Competitive Clientelism

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Abstract. In many developing democracies local party operatives are charged with distributing state goods to citizens. These goods, which include medicine, food, and public employment, are crucial components of anti-poverty programs. So it is troubling that we find broker theft is common. Beyond normative implications, this theft is puzzling. Why do party bosses rely on brokers who take resources that could be used to win votes? Why do voters support parties whose brokers take their resources? In this paper we explain, why both bosses and voters have incentives to support a system of mediated distribution even when brokers take resources that should be distributed to voters. We also identify the conditions that give bosses incentives to circumvent brokers in favor of direct distribution.

In many democracies throughout the world, leaders of political parties employ local party operatives, commonly known as brokers, to generate electoral support and votes by distributing basic material goods. Brokers distribute goods that address immediate and pressing needs, like food and medicine. They also often control access to state public employment and monthly subsidy programs that provide longer term poverty alleviation. Although these brokers are acting on behalf of party bosses, whom want to win elections, we find that brokers often privately consume resources that should be distributed to voters.

In Argentina, an important developing democracy, evidence of this theft is easy to find. For example, a poster in a city hall of a municipality near Buenos Aires described *Program familias por la inclusión social*, which provides subsidies for children or dependents with disabilities; the poster included the following warning: "No one can obligate you to associate with any organization *nor take money* from the subsidy under any cirumstance."[1] For more systematic evidence, we conducted a survey of 800 brokers across four Argentine provinces and found that about 56% of the surveyed brokers said that at least half of all brokers take resources that should be distributed to voters. Only about 9% of these respondents said no broker takes resources.

Beyond the normative implications that are raised by broker theft, the fact that it occurs raises important puzzles for theories of political parties and clientelism. Clientelism is a prominent form of distributive politics in developing democracies,

1. The original text is "**Nadie puede obligarte** a que te asocies a ninguna institución ni a que te descueten dinero del subsidio **bajo ningún concepto**." Photos of the poster are included in the appendix.

in which political parties direct resources to voters who must provide political support in exchange for the resources. Nearly every theory of clientelism assumes that parties earn more votes when they distribute more resources to voters (e.g. Dixit and Londregan 1996; Kitschelt and Wilkinson 2007). If this is the case, why would bosses rely on brokers who privately consume resources that could be used to build vote share for the party? Perhaps even more puzzling, why do voters support a party when its brokers steal vital goods that could solve urgent problems in their lives?

1. The Challenge for Machines

The challenge facing party bosses is that they must achieve two objectives with their brokers. First, they must employ brokers who distribute resources to voters. Second, they must extract effort from brokers so that voters respond to the resources that brokers distribute. In this paper, we find that often extracting effort from brokers is facilitated by allowing the brokers to take a share of the resources that brokers distribute. In this section, we outline how brokers make voters more responsive to resources through their effort, and then explain why bosses and voters rely on brokers who take resources that should be given to voters.

Brokers, even as imperfect agents whose preferences are distinct from those of their boss, must undertake extensive effort to provide important services for their political parties. Brokers leverage their relationships with and knowledge of voters in their localities to make them more electorally responsive to resources (Auyero 2001). Brokers identify the voters who would provide electoral support in exchange for resources, and brokers channel resources towards these voters (Magaloni, Diaz-Cayeros, and Estevez 2007; Calvo and Murillo 2013). Brokers use resources to turn voters out for electoral rallies and to vote (Gans-Morse, Mazzuca, and Nichter 2010;

Szwarcberg 2012). They also exclude voters who do not respond to resources, and punish voters who take resources without providing electoral support (Stokes 2005).

Yet, brokers do not just rely on exclusion and punishment to help bosses win elections. Brokers undertake effort to perform many services that enhance the welfare of their voters, especially in settings with weak state institutions. For example, they solve complex everyday problems that arise in the lives of voters (Auyero 2001). Given the complexity and dynamic nature of challenges that arise in the lives of the poor, centralized state agencies and legislation affecting broad classes of individuals may be less effective in solving these problems (Scott 1969). They help voters negotiate state bureaucracies which are often opaque and labyrinthine (Krishna 2007). In settings where bureaucrats have discretion over whom they will help, brokers may provide crucial relationships that give voters access to state programs (Zarazaga 2014). Through their own effort they build neighborhood organizations, like soccer clubs and soup kitchens, and often run programs for the poor, children, and the elderly (Levitsky 2003). In general, brokers make voters more responsive to resources by building deep and ongoing relationships with the voters, which they leverage for electoral ends.

We argue that bosses tolerate some theft as way to compensate brokers for the effort that they undertake for the party. We find that under many circumstances bosses may even prefer these unreliable brokers, who are inclined to take resources, over reliable brokers who are disinclined to take resources and simply work for their party's victory. The reason is that brokers who only care about their party's victory face a collective action problem and may often under provide effort. Since brokers organize small groups, they realize that their individual effort cannot, in most circumstances, affect an electoral outcome. So they have incentives to free-ride from the efforts of others and under-provide all of the services that make clientelism work. We show that this problem does not subside for reliable brokers even when a boss induces intra-party competition between them. In contrast, bosses can use intra-party competition between unreliable brokers to limit the amount of resources they take, while extracting effort from them. So a team of unreliable brokers who undertake effort and distribute most of their resources might be the most feasible second-best solution for bosses.

Yet why should voters support a party that compensates its brokers with resources that should be allocated to the voters themselves? The answer to this question points to even further troubling implications for electoral democracy. While other scholars argue that threats and coercion keep voters in line, we show that even without these threats and coercion voters fail to reject unreliable brokers. Even when we allow a group of voters to act collectively against their broker, we find that voters have a higher tolerance for unreliable brokers than bosses. Although unreliable brokers drain resources from programs that are designed to alleviate poverty, voters may lack the power and organization to prevent welfare programs from being coopted by corrupt party actors.

2. Modeling the Siren Call of Unreliable Brokers

Here we present a simple model that identifies the reasons why party bosses rely on unreliable brokers and why voters accept them. The model also identifies when bosses will opt for distributing resources directly to voters. In the model party bosses face a basic choice of distributing resources through brokers or distributing resources directly to voters. We consider two types of brokers: reliable brokers, who work in politics to advance their party's victory, and unreliable brokers who work in politics to maximize the resources they can personally procure. In the first part of this section, we identify the conditions that cause bosses to distribute resources through unreliable brokers. In the next section, we allow a broker's constituency of voters to establish a norm of rejecting unreliable brokers and show that voters are always willing to accept unreliable brokers if bosses are willing to distribute resources through them.

2.1. **Brokers as Perfect Agents.** Here, we assume that brokers are perfect agents by assuming that they have the exact same preferences of their boss. Although we are not likely to find these brokers in empirical settings, we initially make this assumption, so that we can later understand the challenges that brokers create when they are imperfect agents. When brokers are perfect agents, we find that a boss would always distribute resources through through them. As perfect agents brokers always undertake effort and do not steal resources. In the subsequent section, we find that when brokers are imperfect agents, bosses cannot simultaneously extract effort and prevent broker theft except in limited circumstances that are not likely viable for political machines.

