equilibrium In this case, both parties can offer certain amount in exchange for electoral support. Note that parties only have incentives to negotiate with a voter if he is the pivotal voter. That means that $|n_L - n_R| \leq 1$, and that voter i supports the ex-ante winner of the election ($i \in max\{n_L, n_R\}$).

[9] Ultimately, experimental subjects are not told anything about ideology. They only observe that there are a number of "points" associated with the victory of party A or party B. In this sense, voters lean ("ideologically") towards the party that gives them more points.

[10] It is important to consider that to simplify the game (and the experiment), accepting the offer necessarily implies compliance. That is, accepting the offer means voting for the party the voter accepted the offer from. We leave for future research the case where the voter may defect.

The voter prefers the party closer to her ideal point. If both parties are located at the same distance, the voter is indifferent. Denote by $i^* \in \{L, R\}$ the preferred party of the voter, and $-i^*$ the other party.

Note that, naturally, both parties want to make different offers. If the voter is pivotal, the less preferred party has incentives to offer him a certain amount m_{-i^*} such that the he perceives more utility voting for that party rather than voting for the opposite party, that is:

$$\begin{aligned} m_{-i^*} &\geq (D - |x_{i^*} - \gamma_{i^*}|) - (D - |x_{i^*} - \gamma_{-i^*}|) \\ &= |x_{i^*} - \gamma_{-i^*}| - |x_{i^*} - \gamma_{i^*}|. \end{aligned} \tag{2}$$

Parties expect winning the election but have limited budgets. Hence, they want to win the election at a minimum cost. If party $-i^*$ offers the voter $m_{-i^*} = |x_{i^*} - \gamma_{-i^*}| - |x_{i^*} - \gamma_{i^*}|$, he will be indifferent between voting for party i^* or party $-i^*$. Both offers $m_{i^*} = 0$ and $m_{-i^*} = |x_{i^*} - \gamma_{-i^*}| - |x_{i^*} - \gamma_{i^*}|$ are the minimum amount, but enough to make the pivotal voter indifferent between both political parties. Indifference gives the party some electoral advantage of winning of the election. Voter indifference gives two possible Nash equilibria. In one equilibrium the voter rejects the offer and votes for i^*. In the other equilibrium, the voter accepts the offer and the elected party is $-i^*$. If individuals are utility maximizers, they should be indifferent between these two equilibria.

V. Experimental Design: Buying Votes in the Lab

Building on our formal model of vote buying, a lab economic experiment was designed. The experiment was conducted in Chile by the *Centre for Experimental Social Sciences (CESS)* administered by the *University of Santiago* and *Oxford University, Nuffield College* between April 20 2021 and May 28 2021. It was programmed in `O-tree`, the online version of `Z-tree` (Fischbacher 2007). Following Harrison (2006) and others, our experimental design minimizes hypothetical bias and "cheap talk" by compensating subjects with real money according to their decisions (Morton and Williams 2010; Dickson 2011). At the beginning of each experimental session all participants were required to successfully complete two practice rounds.[11] Those data were not used in the statistical analyses. In addition, subjects received a show-up fee of $2,000 CLP. Payoffs depended on the

[11] To make sure participants understood the dynamics of the game, they were shown two examples of the voting game. Participants were required to enter the correct amount of points each hypothetical participant would receive in each example. Importantly, all actual participants had to enter the exact amount of points to continue playing the game.

quality of individual decisions.[12] Figure 1 shows the distribution of payoffs expressed in actual currency by role. Table A1 shows summary statistics broken down by pre-treatment observables. These covariates were captured by a battery of socio-demographic questions delivered at the end of the study.[13] A total of 102 subjects were recruited. Each subject played the game three times. The total sample size is 306. For every new game, a whole new randomization process took place.[14] Formally, we follow an in between-subjects design where different groups of individuals are randomly assigned to various experimental or control conditions (McDermott 2002; Tyszler and Schram 2016; Hwang 2021). The basic experimental flow is depicted in Figure 2.

