Social Networks and Public Goods Provision
Clientelism and Upward Social Mobility in Shantytowns

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Abstract

The literature on clientelism has extensively covered the direct exchange of material benefits for political support between voters and politicians. However, social dynamics such as peer pressure have been underestimated. This paper explores how variations in levels of connectedness and centrality in the social network affect local public goods provision. Through a two-stage game, we describe politicians portfolio diversification strategy. Candidates weigh the electoral payoff of honoring their campaign promises and the benefits from distributing particularistic goods (e.g. handouts in relational clientelism). Likewise, tight social networks allow political brokers to outsource monitoring to other members of the community. Social pressure resolves some of the informational problems inherent to clientelism, fostering coordination among same locality residents. Ultimately, the model considers the conditions under which local political actors are better off by allocating resources to non-excludable goods along geographical units. Finally, throughout empirics from the Indian locality of Udaipur, this study provides a plausible explanation for the disparity in public services and infrastructure among poor neighborhoods.

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Introduction

Why are some slums successful at demanding public goods while others just receive rice and beans the day before the election? How does the social network shape clientelistic dynamics in small localities? What governs the strategic choice of political actors facing the dilemma of resource allocation across poor neighborhoods? Building upon traditional models of clientelistic linkages under democracy, this paper examines the effects of the social organization -at neighborhood level- on the capacity of the poor to gain access to basic public services. Emphasizing the dichotomy between private transfers and the provision of local public goods, the study sheds light on the dynamics involved in collective clientelism.

In general the literature on clientelism has focused on the dyadic relationship between voter and broker, where political favors are exchanged for private benefits targeting the individual level. Yet, this perspective neglects the relevance of local public goods in clientelism (to target a geographic unit). Deriving utility from local public goods (non-excludable within the locality, thus non-contingent on vote choices) is a complex scenario, bringing into the picture collective action problems, such as free riding. The underlying assumption is that for a locality to be the recipient of an investment in public services, politicians require more than a couple of votes from that jurisdiction. This does not mean that they will refrain from distributing private benefits, but that it might be in their interest to mix both strategies.

The traditional literature on public goods lacks explanatory power in cases of poor informal settlements. Indeed the classical framework, where each agent contributes to a public good (to the point where the marginal benefit outweighs the marginal cost of effort) does not apply to a scenario where deriving utility from clean water is not a feasible possibility for slum residents. To begin with, taxation –the typical form of contribution– is not the path to public services in places where an informal economy dominates. Second, oftentimes access to basic services is mediated by local politicians, who control access to electricity, a water main, the provision of health services, and the like. All in all, there is a void in the literature as rarely do studies try to understand the two phenomena together. The literature of clientelism lacks in-depth studies on collective provision; whereas scholars on public goods and coordination problems generally ignore the role of the broker or even the existence of clientelism. The goal of this paper is to integrate these dynamics into one single model.

Then, why focusing on the social network features? The answer resides in the intersection of electoral coordination, community political organization, social pressure and the nature of non-excludable, non-rival local public goods. As poor voters tend to be clustered together in neighborhoods (e.g. slums), it is appropriate to conceptualize these localities as social networks characterized by individual voters and brokers that are bound together in the community. Hence, their political and social organization is very much relevant to the study of clientelism and has important implications for who among the poor receives access to basic public services. More explicitly, the social network impacts the informational flow, the monitoring structure (inherent to clientelistic linkages) and the role of leadership as a focal point for electoral coordination.
The formal model in the present study underscores the role of the social network measure for connectedness in the process of demanding public investment (bottom up). In this line, it seeks to establish the conditions under which successful coordination yields to improvements in public services. The comparative statics show that the network level of connectedness negatively impacts the costs for clientelism. For well connected slums, the broker’s job is simplified –through the social pressure mechanism– thus, the level of individual private benefits is reduced, all else equal. In addition, the level of connectedness indirectly affects the politician’s choice of public good provision, since by lowering the costs of clientelism, candidates possess more resources available to allocate to public services. Additionally, the provision of public goods (or the degree to which politicians honor campaign promises) directly increases with: i) level of retrospectiveness of voters; ii) size of the ‘machine core’; iii) the politicians’ discount factor. While the provision decreases with the voter’s discount factor. As the latter parameter goes to one, handout-dependent voters cannot pose a credible threat to punish the incumbent, thus politicians rarely honor their commitments and public good provision is extremely limited. Interestingly, in an alternative setup when there is no broker (or clientelistic structure), the level of connectedness directly affects the level of public good provision. This process occurs in the expected direction, for tighter networks we anticipate higher investment from the government in public services, since these localities entitle high power of coordination to either punish or reward politicians for their past actions.