We begin by defining the electorate and the number of brokers that are employed by a party to mobilize the electorate. We assume that an electorate can be divided into groups that are small enough so that brokers can develop deep and ongoing relationships with every voter in the group. We denote the set that contains the groups of voters as G, and the number of groups that comprise an electorate is just the cardinality of this set denoted as $|G|$. We do not restrict $|G|$ to any particular number, but in most empirical settings it is likely to be large. The reason $|G|$ should be large is that brokers must undertake substantial effort to organize each voter, which means that brokers end up organizing small groups relative to the size of the electorate. For example, Camp 2014 finds that in a municipality near Buenos Aires just one city council member employs 135 brokers, and the mayor has built an organization that employs thousands of brokers who each organize distinct groups. In a more broader survey, he finds that a majority of brokers organize less than 200 voters each.[2]

Since we are interested in exploring the implications that arise when bosses motivate voters with resources, we assume that voters support the machine leader when they derive a net positive utility from the resources that a boss distributes. For electoral purposes, the voter's utility function is

$$u_i(L_g, r_g, r_p, c_i) = L_g r_g + \theta \frac{1}{|G|} r_p - c_i \tag{1}$$

Equation (1) captures the tradeoffs for a boss when she is choosing to distribute resources directly to a voter or through a broker. $r_g \in [0, 1]$ defines the resources that a broker distributes to her group. To simplify the model, we assume that a broker can either receive no resources or 1 unit of resources. If the broker receives resources, she must decide how to divide the unit of resources between herself and her voters. $L_g \in \{0, 1\}$ represents the broker's choice to undertake effort. It takes on the value of 0 if the broker in group g does not undertake effort, and takes on value of 1 if the broker in group g undertakes effort. So a voter only gains utility from resources that are distributed through brokers if brokers undertake effort. Indeed, it is difficult to imagine how these resources could affect a voter decision without a broker undertaking effort. The very act of a broker distributing resources requires

2. This is based on a survey that is embedded in a probability sample of a broker population drawn from four Argentine provinces: Buenos Aires, Córdoba, Misiones, and San Luis.

effort, and as argued above voters respond to resources distributed through brokers precisely because brokers undertake the necessary effort to build relationships with them that can be leveraged for electoral ends.

If a boss distributes resources directly to voters, the boss loses the ability to target groups, and voters are less responsive to the resources. $r_p \in [0, |G|]$ is an integer that measures the resources distributed directly to the voters in the electorate. These resources are distributed to all voters, since the boss is not using brokers to target the resources. $\theta \in (0, 1)$ measures the vote-producing efficiency of these resources. Since these resources are not complemented by the effort that brokers undertake, voters are less responsive to these resources, and so $\theta < 1$. Still, from DeLaO 2006 and Zucco 2013, we know that parties derive some electoral returns from resources that are distributed directly to voters, and so we assume that these resources have an effect on voter support but it is a smaller effect than if the resources were distributed though brokers who undertake effort.

Finally, c_i measures the cost of supporting the machine to the voter i. Empirically this cost could, in part, consist of time and effort that is required to vote. A voter may also experience an ideological cost or a cost in forgone resources that could be obtained by supporting an opposing party. This variable is uniformly distributed and generates an index of voters in group g with a support of $[0, 1 + \theta\frac{|G|-1}{|G|}]$. The upper bound of this support is defined so that the maximum vote share a party can earn from group g is less than 100 percent.

From this utility function, we can see that a voter in group g will support the machine if $c_i < L_g r_g + \theta \frac{1}{|G|} r_p$. The boss will earn a vote share of $\pi_g(L_g, r_g, r_p) = \frac{(L_g r_g + \theta \frac{1}{|G|} r_p)}{(1+\theta\frac{|G|-1}{|G|})}$ from group g. The boss's utility function is the party's total vote share:

$$U_l(r_g, r_p) = \frac{\theta r_p + \sum_{g=1}^{|G|} L_g r_g}{|G|(1 + \theta\frac{|G|-1}{|G|})} \tag{2}$$

Thus the boss wants to distribute resources to maximize vote share. We assume that resources are scarce and so boss has R resources where R is a positive integer and $R < |G|$. The boss's problem is then

$$\begin{gathered} \max_{r_g, r_p \forall g \in G} U_l(r_g, r_p) \\ s.t. \sum_{g=1}^{|G|} r_g + r_p \leq R \end{gathered} \tag{3}$$

Proposition 1. *If a boss has a team of brokers who all undertake effort and distribute all of the resources they receive from a boss to their voters, the boss maximizes vote share by distributing all of her resources through brokers.*

Proposition (1) indicates that a boss would like to channel resources through brokers, but it also specifies challenges for the boss. In particular, proposition (1) crucially depends on recruiting a team of brokers who are hard-working and honest. In the following sections, we find that achieving both of these objectives simultaneously is not feasible.

2.2. **Brokers as Imperfect Agents without Competition.** We now consider brokers who are imperfect agents by defining brokers as either reliable or unreliable. Reliable brokers want to maximize their party's vote share, but unlike their boss, these brokers experience a cost for undertaking effort. Unreliable brokers simply want to maximize their private consumption of resources, and also experience a cost for their effort.

Also, in this subsection we assume that bosses cannot discipline any broker by channeling resources away from a broker. Specifically we assume that a boss distributes all of her resources to R brokers, and that she does not have the option of inducing intra-party competition between brokers or of distributing resources directly to voters. We make this assumption here, so that we can subsequently understand how bosses derive benefits from being able to discipline brokers with competition. When a boss cannot discipline brokers, reliable brokers produce voters is a very limited set of circumstances that are not viable for most political machines, and unreliable brokers never produce votes. Later we find that the power to discipline brokers does not confer any advantages to the boss for reliable brokers, but it does confer substantial advantages for unreliable brokers.

Consider a machine that is composed of $|G|$ brokers, who work in politics to enhance their party's victory. Each of these brokers organize one group in the electorate. A broker can choose to contribute labor to mobilize a constituency or not contribute this labor, formally each broker chooses an action $L_g \in \{0, 1\}$. The boss can choose to award one unit of resources to each broker. If a broker receives resources, she must then choose what share of the resources to award her voters, and thus, $r_g \in [0, 1]$. A broker's group will yield a vote share of $\pi_g(L_g, r_g, r_p)$.

2.2.1. *Reliable Brokers.* Reliable brokers work in politics to enhance their party's victory, but clearly brokers have priorities outside of politics. Many brokers have jobs outside of politics, recreational interests, and familial obligations. Moreover, although this work can be politically and socially fulfilling, tasks like consistently canvassing voters can become painfully mundane. So, brokers incur a cost, defined as $c_g \in (0, \infty)$,[3] when they undertake effort for their party, and broker g's utility function is:

$$(4) \qquad u_g(r_g, L_g; r_{-g}, L_{-g}, r_p) = \frac{\theta r_p + L_g r_g + \sum_{-g=1}^{|G|-1} L_{-g} r_{-g}}{|G|(1 + \theta \frac{|G|-1}{|G|})} - L_g c_g$$

Proposition 2. *In a Nash equilibrium*

- *Reliable brokers never privately consume resources.*
- *Reliable brokers will not undertake effort, when the costs of doing so are sufficiently high. Formally, if broker g receives resources, she will only contribute effort if $|G| < \frac{1+\theta c_g}{c_g(1+\theta)}$.*

Proposition (2) indicates that a political machine, which is entirely comprised of reliable brokers will fail, as these brokers deem that their marginal impact on the electoral outcome does not merit the costs of achieving this impact. Empirical evidence indicates that a political machine will employ many brokers, and so the number of brokers, $|G|$, is generally large. So to satisfy the inequality constraint, $|G| < \frac{1+\theta c_g}{c_g(1+\theta)}$, the costs of undertaking effort for each broker, c_g, must be small. But empirical evidence also indicates that mobilizing voters requires substantial time and effort, which means that c_g is generally also large. Thus, in most circumstances reliable brokers should realize that although mobilizing a small group of voters takes substantial time and effort, delivering these voters is not going to change the electoral outcome. With this realization they will choose not to undertake the effort that makes clientelism work.