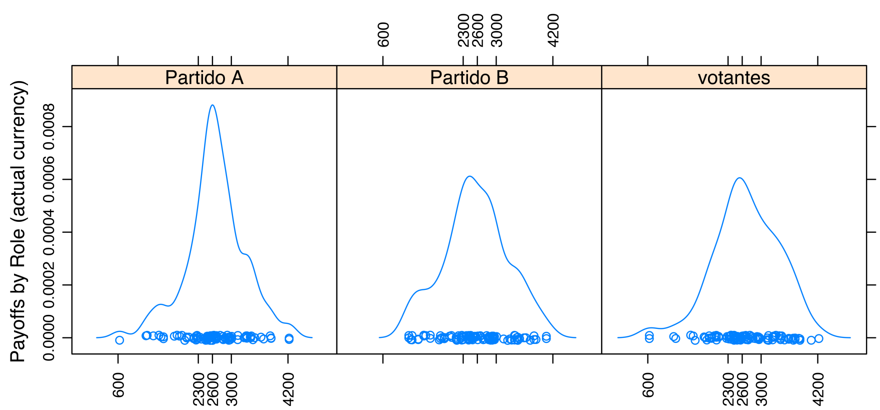

Figure 1: Distribution of Payoffs by Role (actual currency; show-up fee excluded).

Note: *Density plots show the distribution of payoffs expressed in actual currency by experimental condition. Amounts exclude the show-up fee of $2,000. 0%, 25%, 50%, 75% and 100% quantiles are shown (rounded).*

All transactions were performed exchanging experimental "points." We employed neutral terminology to maximize experimental control (Dickson 2011). Thus, throughout all three games, participants bought/sold votes and accumulated/lost wealth always expressed in experimental points. Every experimental point was equivalent to $0.42 CLP. Participants learned about the conversion

[12]Levy (1997, p. 95) notes that in poorer societies (like the Chilean society) conducting research with relatively smaller monetary incentives is still meaningful. However, see (Morton and Williams 2010; Bassi, Morton, and Williams 2011).

[13]The table also details the same information conveyed in Figure 1.

[14]That is, participants received a role, an "ideology," a party endowment and a contestability structure.

when reading the initial instructions. Final payoffs were converted to actual currency at the end of the study.

At the beginning of every game participants received a role at random. Following Dickson (2011), roles were presented using a neutral terminology to maximize experimental control. The design considered the following roles: *party A*, *party B*, or *voter*. Every game was played among three players (one *party A*, one *party B* and a *voter*).

Also, voters were assigned an "ideological" position at random. That is, voters received at random a certain amount of experimental points depending on whether party A or B won the election. For instance, if party A won the election, a voter would receive in that case 2,400 points, whereas if party B won the election, that voter would receive 200 points. Hence, the voter in this example should feel "ideologically" closer to party A. The idea was to model party-voter spatial distances, as considered by traditional voting theories based on the EUT (Downs 1957; Enelow and Hinich 1990). The basic intuition of this paradigm is that the set of candidates that are ideologically closer to a voter produce more utilities in the form of fiscal policies that are beneficial to that voter, either in terms of redistributive or free-market oriented policies (Acemoglu and Robinson 2009; Boix 2003, but importantly, see Haggard and Kaufman 2016). In short, our design mimics an electoral market where we can observe under which conditions different clientelist dynamics developed. Critically, this piece of information was not presented to participants as "ideology," but as the points either option would give. In turn, parties also received an "ideological" position which made them "closer" or "farther way" from the voter.

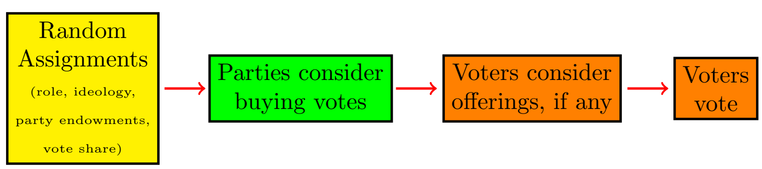

Figure 2: Experimental Flow and Timing of the Voting Game.