This paper proceeds as follows. The first section describes how my theory fits into the current literature. The second section develops the main model. The third section analyzes the comparative statics and presents results. The fourth section presents a comparison between two poor neighborhoods in Udaipur, India. And finally, the conclusion presents a summary of the findings.

How my theory speaks to the related literature

Studies on clientelism have extensively covered the direct exchange of material benefits for political support between voters and politicians (Auyero 1999; Auyero 2000; Brusco, Nazareno and Stokes 2004; Calvo and Murillo 2004; Chandra 2004; Kitschelt 2000; Kitschelt and Wilkinson 2007; Krishna 2007; Levitsky 2003; Magaloni and Estevez 2007; Nichter 2008; Remmer 2007; Stokes 2005, among many others authors). In this paper, I use patronage and clientelism interchangeably. I define this process as a direct exchange between brokers and voters, where politicians do not target voters directly. Also, I consider the broker as an individual embedded in the local community, characterized as local leader, independent from political parties, but a necessary figure for politicians to allocate clientelistic resources. This model also includes, local public goods – elsewhere defined as pork-barrel (e.g. Stokes, Dunning, Nazareno and Brusco 2013). Although the assumption here is that these goods are non-contingent on individual vote choice, they are conditional on a certain level of electoral support from the locality. In the next pages, I proceed to extend the conceptualization, framing my model according to the following criteria.
Electoral vs. Relational. For the purposes of this paper, I do not consider clientelism as the anonymous machine politics, but as an on-going durable relationship between voter and leader. Building upon Auyero (1999) and Brusco, Nazreno and Stokes (2004), among others, I understand patronage as a repeated game, in which, on the one hand, voters provide political favors, vote choices, participation in rallies and mobilizing other voters; and on the other hand brokers deliver handouts, access to subsidies, welfare programs, health assistant, etc. My theory is circumscribed under relational clientelism, often described as a problem-solving network where favors are exchanged across neighbors. As opposed to electoral clientelism, relational clientelism involves benefits distributed countinously, before and after the election (Nichter 2010).

Excludability. Students of clientelism have generally focused on private goods -excludable at the individual or household level. Within private benefits, handouts like cash or food and non-material benefits such as jobs have been exhaustively examined (Calvo and Murillo 2004; Robinson and Verdier 2013). Within the framework of relational clientelism, my research considers this type of private benefits between brokers and voters, without further distinguishing between types of private goods. Nonetheless, the primary focus of the model is access to local public goods (LPG), or in other words: club goods, where the non-excludability criteria is residency in a certain locality. I understand LPG as part of the direct transfer from politicians to voters (through electoral promises).

Discretionality. At the local level, private goods are generally distributed on a discriminatory basis, a process associated with the erosion of accountability (Ferejohn 1986). However, there is often a blurry line between public and private goods. For instance, welfare programs can be defined on paper as universal (public good), but turned into a club good if a political actor has the influence to deliver it with discretion (Magaloni and Estevez 2007). The assumption in this paper is that brokers retain absolute discretion over how to allocate handouts. Moreover, politicians are free to decide where to build a hospital or sewage system according to their best political strategy, in spite of any legal or institutional arrangement that may limit the allocation.