3. To simplify the model, we assume that the cost is the same for every broker.

2.2.2. *Unreliable Brokers.* Counterintuitively, bosses may want to construct a political machine that is comprised of brokers who do not derive any utility from their party's victory. Instead, a boss may rely on brokers who seek to advance their own power and wealth. This type of broker may want to maximize the resources he can procure from the party and then hoard as many resources as possible to enrich himself. He may also want to use the resources to extract future favors from voters as a means to build a power base that is independent of his party and its leaders. This broker must make the same decisions as the reliable broker, but his utility function is:

$$u_g(r_g, L_g) = \begin{cases} -c_g L_g : \text{Broker does not receives resources} \\ (1 - r_g) - c_g L_g : \text{Broker receives resources} \end{cases} \tag{5}$$

Proposition 3. *When a boss must distribute all of her resources through brokers and does not induce competition between them, unreliable brokers never undertake effort;* $L_g = 0 \forall g \in G$. *If brokers receive resources, they consume all of the resources;* $r_g = 0 \forall g \in G$.

Propositions (2) and (3) indicate that a boss who must distribute resources through brokers and who cannot punish them by withdrawing resources will lose elections. Without the ability to discipline brokers by withholding resources, unreliable brokers never produce votes, and reliable brokers only produce votes under extremely limited circumstances that are not likely viable for many political machines.

2.3. **Competition as a Mechanism to Discipline Brokers.** Bosses control resources; successful bosses will leverage this control to extract effort from brokers, and prevent them from consuming all of the resources that they receive. Here, we assume that brokers are imperfect agents, but now we give bosses the power to discipline brokers. This power comes in two forms. First, a boss can choose to circumvent some or all of her brokers by distributing resources directly to voters. Second, a boss can induce induce intra-party competition between brokers by soliciting bids from each broker, and awarding resources in a way that maximizes votes. We find that this discipline has no effect on the behavior of reliable brokers. In contrast, bosses can use competition to discipline unreliable brokers. The results indicate that bosses will often rely on unreliable brokers, and use competition as a means to extract votes from them.

To evaluate if the boss's control over resources provides leverage over brokers we introduce two stages to the game and identify the unique Sub-Game Perfect Nash Equilibria (SPNE). The stages are the following.

- Brokers Make Offers: In the first stage, each broker makes an offer, denoted as (L_g, r_g), to the boss that specifies how many voters each broker can produce if she receives resources. Formally, the number of voters each broker can produce which is defined as $\pi_g(L_g, r_g, r_p)$. This number is a function of the resources the broker chooses to consume, $r_g \in [0, 1]$, the effort level that broker chooses to undertake, $L_g \in \{0, 1\}$, and the direct transfer of resources that the boss gives the brokers group, r_p.
- Bosses Respond to Offers: In the next stage the boss either accepts or declines each offer; formally the boss selects an action for each broker $\alpha(L_g, r_g; L_{-g}, r_{-g}) \rightarrow \{A, D\} \forall -g \in G$, which is a mapping from broker g's offer and all of the other brokers' offers to a choice of accepting or declining broker g's offer. If she plays A in response to broker g's offer, she gives broker g 1 unit of resources and broker g follows through with his offer by delivering the promised voters.

In the background we are assuming that if a broker fails to follow through with her bid, she is punished by the boss and voters and so it is not rational to shirk a commitment to the boss.[4] If she plays D in response to broker g's offer, she does not award broker g any resources, and broker g does not undertake any effort to produce votes. If the boss does not expend all of her resources on brokers, she distributes the rest of the resources directly to voters. Thus, $r_p^* + nr_g^* = R$, where n is the number of brokers who receive resources in equilibrium.

2.3.1. *Reliable Brokers.* Can a boss leverage her control over resources to extract additional effort from reliable brokers? In the previous section we found that a broker will contribute effort if $|G| < \frac{1+\theta c_g}{c_g(1+\theta)}$, but if $|G|$ exceeds this threshold, then reliable brokers will not produce any votes. Clearly, the boss cannot extract any additional effort from these brokers when $|G| < \frac{1+\theta c_g}{c_g(1+\theta)}$. Can the boss extract additional effort in the more common situation of when the number of brokers exceed this threshold? The short answer is no.

Proposition 4. *When* $|G| > \frac{1+\theta c_g}{c_g(1+\theta)}$*, a strategy configuration is an SPNE if and only if the following conditions hold.*

- *Brokers make offers that will be rejected. Formally,* $\forall g \in G$*: all offers are* $(0, r_g^*)$ *where* $r_g^* \in [0,1]$ *or* $(1, r_g^*)$ *where* $r_g^* \leq \theta$*. If* $\alpha(L_g, r_g; L_{-g}^*, r_{-g}^*) = A$ *in response to the offer* $(1, r_g)$ *where* $r_g = \theta$*, then brokers propose* $(0, r_g^*)$ *where* $r_g^* \in [0,1]$ *or* $(1, r_g^*)$ *where* $r_g^* < \theta$*.*

4. Szwarcberg 2012 provides extensive evidence of the strategies that bosses use to ensure that brokers follow through with their commitments.

- *The boss rejects all of the equilibrium offers of every broker. Formally, the boss plays* $\alpha^*(L^*_g, r^*_g; L^*_{-g}, r^*_{-g}) = R\ \forall g \in G$.
- *In off the path play, the boss prioritizes awarding resources to brokers who produce the most votes and produce more votes than the boss could earn by distributing resources directly to voters.*

  Formally, the boss will play $\alpha(L_g, r_g; L_{-g}, r_{-g}) = D$ *in response to* $(0, r_g)$ $\forall g \in G$. *Next, consider any sequence:* $(1, r_{g[1]}), (1, r_{g[2]}), \ldots (1, r_{g[K]})$ *that satisfies the property* $r_{g[k]} \geq r_{g[k+1]}$ *and where* $K \leq |G|$. *Define* k^* *and* k^{**} *such that the following conditions hold* $\forall k \leq k^*\ r_{g[k]} > \theta$, $\forall k > k^*$ *and* $k < k^{**}$ $r_{g[k]} = \theta$ *and* $\forall k \geq k^{**}\ r_{g[k]} < \theta$.

  - *If* $k^{**} < R$ *the boss will play* $\alpha(1, r_{g[k]}; L_{-g[k]}, r_{-g[k]}) = A\ \forall k < k^*$. *The boss will play* $\alpha(1, r_{g[k]}; L_{-g[k]}, r_{-g[k]}) = A$ *or* $\alpha(1, r_{g[k]}; L_{-g[k]}, r_{-g[k]}) = D$ $\forall k$ *such that* $k^* \leq k \leq k^{**}$. *The boss will play* $\alpha(1, r_{g[k]}; L_{-g[k]}, r_{-g[k]}) = D$, $\forall k \geq k^{**}$.
  - *If* $k^* \leq R \leq k^{**}$ *the boss will play* $\alpha(1, r_{g[k]}; L_{-g[k]}, r_{-g[k]}) = A\ \forall k < k^*$. *The boss will play* $\alpha(1, r_{g[k]}; L_{-g[k]}, r_{-g[k]}) = A$ *or* $\alpha(1, r_{g[k]}; L_{-g[k]}, r_{-g[k]}) = D\ \forall k$ *such that* $k^* \leq k \leq R$. *The boss will play* $\alpha(1, r_{g[k]}; L_{-g[k]}, r_{-g[k]}) = D\ \forall k > R$.
  - *If* $R < k^*$, *the boss will play* $\alpha(1, r_{g[k]}; L_{-g[k]}, r_{-g[k]}) = A\ \forall k \leq R$ *and will play* $\alpha(1, r_{g[k]}; L_{-g[k]}, r_{-g[k]}) = D\ \forall k > R$

Proposition 4 tells us that a boss *cannot* use intra-party competition to extract any additional effort from brokers when they only work in politics to maximize their party's vote share. When a machine depends upon a large number of reliable brokers, the unique SPNE is that none of the brokers undertake effort to produce votes for the party and the boss is forced to distribute all of the resources directly to voters. She cannot resolve the collective action problem facing brokers, using her control over resources.