Note*: At the beginning of each experimental session all participants were required to successfully complete two practice rounds. A total of 102 subjects were recruited. Each subject played the game three times. The total sample size is 306. For every new game, a whole new randomization process took place. Formally, we follow an in between-subjects design where different groups of individuals are randomly assigned to various experimental or control conditions.*

Parties received as well different "endowments" at random. The idea was to reflect the fact that some parties are wealthier than others, a factor that might increase the probability of vote buying

(Juan Pablo Luna 2014). Note that both parties receive the same endowment. Since our experimental design is an in between-subjects design, we should be able to observe and exploit the statistical differences (if any) across "parties" with different endowments. Participants acting the "party" role accumulated/lost wealth depending on whether they got elected/not-elected. For every time they bought votes at some amount, that amount was discounted from their wealth. For simplicity, voters received zero endowments.[15] In turn, participants acting the "voter" role accumulated/lost wealth depending on whether their party got elected/not-elected (as per traditional EUT voting theories) and on whether they decided to sell/not-sell their vote. It is important to note that following our formal model and Tyszler and Schram (2016, p. 371), both ideology and party endowments were common knowledge.

In addition, both parties received at random an initial vote share, that is, a *certain* number of (fictional) voters that were going to cast their votes for each party. This number did *not* include the vote intention of the participant acting the "voter" role. Overall, this experimental condition mimics the degree in which an election is contested. In particular, this variable accomplishes two goals. First, it puts parties in different electoral contestation environments. In other words, it introduces the element of risk (of losing the election) in the game. Since voters win/lose points when their parties win/lose elections, this risk is also relevant for players acting the "voter" role. Second, it gives (or not) voters certain amount of electoral leverage. Since Downs (1957), traditional spatial theories of voting have considered that pivotal voters have more weight in an election, and hence, they might have incentives to sell their vote at higher prices. Given that all this information is public, this is piece of information is key in our experimental design.

During the second stage, parties decide whether to buy votes by making an offer. Experimental subjects acting the "party" role enter an amount of points, which ranges from zero to the maximum assigned budget in that round.[16] The design allows for simultaneous (offers from both parties), for one or zero offers. In the third stage voters evaluate offers (if any). If the party decided that it did not want to make an offer at that time, the voter is told that the party did not make an offer. Voters are told that accepting the offer necessarily implies voting for that party.[17]

[15]This is consistent with the vote-buying literature in that both poor and rich voters are prone to receive clientelist offerings (Bahamonde 2018). See also Szwarcberg (2013).

[16]Participants acting the "party" role are told that offering zero amount means they do not want to buy votes.

[17]For simplicity, we did not include the possibility of defecting. We encourage future studies to randomize certain probability of getting caught if defecting to encourage/discourage the behavior.

VI. Statistical Analyses: Risk and Vote Buying

Since the focus of this paper is on vote buying, we discarded the *voter* data and analyze all observations i acting any of the party roles (*party A* and *party B*). In particular, we analyze one main dependent variable, namely, the amount of the vote-buying offer made by parties (if any). The distribution is plotted in Figure 3.

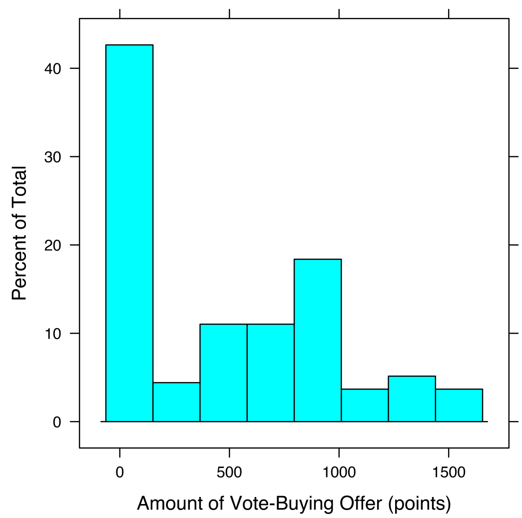

Figure 3: Distribution of the Dependent Variable.

Note*: Since the focus of this paper is on vote buying, we discarded the voter data. The new sample size consisting only in parties is N=136 (mean = 479, median = 500).*

From an internal validity standpoint, we expect this distribution to vary with the levels of risk the party is dealing with. Accordingly, if the predictions of our formal model (and the ones of the traditional vote-buying theories based on the EUT) are correct, the amount of the vote-buying offer made by parties should be higher in riskier scenarios (i.e., when facing probable electoral losses). Since vote share, ideological positions and endowments were public information (as formalized in our game), we believe these theoretical expectations should be consistent with the expectations of the traditional game-theoretical vote-buying literature.