To whom are the particularistic benefits distributed? A central question in the literature was directed towards the recipients’s ideological characteristics. The controversy can be summarized as follows: parties tend to target core voters (Cox and McCubbins 1986; Calvo and Murillo 2004; Levitt and Snyder 1995; Magaloni 2006) or swing voters (Lindbeck and Weibull 1987; Stokes 2005) or both (Dixit and Londregan 1996; Magaloni and Estevez 2007; Stokes et al. 2013; Nichter 2010).

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1 I use broker, leader or community leader interchangeably.
2 By addressing relationships between patron and client where benefits exist for both sides, this work does not focus on the exploitative or repressive aspect -involving violence or extortion- sometimes present in clientelism or patronage. In Kitchelt’s words: ‘Clientelism involves reciprocity and voluntarism but also exploitation and domination. It constitutes a logic of exchange with asymmetric but mutually beneficial and open-ended transactions’ (Kitchelt 2000: 849)
This work is aligned with the later approach initiated by Dixit and Londregan \(^3\) leaning towards a portfolio diversification strategy. However, despite extensive research on the topic, we still need a better understanding of what ‘core’ voters means: either those with a strong ideological affinity or voters from whom the party is able to gather more information, and thus target resources more effectively. Consistent with the later, this paper emphasizes the strategy of minimizing the dead-weight loss –or ‘leak in the bucket’. Local level political actors seek to minimize the inefficiencies inherent to distributing resources by targeting voters who belong to the machine or the broker’s network (Dixit and Londregan 1996; Calvo and Murillo 2013). Since distributors carry more information about these handout-recipients uncertainty is significantly lowered. In this line, my theory understands ‘machine voters’ as those emmbedded in the broker’s social network, independently from any ideological dimension, partisan attachment or policy preference.

**Poverty Trap.** Since poor voters derive higher marginal utility from income, scholars generally agree that clientelism particularly targets lower classes (Dixit and Londregan 1996; Brusco, Nazareno and Stokes 2004; Calvo and Murillo 2013, among others). As well, the empirical association between poverty and clientelism is fairly robust (see for example Remmer 2007 or Keefer 2007). In other words, particularistic benefits tend to go to the poorest sectors of society because buying their votes through direct transfers is more profitable for politicians, relatively to providing public goods. The findings in this paper are consistent with this theory: low-income localities will be more electorally responsive to direct transfers rather than local public goods.

Although there is still room for debate over the effects of vote buying on upwards social mobility, this project adheres to the theory of Poverty Trap, noticing that often the poorest localities are precisely locked in the clientelistic linkage. While some voters only receive handouts like food, clothes, construction materials and even alcohol the day before the elections; others experience substantive improvements in the provision of public services such as functioning sewage system, clean water, construction of roads, hospital, schools, and the like. The goal of my research is to understand who among the poor fail to demand better public services. Understandably, those living below the extreme poverty line, will not prioritize a sewage system within the list of requests. Clearly, this has a deleterious effect: in neighborhoods with no sewages, infant mortality rate skyrockets. The absence of the state in certain places (for instance, in the favelas of Rio de Janeiro, Brazil), hinders any possibility of social mobility.

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\(^3\)In the words of Cox (2009): ‘Dixit and Londregan show that, when the parties have no special relationships with any groups [...], the parties allocations are driven by the density of swing voters in each group as in the Lindbeck-Weibull model. As larger and larger asymmetries in the parties abilities to deliver benefits arise, however, the parties allocations are driven more and more by the core voter logic of promising benefits to those groups to which the party can most effectively deliver benefits.’ (Cox 2009: 7)
Public Goods, Collective Action and the role of Social Networks

There is a general consensus that parties face a tradeoff between clientelism and programmatic competition (see for example Keefer 2007, Lyne 2007). But existent research on clientelism has failed to address the question of why some small poor localities have more access to public investment than others in similar conditions. Furthermore in general these studies analyze dyadic relationships. So far research in this topic has payed little attention to the collective dimension, and even less to the political decision making process at the neighborhood level (Turner and Young 1985 and Calvo and Murillo 2013 are exceptions worth mentioning). More often than not, scholars have conceptualized vote choices as an individual decision. Yet scholars in Political Behavior often embrace theories that claim that the act of voting is, to some extent, a collective activity. In this paper, I argue that agents subject to political clientelism are particularly influenced by their neighborhood social environment, probably more than citizens who are less prone to mobilization efforts – middle and high income voters.