2.4. **Unreliable Brokers.** Can a boss leverage her control over resources to extract more effort from unreliable brokers and prevent these brokers from consuming all of resources that could be allocated to voters? If she can achieve these objectives, under what conditions does she earn more votes by distributing resources through brokers than by distributing resources directly to voters? In the previous section, we found that when unreliable brokers receive resources regardless of their actions, they do not produce any votes and instead consume the resources without exerting any effort. Now consider the case when the boss controls resources and solicits offers from the brokers in the same game structure as described above.

Proposition 5. *When brokers are unreliable, a strategy configuration is an SPNE if and only if the following conditions hold.*

- *If $1 - c_g > \theta$:*
  - *At least $R+1$ brokers propose to undertake effort and privately consume only the resources necessary to offset the costs incurred for undertaking effort. Formally, a set of S brokers, where $|S| \in [R+1, |G|]$, make offers of $(1, r_g^*)$ where $r_g^* = 1 - c_g$ $\forall g \in S$. $\forall j \notin S$, the brokers make offers of $(0, r_j^*)$ where $r_j^* = [0, 1]$ or $(1, r_j^*)$ where $r_j^* \in [0, 1 - c_i]$.*
  - *In on the path play, the boss accepts the offers from R brokers in the set S and the boss rejects the rest of the offers. Formally, consider any sequence: $(1, r_{g[1]}), (1, r_{g[2]}), \ldots, (1, r_{g[|K|]})$ that satisfies the property $r_{g[k]} \geq r_{g[k+1]}$ and where $K \leq |G|$. The boss plays $\alpha(1, r^*_{g[k]}; L^*_{-g[k]}, r^*_{-g[k]}) = A$*

$\forall k \leq R$. *The boss plays* $\alpha(1, r^*_{g[k]}; L^*_{-g[k]}, r^*_{-g[k]}) = D \ \forall k > R$. *The boss plays* $\alpha(0, r^*_g; L^*_{-g}, r^*_{-g}) = D \ \forall g \in G$.

  - *In off the path play, the boss's actions are the same actions that are specified in Proposition (4).*

- *If* $1 - c_g < \theta$*:*
  - *The conditions are equivalent to those specified in Proposition (4).*
- *If* $1 - c_g = \theta$*:*
  - *Any number of brokers propose to undertake effort and privately consume only the resources necessary to offset the costs incurred for undertaking effort. Formally, the offers from brokers are* (L^*_g, r^*_g) *where* $L^*_g \in \{0, 1\}$ *and* $r^*_g \in [0, \theta] \ \forall g \in G$.
  - *In on the path play the boss plays* $\alpha(L^*_g, r^*_g; L^*_{-g}, r^*_{-g}) = D$ *where* $L^*_g = 0$ *and* $r^*_g \in [0, 1]$ *or where* $L^*_g = 1$ *and* $r^*_g < \theta$. *The boss plays* $\alpha(1, r^*_g; L^*_{-g}, r^*_{-g}) \in \{A, D\}$ *where* $r^*_g = \theta$.
  - *In off the path play, the boss's actions are the same actions that are specified in Proposition (4).*

Proposition 5 tells us that a boss can use her control over resources to extract effort from brokers and prevent them from consuming all of the resources they receive. *Importantly, if the costs to brokers are sufficiently low, a leader of a political machine could win more votes with unreliable brokers than with brokers who simply want to maximize the party's victory.* Moreover, the ability to produce votes from unreliable brokers is completely independent from the number of brokers that comprise a machine. Put simply, a boss can use competition over resources to extract votes from unreliable brokers, but a boss cannot use competition over resources to extract votes from reliable brokers.

3. Voters

Although we have provided reasons why bosses may prefer brokers who work in politics to maximize their private consumption, why would voters follow brokers who take a share of the voters' resources? Why would voters support a party that utilizes these strategies? In this section, we show that there are many circumstances, in which voters who have unreliable brokers are better off than if the resources were just distributed directly to voters. Further, we show that even when voters are better off if the party distributes resources directly to voters, competition between brokers prevents voters from rejecting their unreliable broker. Surprisingly, we find that voters have a higher threshold for broker theft than party bosses.

We know from other scholars that if parties can punish individual voters by withdrawing resources from them, then voters will be compelled to support a party (Stokes 2005; Medina and Stokes 2007). Medina 2007 makes this argument explicitly, noting that no individual voter will vote against a boss who controls resources out of fear that she will be singled out and cut off from these resources. Stokes makes a similar argument by framing clientelist exchange as a repeated relation, where voters are punished indefinitely with a grim trigger strategy if they shirk on their agreement with the broker.

In our framework, we can show that a broker could use similar punishment strategies to compel voter support even when the broker is unreliable. But there are strong reasons to believe that such punishment strategies might not be viable over the long-term. After all, if a broker is taking significant resources from voters, and is constantly threatening these voters with punishments of withdrawing their resources, it is hard to imagine that the broker would maintain a good reputation in the community. In particular, we have argued that brokers organize small groups of voters, and must develop deep relationships with these individuals to be effective. While the occasional threat of punishment might be tolerated, constant abuse of relationships with voters should be rejected, especially if voters can align themselves with less exploitative brokers or circumvent brokers altogether. For these reasons, we want explore ways that voters would choose to align themselves with an unreliable broker even without an explicit threat of punishment.

First we explore the conditions under which voters are better off with unreliable brokers than when the party distributes all of the resources directly to voters. Since $R < |G|$ some groups of voters must be excluded, when a boss distributes resources through unreliable brokers. Therefore, we know that the excluded groups of voters will be worse off when all resources are distributed through brokers. Still it could be the case that the groups of voters who receive resources will be better off when resources are distributed through unreliable brokers.

Proposition 6. *Voters in groups whose broker receives resources will be better off than if the boss distributed all resources as a public good when* $1 > \frac{\theta R}{|G|} + c_g$.

Proposition (6) indicates voters who receive resources from unreliable brokers can be better off than receiving resources directly even when the brokers consume a some of the resources that they should be distributing to voters. In particular, the condition in proposition (6) is more easily satisfied as the scarcity of resources increases or as the cost that brokers incur for expending effort decreases. Both of these implications help us understand when clientelism and unreliable brokers will be tolerated. In poor states where resources are scarce, clientelism can create a favored coalition of voters. These voters accept unreliable brokers since rejecting them would risk losing their privileged access to resources. These voters may understand that even though their broker is unreliable, they are still better off with him and the privileged access he offers than if resources were shared more evenly throughout the electorate. Moreover, in poor states there may be many individuals who have limited employment opportunities. With a lack of better opportunities, the cost that a broker incurs from undertaking effort would be low and a broker may undertake effort to receive only a small percentage of the resources that are allocated to voters.

Even though the voters who receive resources are better off when $1 > \frac{\theta R}{|G|} + c_g$, there are many circumstances when the average utility of voters would be higher if all goods were distributed directly as a public good. This is due to the simple fact that brokers are extracting resources that would otherwise be distributed to voters. In cases of extreme scarcity, the net loss of resources incurred by voters could be quite large, since the inequality in Proposition (6) could be sustained with high values of c_g. This may leave some wondering if voters would tolerate unreliable brokers, or if they would have an incentive to implement a norm rejecting unreliable brokers. To answer this question, we add an additional stage to the game above, where voters as a group can implement a norm to reject brokers who privately consume resources.