From an external validity standpoint, we believe that voters in real elections can estimate with some degree of success actual vote shares, for instance, by looking at electoral polls. Voters can

add reference

also identify parties' ideological positions. For instance, Luna and Zechmeister (2005) identify a number of conditions that are associated with higher levels of elite-mass congruence in Latin America.[18] Voters can also make inferences about a party's endowment, and how those endowments can be redistributed in a clientelist fashion (Auyero 2000). In turn, the literature is consistent in that brokers also provide necessary information about available resources and how to get access to them (Murillo, Oliveros, and Zarazaga 2021). In sum, we believe this identification strategy appropriately captures the decision-making process under risk of political parties as theorized by traditional vote-buying scholars based on the EUT.

However, based on prospect theory, we have different expectations, i.e., parties should buy votes due to risk-seeking in the domain of losses (i.e., when experienced prior losses) and due to risk-aversion in the domain of gains (i.e., when being a likely winner as the idea of losing electoral support becomes unbearable).

To test these hypotheses we exploit the experimental data described above by fitting the OLS regression model specified in Equation 3,

$$\begin{aligned}\text{Offer}_i = \beta_0 + & \\ & \beta_1 \text{Vote Share}_i + \\ & \beta_2 \Delta \text{Points Accumulated}_i + \\ & \beta_3 \text{Spatial Distance}_i + \\ & \beta_4 \text{Party Budget}_i + \\ & \alpha_i + \epsilon_i \end{aligned} \tag{3}$$

where *Vote Share* is the certain number of (fictional) voters that were going to cast their votes for the party, Δ*Points Accumulated* captures changes in the accumulated points respect to the experimental round played in $t-1$. For instance, if a player won 1,200 points in $t-1$ but then lost 500 in the next round, then $\Delta Points\ Accumulated_t = 700$. Importantly, this variable captures sunk costs. The intuition is to evaluate whether they are not considered when evaluating new proposals, as the EUT posits it. *Party Budget* is the party budget, and α_i is a vector of participant fixed-effects.

If traditional vote-buying theories based on the EUT are correct, then we should expect $\beta_1 < 0$,

[18] However, see Visconti (2021).

$\beta_2 = 0$, $\beta_3 = \{> 0 \veebar < 0\}$ and $\beta_4 > 0$. In simple, the larger the vote share, the less vote buying (because there are less risks of losing the election). Prior losses or "sunk costs" should not matter for vote-buying. The closer a party is to the voter is either positive for vote buying (core voter hypothesis) or negative (swing voter hypothesis). The bigger the budget of a party, the more vote buying (for instance, incumbents are usually considered to be more prone to buy votes, see Weitz-Shapiro 2012; Szwarcberg 2013). However, if the expectations rather conform with prospect theory, we should expect $\beta_1 > 0$, $\beta_2 > 0$, $\beta_3 = 0$ and $\beta_4 = 0$.

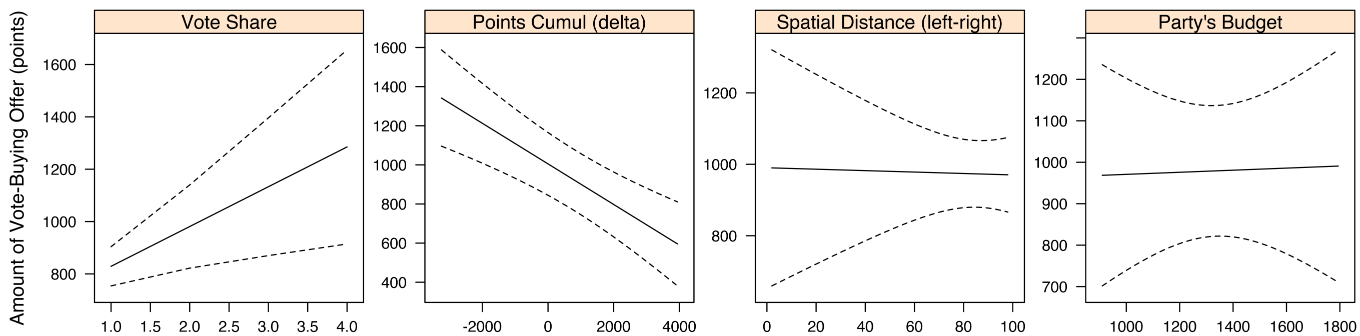

Figure 4: Predicted Values of Vote-Buying Offer.