Due to the fact that the collective side has been neglected, there are no previous studies that successfully integrated theories of clientelism with the literature on public good provision, collective action and social networks. By definition a local public good represents a non-excludable benefit among the residents of a specific locality, ergo its non-excludability character requires us to evaluate how clientelistic linkages interact with coordination efforts. As well a public good is defined as non-rival (Samuelson 1954), and in this paper I do not consider the possibility of ‘crowding effects’. From the field of economics, public goods are generally portrayed as the summation of agents’ contributions, such as building a collective benefit through taxation (see Andreoni and McGuire 1993 for a complete overview). The Samuelsonian criteria considers the social optimal level of public good where the ratio of the marginal social cost of public and private goods production equals the ratio of the marginal social benefit of public and private goods production.

According to Olson (1965), individuals contribute to the provision of a public good as long as the extra benefit associated with his contribution exceeds the cost of contributing. This perspective identifies the solution to the free riding problem by modifying the incentives structure. Apart from the existence of hegemonic members and selective incentives, Olson highlights group size (smaller groups provide an advantage in terms of social punishment and rewards). Quite to the contrary, my model predicts that large groups will do better in terms of public goods provision. Yet, this finding arises due to the fact that the model does not consider the public good as a result of costly actions. Then, in this paper public goods are not linked to any wealth endowment or income contribution from the residents.

More importantly, in a small locality dominated by clientelistic politics, there is no direct translation between individual efforts and public goods. Not only, there is a third party, such as the government deciding how to allocate resources. But also, there are partisan politics determining especially which jurisdiction gets access to the investment. Even if we consider the act of voting or participating as entitling a cost, we cannot understand the sum of the efforts as a resulting collective benefit. In this study, we provide a theory describing the ‘black box’ or the mechanism that converts voters’ participation into local public goods. My research is consistent with studies linking economic development with community-based organizations (Ostrom 2000, Auerbach 2013). Explicitly, this paper highlights
the role that the social network plays in clientelism to intensify the accountability process bottom-up. In particular, demand for public investment manifest from dense political networks in small localities. These emerge from the social structure of the neighborhood and are assumed to be independent from political parties.

Scholars in Sociology, Political Science and Social Psychology have long studied the importance of the social environment in political behavior. Precisely is the interdependence among individuals what makes residents of the same neighborhood permeable to other people’s political choices (Marwell and Oliver 1993; Sinclair 2012). The neighborhood is portrayed as the main environment where political communication thrives, either by word of mouth, yard signs or painted walls (Huckfeldt and Sprague 1995). Thus, residents’ political behavior condition the information at the very local level. Since agents sanction or reward their neighbors for their political actions or opinions –filtered by their own viewpoints–behavioral contagion is understood as a learning process with social influence (Sprage 1982; McPhee 1963 and Huckfeldt and Sprague 1995). The following quote describes this idea in a nutshell:

‘Whatever the psychological mechanisms, the social and political consequences is much the same: the development of homogenous political preferences within small groups and along lines of close social ties connecting them. During a campaign political preferences are contagious over the range of personal contacts’ Berelson et al (1954: 122)