Now the game is as follows:

- In the first stage, voters in group g, $\forall g \in G$ choose to accept brokers who privately consume resources or reject brokers who privately consume resources. If the group rejects brokers who privately consume resources, the broker can only deliver her votes if $r_g = 1$. If the group accepts a broker who privately consumes resources, the broker can choose any $r_g \in [0, 1]$.

- In the second stage, brokers make offers as defined in the previous game. Except now, if the voters reject brokers who privately consume resources then the broker must select $r_g = 1$ and $L_g \in \{0, 1\}$.
- In the final stage the boss either accepts or declines each offer in the same way as the game defined above.

Proposition 7. *In any strategy configuration that is an SPNE, at least R groups of voters will never reject unreliable brokers as long as distributing resources through unreliable broker instead of distributing resources directly to voters increases the political machine's vote share.*

Proposition (7) indicates that voters have a higher tolerance for unreliable brokers than party bosses. Fortunately, for voters, party bosses will only divert resources through unreliable brokers when $1 > \theta + c_g$. This means that the voters who end up receiving resources will be better off than if resources were distributed directly. But this also means that voters cannot prevent parties from using the voters' resources to compensate brokers for the effort they undertake to enhance their party's vote share. Simply by soliciting bids from brokers who organize voters, bosses can prevent voters from rejecting a wasteful system of mediated distribution.

Interestingly, without the restraint imposed by the party boss, voters would fail to reject unreliable brokers even when every voter would be better off if resources were distributed directly. Although this result is counterintuitive it is a relatively straightforward application of the prisoner's dilemma. Every group of voters consumes a share of the public good regardless of whether their broker also gets resources. Thus, each group of voters can consume a share of public goods and get additional resources from their broker. When $1 > c_g - \frac{\theta}{|G|}$, the resources that a voter receives from the broker offsets the small loss of resources that the voter experiences from a diversion of the public good. Unfortunately for the voters, every group has the same incentive. Collectively, they would deplete the public good, even absent of any overt coercion that forces them to align with an unreliable broker.

4. Discussion

Much of the recent literature on clientelism and political machines has focused on the types of voters that parties target to win elections. Despite disagreements regarding whether it is more efficient to target core voters who are deeply committed to a party or swing voters that could be persuaded by resources, generally scholars assume that all of the resources should be targeted towards voters. Yet, we find that many brokers privately consume resources that are slated to be distributed to voters. In this paper, we have explained why this theft is tolerated by bosses and how it can help bosses solve organizational challenges that could otherwise stifle a party's mobilizational capacity.

The general insight that resources can be used to solve organizational challenges is not new. Scholars of machine politics in the United States have long argued that bosses must expend significant resources to motivate party workers. George Plunkitt of Tammany Hall recognized the need to motivate party operatives with resources, declaring "I acknowledge that you can't keep an organization together without patronage. Men ain't in politics for nothn'. They want to get somethin' out of it" (Riordon 1995:47). Wilson makes a similar point by articulating four functions of targeted resources,

> It is a means available to the boss to induce his ward leaders to support him as boss... Patronage is a means whereby the boss induces elective

> office-holders to surrender to him all or part of their legally vested discretionary powers... Patronage is used to induce precinct captains to work for the machine by getting out the vote and dispensing favors to voters... Patronage, finally, is used to induce at least some voters to support the machine (Wilson 1961: 371).

In our analysis we have focused extensively on the role of resources in motivating brokers to mobilize voters. In doing so, we have developed new insights into why parties rely on brokers who take resources that could be distributed to voters. If parties rely on many brokers and brokers have obligations outside of their work in politics, then reliable brokers experience a collective action problem. This collective action problem persists even when bosses induce competition between reliable brokers in an attempt to extract more effort. In contrast, bosses can use intra-party competition to extract substantial effort from unreliable brokers and limit the resources that they consume. Although bosses still may prefer that brokers work hard and distribute *all* of their resources, building an organization of brokers who work hard and distribute *most* of their resources might be the best solution bosses can achieve.

Still paying brokers from the pockets of voters does not seem like a winning strategy. This paper's second contribution is showing how competition between brokers gives voters an incentive to support unreliable brokers even when brokers do not punish individual voters who have refused their support. Voters might be more inclined to accept unreliable brokers, if voters believe that bosses provide resources to the neighborhoods that produce the most votes and if brokers are effective in mobilizing vote share. Importantly, evidence indicates that voters who know brokers in their neighborhood are more likely to believe a party rewards neighborhoods who produce the most votes. In a 2003 survey of Argentine voters, we find that about 52% of the respondents who knew a neighborhood broker believed that parties deliver more resources to the neighborhoods that provide more votes. In contrast, only about 36% of the respondents who did not know a neighborhood broker believed that brokers were rewarded for delivering votes. This suggests that voters who know brokers may also believe that they have a personal stake in their broker's vote production. We have shown that these competitive dynamics can give voters incentives to tolerate unreliable brokers.

Taken together the more general insight of this paper is that both bosses and voters have incentives to support a system of mediated distribution that drains important resources needed by the poor. While surveying 800 brokers in Argentina, brokers noted that they provided goods and services including access to basic nutrition programs, public employment, prosthetic eyes and limbs, and even space in cemeteries. Moreover, the survey data indicate that parties employ hundreds to thousands of brokers in single municipalities. Although the welfare loss that broker theft generates is difficult to quantify, our theoretical analysis and the sheer scale of political machines suggests that it could be quite severe, even when incumbents consistently win elections.

But, our analysis is not entirely pessimistic. The model indicates that there are many circumstances when broker corruption will create incentives for bosses to shift resources into direct distribution. Indeed, recently scholars have found that the resources distributed through Conditional Cash Transfer programs provide electoral benefits even when the resources are not distributed through brokers. Future research might be able to further develop these insights by comparing the electoral returns from mediated versus unmediated distribution. We suspect that the loss of votes incurred from broker theft will be significant in this calculation.

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5. Appendix

For the following Lemmas and Proofs in this section consider any sequence: $(1, r_{g[1]}), (1, r_{g[2]}), \ldots, (1, r_{g[K]})$ where $K \leq |G|$ and that satisfies the property $r_{g[k]} \geq r_{g[k+1]}$. Define k^* and k^{**} such that the following conditions hold $\forall k \leq k^*\ r_{g[k]} > \theta$, $\forall k > k^* \text{and} k < k^{**}\ r_{g[k]} = \theta$ and $\forall k \geq k^{**}\ r_{g[k]} < \theta$.

Lemma 1. *The boss alway has a dominant strategy of rejecting offers of* $(0, r_g)$. *Say that the boss accepts the offers from* $n \in [0, R)$ *brokers. Then rejecting an offer of* $(0, r_g)$ *is strictly dominant if* $\frac{\theta(R-n)+\sum_{g=1}^{n} r_g^*}{|G|(1+\theta\frac{|G|-1}{|G|})} > \frac{\theta(R-n-1)+\sum_{g=1}^{n} r_g^*}{|G|(1+\theta\frac{|G|-1}{|G|})}$, *which simplifies to* $\theta > 0$.

Lemma 2. *The boss's strictly optimal response to any offer* $(1, r_{g[k]})$ *where* $k \geq k^{**}$ *is to reject the offer. Say that the boss accepts the offers of n brokers, where* $0 \leq n < R$. *The it is strictly optimal to reject* $(1, r_{g[k]})$ *if* $\frac{\theta(R-n)+\sum_{g=1}^{n} r_g^*}{|G|(1+\theta\frac{|G|-1}{|G|})} > \frac{\theta(R-n-1)+r_{g[k]}+\sum_{g=1}^{n} r_g^*}{|G|(1+\theta\frac{|G|-1}{|G|})}$, *which simplifies to* $\theta > r_{g[k]}$.