Note: *Based on the OLS estimates in Table A2, the figure shows the predicted values of the offer made by the party expressed in experimental points. Confidence intervals were constructed robust standard errors (as shown in Table A2). Substantively, the figure shows that experimental subjects avoid losses by over-securing electoral support even in favorable contexts (panel 1) and do consider sunk costs and try to recover losses in the short run by spending more on vote-buying (panel 2). However, parties do not consider ideological/spatial distances with respect to their constituencies when making decisions nor do their budget, i.e., parties with more resources do not necessarily invest more vote buying (panels 3 and 4).*

Substantive results are shown in Figure 4 (regression table is shown in Table A2). Overall, results clearly depart from the theoretical expectations of traditional vote-buying theories based on the EUT, and widely support prospect theory. Parties do not buy votes when they are losing the election but when they are winning it (panel 1 in Figure 4). As prospect theory predicts, decision-makers in the domain of gains will exaggerate the unlikely scenario of losing the election and will become more risk-averse, making the strategy of vote-buying more attractive. Second, unlike the expectations EUT-based vote-buying theories, parties will consider sunk costs in their calculations and hence will buy votes when experiencing prior losses (panel 2 in Figure 4). That is, when parties are in the domain of losses they will be more risk-seeking, and gamble more money on vote-buying. Importantly, parties do not consider whether voters are swing or core voters (panel 3) neither consider their own budgets (panel 4).

VII. Discussion

pending.

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VIII. Appendix

	role	variable	n	min	max	median	iqr	mean	sd	se	ci
1	Partido A	left.right	66	1	10	3	4	4	2	0	1
2	Partido B	left.right	66	1	10	4	3	4	2	0	1
3	votantes	left.right	68	1	10	3	3	4	2	0	1
4	Partido A	male	66	0	1	0	1	0	0	0	0
5	Partido B	male	66	0	1	0	1	0	0	0	0
6	votantes	male	68	0	1	0	1	0	0	0	0
7	Partido A	party.id	66	2	9	9	0	8	2	0	0
8	Partido B	party.id	66	1	9	9	0	9	1	0	0
9	votantes	party.id	68	1	9	9	0	8	2	0	0
10	Partido A	party.like	66	0	1	0	1	0	0	0	0
11	Partido B	party.like	66	0	1	0	0	0	0	0	0
12	votantes	party.like	68	0	1	0	0	0	0	0	0
13	Partido A	payoff	73	633	4224	2630	674	2621	670	78	156
14	Partido B	payoff	72	1148	4062	2592	710	2607	665	78	156
15	votantes	payoff	75	633	4224	2674	836	2664	697	80	160
16	Partido A	salary.enough	66	1	4	2	0	2	1	0	0
17	Partido B	salary.enough	66	1	4	2	1	2	1	0	0
18	votantes	salary.enough	68	1	3	2	0	2	1	0	0
19	Partido A	vote.last.election	66	0	1	1	0	1	0	0	0
20	Partido B	vote.last.election	66	0	1	1	0	1	0	0	0
21	votantes	vote.last.election	68	0	1	1	0	1	0	0	0
22	Partido A	vote.next.election	66	0	1	1	0	1	0	0	0
23	Partido B	vote.next.election	66	0	1	1	0	1	0	0	0
24	votantes	vote.next.election	68	0	1	1	0	1	0	0	0

Table A1: *Summary Statistics*

	OLS
	Amount of Vote-Buying Offer
Intercept	678.24
	(492.02)
Vote Share	$152.03^{\cdot}$
	(79.94)
Points Accumulated (delta)	-0.10^{**}
	(0.03)
Spatial Distance	-0.20
	(2.75)
Party Budget	0.03
	(0.37)
R^2	0.71
Adj. R^2	-0.05
Num. obs.	136

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$; $^{cdot}p < 0.1$.
Robust standard errors in parentheses.
Fixed effects parameteres omitted in table.

Table A2: *Statistical Model (OLS): Amount of Vote-Buying Offer*