Within this framework, my theory conceptualizes the election experience as a group activity. Particularly in small communities, people do not perceive turn out as a individual experience; for example t-shirts with different colors are used to identify supporters and this brings a sense of belonging to a group (Remmer 2010). Voting, therefore, is a social experience, and so is politics in general. Recent evidence shows that citizens are often persuaded by their immediate social contexts, when taking political decisions (Baker, Ames and Renno 2006). In this vein, scholars have found that the effects of social pressure on turnout are statistically significant (Gerber, Green and Larimer 2008; Abrams, Iversen and Soskice 2010). Gerber and colleagues link higher turnout with the satisfaction of behaving in accordance with norms. These authors understand social pressure as praising ‘those who uphold norms or scorning those who violate them.’ (Gerber, Green and Larimer 2008). In order to believe that peers will scorn those who do not uphold to social norms, there has to be a belief or the perception that these political choices are public (Cialdini and Trost 1998; Lerner and Tetlock 1999; Cialdini and Goldstein 2004). The model in this paper assumes that voters in a small poor locality perceive themselves as being constantly monitored by political brokers and peers to the point to disbelieve the secrecy in the electoral process. Social pressure coincides with incentives to coordinate electorally towards the same candidate, so that the community will be rewarded with local public goods. In the following section, I describe a model aiming to fill the existent void in the literature.
Model

The following two-period game emphasizes the role of social pressure in clientelistic linkages. In the first stage, there is a bargain process between brokers and politicians. The latter offer resources to a community leader for clientelism, as well as commitments of future investment in his locality. In exchange, the leader endorses one candidate during the electoral campaign. Voters are mobilized by the leader. Neighbors interact with each other, observe the leader’s signals and act accordingly. The election takes place. Afterwards the elected politician resolves how much resources to allocate in local public goods (i.e. to what degree he will honor his promise). The game is repeated one more period and ends with the second round election. This model applies to one single locality, like a poor neighborhood or informal settlement (e.g. slum). The structure of the game is as follows:

Players

- Two political candidates $z = \{A,B\}$
- Broker or community leader $L$
- Total voters in the locality : $N$
- A subgroup $n \in N$, s.t. if voter $i \in n$, then $i$ belongs to $L$’s ‘machine’

Sequence of actions

1. Both candidates (incumbent and challenger) announce their commitments towards transfers and public goods, subject to a budget constraint. The commitment is an *ex ante* promise (no public good is delivered yet). But during the campaign, politicians do give out transfers for clientelistic purposes.

2. The leader decides which candidate in particular he will endorse and how much to distribute among the ‘machine’ voters.

3. The voters listen to the leader’s endorsement and choose a candidate.

4. After the election takes place, the elected politician chooses the actual level of local public good to invest.

5. The process repeats one more time and the game finishes with the end of the second electoral cycle.

In other words, the politicians need to decide *ex ante* how much money to provide to the broker (budget for clientelism) and the level of public investment being promised at this locality. The actual level of public good that the elected official delivers is decided *ex post* (in the period of time between
elections). Particularistic benefits are distributed during the campaign, hence before elections take place. Yet, there is generally a lag between when the voter delivers his vote and when the politician delivers the promised public good. In order to maximize their utility, candidates choose the bundle clientelism-public good that better suits them. The positive term in the politician’s utility function has to do with the vote share, and the negative terms are the expenditures on clientelism and local public goods. Then, the broker’s choice is about the total amount of resources to distribute for patronage needs, as well as which candidate to endorse. Both are a function of the credibility level of the politicians, the propensity that the voters have to vote for them—measured through valence—, the social network of the locality and the discount factors. Finally, the voters make their decision considering current clientelistic transfers (as well as future ones weighed by the discount factor), the promised public good, the candidate’s credibly, their level of affinity with the candidates and the social pressure (punish or reward) from his community.