Lemma 3. *When* $k^* < R$, *the boss is always indifferent between accepting and rejecting any offer* $(1, r_{g[k]})$ *where* $k^* < k < R \leq k^{**}$. *Say that the boss accepts offers from n brokers, where* $0 \leq n < R$. *The the boss is indifferent between accepting and rejecting* $(1, r_{g[k]})$ *if* $\frac{\theta(R-n)+\sum_{g=1}^{n} r_g^*}{|G|(1+\theta\frac{|G|-1}{|G|})} = \frac{\theta(R-n-1)+r_{g[k]}+\sum_{g=1}^{n} r_g^*}{|G|(1+\theta\frac{|G|-1}{|G|})}$, *which simplifies to* $\theta = r_{g[k]}$. *Since* $R \leq n$ *where n is the number of brokers who receive resources in equilibrium* $\alpha_{g[k]} = D\ \forall k > R$.

Lemma 4. *When,* $k^* \leq R$ *the boss's strictly optimal response to any offer* $(1, r_{g[k]})$ *where* $k \leq k^*$ *is to accept the offer. Say that the boss accepts offers from n brokers, where* $0 \leq n < R$. *It is strictly optimal to accept the offer* $(1, r_{g[k]})$ *if* $\frac{\theta(R-n)+\sum_{g=1}^{n} r_g^*}{|G|(1+\theta\frac{|G|-1}{|G|})} < \frac{\theta(R-n-1)+r_{g[k]}+\sum_{g=1}^{n} r_g^*}{|G|(1+\theta\frac{|G|-1}{|G|})}$, *which simplifies to* $\theta < r_{g[k]}$.

Lemma 5. *When, $k^* > R$ it is optimal for the boss to accept the the offers $(1, r_{g[k]})\forall k \leq R$. From Lemma (4), we know that it is strictly optimal for the boss to accept offers from R brokers. Define an arbitrary subset of brokers $S \subset G$ where $|S| = R$ and define the sequence of offers $(1, r_{s[1]}), (1, r_{s[2]}), ..., (1, r_{s[|S|]})$ that satisfies the property $r_{s[k]} \geq r_{s[k+1]}$. We know that it is optimal for the boss to accept $(1, r_{g[k]})\forall k \leq R$ if $\frac{\sum_{k=1}^{R} r^*_{g[k]}}{|G|(1+\theta\frac{|G|-1}{|G|})} \geq \frac{\sum_{k=1}^{R} r^*_{s[k]}}{|G|(1+\theta\frac{|G|-1}{|G|})}$, which simplifies to $\sum_{k=1}^{R} r^*_{g[k]} \geq \sum_{k=1}^{R} r^*_{s[k]}$. If it is the case that $\forall g[k] \in S\ k \leq R$, then $\sum_{k=1}^{R} r^*_{g[k]} \geq \sum_{k=1}^{R} r^*_{s[k]}$ holds with equality. If it is the case that for some $g[k] \in S\ k > R$, then we know that $r_{g[k]} \geq r_{s[k]}$ $\forall g[k]$and $s[k] \in G$ and so $\sum_{k=1}^{R} r^*_{g[k]} \geq \sum_{k=1}^{R} r^*_{s[k]}$ holds. It is optimal for the boss to play $\alpha(1, r_{g[k]}; L_{-g[k]}, r_{-g[k]}) = D\ \forall k > R$, since $R \leq n$ where in in the number of broker who receive resources in equilibrium. Further, if it is the case that for some $g[k] \in S\ k > k^*$, then we know that $\sum_{k=1}^{R} r^*_{g[k]} > \sum_{k=1}^{R} r^*_{s[k]}$. So it is strictly optimal for the boss to play $\alpha(1, r_{g[k]}; L_{-g[k]}, r_{-g[k]}) = D\ \forall k > k^*$.*

5.1. **Proving Proposition (1).**

Proof. Without loss of generality consider the boss's choice of awarding one unit of resources to group g by deducting this unit from the resources that are distributed directly to the voters. If we can show that this action increases the boss's utility, for an arbitrary group g, then transferring resources from the public good to brokers always enhances the party's vote share since $R < |G|$. We know that this transfer of resources will increase vote share if $\frac{1}{1+\theta\frac{|G|-1}{|G|}} > |G|\frac{\theta\frac{1}{|G|}}{1+\theta\frac{|G|-1}{|G|}}$, which simplifies to $1 > \theta$. □

5.2. **Proving Proposition (2).**

Proof. First we prove that reliable brokers never have an incentive to privately consume resources. For this to be the case, $u_{g'}(1, L'_{g'}; r'_{-g'}, L'_{-g'}, 0) \geq u_{g'}(r'_{g'}, L'_{g'}; r'_{-g'}, L'_{-g'}, 0)$

where $r'_{g'} < 1$ must always hold. We can easily see that this weak inequality will always hold when $L'_{g'} \geq L'_{g'} r_{g'}$, which must be true since $r_{g'} < 1$.

If broker g' receives resources, she will undertake effort when $u_{g'}(1, 1; r'_{-g'}, L'_{-g'}, 0) > u_{g'}(1, 0; r'_{-g'}, L'_{-g'}, 0)$, which is the same condition as $\frac{1+\sum_{-g'=1}^{|G|-1} L_{-g'} r_{-g'}}{|G|(1+\theta \frac{|G|-1}{|G|})} - L_{g'} c_{g'} > \frac{\sum_{-g'=1}^{|G|-1} L_{-g'} r_{-g'}}{|G|(1+\theta \frac{|G|-1}{|G|})}$. This simplifies to $|G| < \frac{1+\theta c_{g'}}{c_{g'}(1+\theta)}$. □

5.3. **Proving Proposition (3).**

Proof. An unreliable broker g will consume all of the resources and not undertake any effort if $u_g(0, 0) \geq u_g(r'_g, L'_g)$ where $r'_g > 0$ and $L'_g = 1$. This inequality holds when $c_g \geq 0$. □

5.4. **Proving Proposition (4).**

Proof. First we show that the strategy configuration in Proposition (4) is an SPNE by showing that no player has a profitable deviation in any subgame.

- The party boss does not have a profitable deviation in any subgame.
  - The boss does not have a profitable deviation in on-the-path play. This is direct result of Lemmas (1) and (2)
  - The boss does not have a profitable deviation in off-the-path play.
    - Lemma (1) indicates that the boss does not have a profitable deviation from from playing $\alpha(0, r_g; L_{-g}, r_{-g}) = D$ in response to $(0, r_g)$ $\forall g \in G$.
    - If $k^{**} < R$: Lemma (4) indicates that the boss does not have a profitable deviation from playing $\alpha(1, r_{g[k]}; L_{-g[k]}, r_{-g[k]}) = A$ $\forall k < k^*$. Lemma (3) indicates that the boss does not have a profitable deviation from playing $\alpha(1, r_{g[k]}; L_{-g[k]}, r_{-g[k]}) = A$ or

$\alpha(1, r_{g[k]}; L_{-g[k]}, r_{-g[k]}) = D$ $\forall k$ such that $k^* \leq k \leq k^{**}$. Lemma (2) indicates that the boss does not have a profitable deviation from playing $\alpha(1, r_{g[k]}; L_{-g[k]}, r_{-g[k]}) = D$, $\forall k \geq k^{**}$.

* If $k^* \leq R \leq k^{**}$: Lemma (4) indicates that the boss does not have a profitable deviation from $\alpha(1, r_{g[k]}; L_{-g[k]}, r_{-g[k]}) = A$ $\forall k < k^*$. Lemma (3) indicates that the boss does not have a profitable deviation from $\alpha(1, r_{g[k]}; L_{-g[k]}, r_{-g[k]}) = A$ or $\alpha(1, r_{g[k]}; L_{-g[k]}, r_{-g[k]}) = D$ $\forall k$ such that $k^* \leq k \leq R$. Lemma (1) indicates that the boss does not have a profitable deviation from $\alpha_{g[k]} = D$ $\forall k > R$.
* If $R < k^*$: Lemma (5) indicates that the boss does not have a profitable deviation from $\alpha(1, r_{g[k]}; L_{-g[k]}, r_{-g[k]}) = A$ $\forall k \leq R$ and $\alpha(1, r_{g[k]}; L_{-g[k]}, r_{-g[k]}) = D$ $\forall k > R$

- No broker has a profitable deviation. Without loss of generality we consider broker g' and show that broker g' does not have a profitable deviation. Broker g' does not have a profitable deviation if $\frac{\theta(R-1)+r'_{g'}}{|G|(1+\theta\frac{|G|-1}{|G|})} - c_{g'} \leq \frac{\theta R}{|G|(1+\theta\frac{|G|-1}{|G|})}$. This simplifies to $|G| \geq \frac{r'_{g'}-\theta+\theta c_{g'}}{c_{g'}(1-\theta)}$. We know this inequality holds since $|G| > \frac{1+\theta c_{g'}}{c_{g'}(1+\theta)} \geq \frac{r'_{g'}-\theta+\theta c_{g'}}{c_{g'}(1-\theta)}$.

Now we show that no other strategy configuration can constitute an SPNE.

- A SPNE cannot be supported when the boss plays any on-the-path action other than the actions specified in Proposition (4). Any alternative strategy configuration would require:
  - That the boss plays $\alpha(L_g, r_g; L_{-g}, r_{-g}) = A$ for some $g \in G$. Yet Lemma (1) indicates that the boss would have a profitable deviation from accepting any offer of $(0, r_g)$. Lemma (2) indicates that the boss would have a

profitable deviation from accepting any offer of $(1, r_{g[k]})$ where $k \geq k^{**}$. Finally, an SPNE cannot be supported when $\alpha(1, r_{g'}; L_{-g}, r_{-g}) = A$, where $r_{g'} = \theta$. Say that the boss accepts the offer from $n \in [0, R)$ other brokers, then broker g' would have a profitable deviation since $\frac{\theta(R-n-1)+r'_{g'}+\sum_{g=1}^{n} r_g}{|G|(1+\theta\frac{|G|-1}{|G|})} - c_{g'} < \frac{\theta(R-n)\sum_{g=1}^{n} r_g}{|G|(1+\theta\frac{|G|-1}{|G|})}$, which is simplifies to $c_{g'} > 0$.

- A SPNE cannot be supported when the boss plays any off-the-path action other than the actions specified in Proposition (4)
  - If the boss plays $\alpha(0, r_g; L_{-g}, r_{-g}) = A$ for any $g \in G$ then Lemma (1) indicates that the boss will have a profitable deviation.
  - If $k^{**} < R$ then any alternative strategy configuration would require at least one of the following actions.
    - The boss boss plays $\alpha(1, r_{g[k]}; L_{-g[k]}, r_{-g[k]}) = D$ for some $k < k^{*}$. But Lemma (4) indicates that the boss would have a profitable deviation.
    - The boss plays $\alpha(1, r_{g[k]}; L_{-g[k]}, r_{-g[k]}) = A$, for some $k \geq k^{**}$. But Lemma (2) indicates that the boss would have a profitable deviation.
  - If $k^{*} \leq R \leq k^{**}$ then any alternative strategy configuration would require at least one of the following actions.
    - The boss boss plays $\alpha(1, r_{g[k]}; L_{-g[k]}, r_{-g[k]}) = D$ for some $k < k^{*}$. But Lemma (4) indicates that the boss would have a profitable deviation.
    - The boss will play $\alpha(1, r_{g[k]}; L_{-g[k]}, r_{-g[k]}) = A$ for some $k > R$. But this would violate the budget constraint of $R = r_p - n$ where n are the number of broker who receive resources in equilibrium.

- If $R < k^*$, then any alternative strategy configuration would require at least one of the following actions.
    - The boss plays $\alpha(1, r_{g[k]}; L_{-g[k]}, r_{-g[k]}) = D$ for some $k \leq R$ but Lemma (4) indicates the boss would have a profitable deviation.
    - The boss plays $\alpha(1, r_{g[k]}; L_{-g[k]}, r_{-g[k]}) = A$ for some $k > R$. But this would violate the budget constraint of $R = r_p - n$ where n are the number of broker who receive resources in equilibrium.

- A SPNE cannot be supported when the brokers play action other than the actions specified in Proposition (4). In the only alternative strategy configuration, an arbitrary set of brokers l such that $|l| \in [1, |G|]$, could make offers of $(1, r_g)$ where $r_g > \theta$. But in this case broker $g' \in l$ would have a profitable deviation since $\frac{\theta(R-|l|)+r_{g'}+\sum_{g=1}^{|l|-1} r_g}{|G|(1+\theta\frac{|G|-1}{|G|})} - c_{g'} < \frac{\theta(R-|l|)+\theta+\sum_{g=1}^{|l|-1} r_g}{|G|(1+\theta\frac{|G|-1}{|G|})}$, which simplifies to $|G| > \frac{r_{g'}-\theta+\theta c_{g'}}{c_{g'}(1+\theta)}$.

□

5.5. **Proving Proposition (5).**

Proof. First we show that the strategy configuration in Proposition (5) is an SPNE by showing that no player has a profitable deviation in any subgame when $1 - c_g < \theta$.

- The boss does not have a profitable deviation in any subgame.
    - The boss does not have a profitable deviation in on-the-path play. This is the result of Lemma (5).
    - The boss does not have a profitable deviation in off-the-path play. This proof is the same one that proved the boss does not have a profitable deviation in off the path play in Proposition (4).

- No broker has a profitable deviation. Consider broker g, where $\alpha(L_g^*, r_g^*; L_{-g}^*, r_{-g}^*) = A$. This broker could deviate by playing $(1, r_g')$ where $r_g' < 1 - c_g$ or by playing $(0, r_g')$ where $r_g' \in [0, 1]$. This is not a profitable deviation since the broker would still earn a payoff of 0. Any broker could deviate by playing $r_g' > 1 - c_g$, which is not a profitable deviation since $1 - r_g' - c_g < 0$.

Next we show that the strategy configuration in Proposition (5) is an SPNE by show that no player has a profitable deviation in any subgame when $1 - c_g \geq \theta$.

- The boss does not have a profitable deviation in any subgame. This proof is the same one used to prove that the boss has not profitable deviations in any subgame in Proposition (4).
- No broker has a profitable deviation. Broker g' could deviate by making an offer of $(1, r_{g'}')$ where $r_{g'}' \geq \theta$ in response to $\alpha(L_{g'}^*, r_{g'}'; L_{-g'}^*, r_{-g'}^*) = A$. Then the broker would get a payoff of $1 - r_{g'}' - c_{g'} \leq 0$ which is not a profitable deviation.

Next we show that the strategy configuration in Proposition (5) is an SPNE by show that no player has a profitable deviation in any subgame when $1 - c_g = \theta$.

- The boss does not have a profitable deviation in on-the-path play. This is the result of Lemmas (1) and (3).
- The boss does not have a profitable deviation in off-the-path play. This proof is the same one that proved the boss does not have a profitable deviation in off the path play in Proposition (4).
- No broker has a profitable deviation. Consider broker g, where $\alpha(L_g^*, r_g^*; L_{-g}^*, r_{-g}^*) = A$. This broker could deviate by playing $(1, r_g')$ where $r_g' < 1 - c_g$ or by playing $(0, r_g')$ where $r_g' \in [0, 1]$. This is not a profitable deviation since the broker

would still earn a payoff of 0. Any broker could deviate by playing $r'_g > 1 - c_g$, which is not a profitable deviation since $1 - r'_g - c_g < 0$.

Next we show that no other strategy configuration can constitute an SPNE when $1 - c_g < \theta$.

- A SPNE cannot be supported when the boss plays any on-the-path action other than the actions specified in Proposition (5). Any alternative strategy configuration would require one of the following actions.
  - The boss plays $\alpha(0, r_g; L_{-g}, r_{-g}) = A$ where $r^*_g \in [0, 1]$ or $\alpha(1, r_g; L_{-g}, r_{-g}) = A$ where $r^*_g < 1 - c_g$. But Lemma (5) indicates that the boss would have a profitable deviation. The boss could also play $\alpha(1, r_g; L_{-g}, r_{-g}) = D$ for a sufficient number of brokers such that $r_p > 0$. But Lemma (5) indicates that the boss would have a profitable deviation.
- A SPNE cannot be supported when the boss plays any off-the-path action other than the actions specified in Proposition (5). The proof is the same as in Proposition (4).
- A SPNE cannot be supported when the brokers play action other than the actions specified in Proposition (5).
  - No SPNE can be supported if any broker plays an offer of $(1, r_g)$ where $r_g > 1 - c_g$. This would result in payoff of less than 0 and so the broker would have a profitable deviation.
  - No SPNE can be support if more than $|G| - (R+1)$ brokers make offers of $(0, r_g)$ where $r_g \in [0, 1]$ or $(1, r_g)$ where $r_g < 1 - c_g$.
    * First consider the case of when a set of S brokers where $0 < |S| \leq R + 1$. Say that $\forall g \in S$ brokers make offers of $(1, 1 - c_g)$. Further say that $\forall g \notin S$, brokers make offers of $(0, r_g)$ where $r_g \in [0, 1]$

or $(1, r_g)$ where $r_g < 1 - c_g$. In this case, broker $g' \in S$ can profitably deviate by offering $(1, r'_{g'})$, where $\theta < r'_{g'} < 1 - c_{g'}$ and $r'_{g'} > r_g \forall g \notin S$ who make offers of $(1, r_g)$. If $\forall g \notin S$ the offers consist of $(0, r_g)$, then then g' can profitable deviate by making an offer of $(1, r'_{g'})$ where $\theta < g' < 1 - c_{g'}$.

∗ Next consider the case of when the offers consist of $(0, r_g)$ where $r_g \in [0, 1]$ or $(1, r_g)$ where $r_g < 1 - c_g \; \forall g \in G$. Say that the boss plays $\alpha(L_g, r_g; L{-}g, r_{-g}) = A \forall g \in S$, where $|S| \in [0, R]$. Then broker $g' \notin S$ would have a profitable deviation by playing $(1, r'_{g'})$ such that $r'_{g'} > r_g \forall g \in S$ and $r'_{g'} < 1 - c_{g'}$.

Next we show that no other strategy configuration can constitute an SPNE when $1 - c_g > \theta$.

- A SPNE cannot be supported when the boss plays any on-the-path action other than the actions specified in Proposition (5). This proof is the same as in Proposition (4).
- A SPNE cannot be supported when the boss plays any off-the-path action other than the actions specified in Proposition (5). This proof is the same as in Proposition (4).
- A SPNE cannot be supported when the brokers play action other than the actions specified in Proposition (5).
  - No SPNE can be supported if any broker plays an offer of $(1, r_g)$ where $r_g > 1 - c_g$. This would result in payoff of less than 0 and so the broker would have a profitable deviation.

Finally we show that no other strategy configuration can constitute an SPNE when $1 - c_g = \theta$.

- A SPNE cannot be supported when the boss plays any on-the-path action other than the actions specified in Proposition (5). Any alternative strategy configuration would require that the boss plays $\alpha(0, r_g; L_{-g}, r_{-g}) = A$ where $r_g \in [0,1]$ or $\alpha(1, r_g; L_{-g}, r_{-g}) = A$ where $r_g < \theta$. Lemmas (1) and (2) indicate that the boss would have a profitable deviation.
- A SPNE cannot be supported when the boss plays any off-the-path action other than the actions specified in Proposition (5). This proof is the same as in Proposition (4).
- A SPNE cannot be supported when the brokers play action other than the actions specified in Proposition (5).
  - No SPNE can be supported if any broker plays an offer of $(1, r_g)$ where $r_g > 1 - c_g$. This would result in payoff of less than 0 and so the broker would have a profitable deviation.

□

5.6. **Proving Proposition (6).**

Proof. Given proposition (5), if voters in group g receive resources through an unreliable broker, voter i will receive a payoff of $(1 - c_{g'}) - c_i$. If all resources are distributed as a public good voter i will receive a payoff of $\theta\frac{R}{|G|} - c_i$. Thus, voter i would prefer to receive resources through a broker when $(1 - c_{g'}) - c_i > \theta\frac{R}{|G|} - c_i$, which simplifies to $1 > \theta\frac{R}{|G|} + c_{g'}$. □

5.7. **Proving Proposition (7).**

Proof. From Proposition (5), we know that a boss will only distribute resources through unreliable brokers when $1 - c_g \leq \theta$. Further we know that the boss will offer resources to R brokers and we know that when $\alpha_g = A$, broker g proposes an offer of $(1, \theta)$.

To prove Proposition (7), first note that when $\alpha(L_g, r_g; L_{-g}, r_{-g}) = D$, the voters in group g are indifferent between accepting and rejecting brokers who privately consume resources, since resources are not distributed through the broker. Second, we first show that $\forall g \in G$ group g does not have an incentive to reject a broker who privately consumes resources if the boss plays $\alpha(L_g, r_g; L_{-g}, r_{-g}) = A$ as an equilibrium strategy. From Proposition (5), we know that a boss will only distribute resources through unreliable brokers when $1 - c_g \leq \theta$. Further, that when $\alpha(L_g, r_g; L_{-g}, r_{-g}) = A$, broker g proposes an offer of $(1, 1 - c_g)$. This means that the lowest amount of resources that the voters would receive occurs when $1 - c_g = \theta$, and thus, brokers who receive resources make offers of $(1, \theta)$. If we can show that g will not reject an offer of $(1, \theta)$, then clearly the voters will not reject an offer of $(1, r_g)$ where $r_g > \theta$. When the boss plays $\alpha(L_g, r_g; L_{-g}, r_{-g}) = A$ and broker g proposes an offer of $(1, \theta)$, voter i in group g has a payoff of $\theta + \theta \frac{1}{|G|} r_p^* - c_i$. If group g rejects brokers who propose to offer $r_g = \theta$, then as long as $c_g > 0$, Proposition (5) indicates that that broker g will propose an offer of $(0, 1)$ and that $\alpha(L_g, r_g; L_{-g}, r_{-g}) = D$. Thus, the payoff to voter i in group g from supporting a norm of rejecting brokers who privately consume resources is either $\theta \frac{1}{|G|}(r_p^* + 1) - c_i$ or $\theta \frac{1}{|G|}(r_p^*) - c_i$. When $\theta + \theta \frac{1}{|G|} r_p^* - c_i > \theta \frac{1}{|G|}(r_p^* + 1) - c_i$, group g does not have an incentive to reject brokers who privately consume resources. This condition simplifies to $1 > \frac{1}{|G|}$. $\square$