Solution Concept

SubGame Perfect Equilibrium (SPE)

Introducing the parameters

\[
\begin{align*}
A \text{ chooses } & G^p_{At} \text{ client}_{At} ; B \text{ chooses } G^p_{Bt} \text{ client}_{Bt} \\
\downarrow & \\
L \text{ chooses } & b^* \text{ conditioned on endorsement (time } t) \\
\downarrow & \\
\text{voters decide their vote choice (time } t) & \\
\downarrow & \\
\text{Period between elections: elected politician spends } G_t & \\
\downarrow & \\
A \text{ chooses } & G^p_{At+1} \text{ client}_{At+1} ; B \text{ chooses } G^p_{Bt+1} \text{ client}_{Bt+1} \\
\downarrow & \\
L \text{ chooses } & b^* \text{ conditioned on endorsement (time } t+1) \\
\downarrow & \\
\text{voters decide their vote choice (time } t+1) &
\end{align*}
\]

Voter’s utility function

We present next the utility function for an arbitrary voter \(i\). Given that broker has decided to endorse candidate \(A\) (without loss of generality), voter \(i\)’s utility for choosing \(A\) is

\[
w_{it}(A|L : A) = \theta_{iA} + \frac{b}{1 - \delta} + \gamma + \rho \lambda_{At} + (1 - \rho)G^p_{At}
\]
And under the same assumption, his utility for choosing B is

\[ u_{it}(B|L : A) = \theta_{iB} + \rho \lambda_{Bt} + (1 - \rho) G^p_{Bt} \]

The valence term for voter i over candidate z (\( \theta_{iz} \)) represents the affinity that this particular voter has with a certain candidate. This could measure ideology or some general underlying preference, but it does not necessarily link policy dimensions or partisan attachment (Hinich and Munger 1994).

In terms of clientelism, voter i receives \( b \) for as long as he remains within the machine (i.e., complies with the leader’s suggestion). Defecting on the leader prevents the voter from getting the particularistic benefit (in this and all future rounds). Since I am assuming \( b \) is constant across time and beneficiaries, it does not have subscript i or t. Technically, politicians or brokers cannot observe the clients’ actions—due to ballot secrecy. For this reason, scholars oftentimes raise the problem of moral hazard. Kitschelt and Wilkinson (2007) argue that for clientelist linkages to emerge as an equilibrium these conditions should exist: predictability, monitoring and iteration. Similarly, Larreguy (N.d.) provides evidence from Mexico about how parties use electoral data to monitor brokers and control its clientelistic networks. Stokes and her colleagues (2004, 2005, 2013) present plenty of evidence from Argentina about the central role of monitoring to overcome commitment problems inherent to clientelism. Furthermore, brokers have different sophisticated techniques to circumvent the secrecy in elections. Nowadays, most of them involve photographing the ballot as a proof of loyalty. There is also evidence that group monitoring is frequently the choice of brokers, for example, through unions, religious groups, or even with soccer hooligans (Szwarcberg 2010). In this line, repeated iterations combined with monitoring through the social network helps the broker to dodge ballot secrecy. More explicitly network connectedness increases the probability of catching a defector. All in all, the relationship leader-neighbor is based on reciprocity, where material and non-material resources are exchanged. The following quote from recipient of clientelism illustrates how favors are exchanged in a bidirectional form:

‘I know that I have to go to [the politician’s] rally in order to fulfill my obligation to her, to show my gratitude. Because, if I do not go to her rally, then, when I need something, she won’t give it to me.’ (Auyero 2000:160)

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4 Apart from taking pictures with a cell phone, brokers often use pre-marked ballots, deliver carbon paper to record the vote choice, instruct voters to fold the ballot distinctively or demand voters to write their names—as in the Philippines. Finally, the most common technique worldwide is the ‘revolving ballot’ (called ‘the caterpillar’ in Russia, ‘lanzadera’ in the Philippines, ‘voto cadena’ in Argentina and ‘Tasmanian dodge’ in Australia). Despite some kind of variation from place to place, the procedure is the following: the first voter is given a fill-in or a partisan ballot, which he should introduce in the box. Then he should give the broker the blank ballot (or empty envelope) as a proof that he voted as expected. And from there the broker continues the chain. For more details see Schedler and Schaffer (2007), Kitschelt and Rozenas (2011) and Szwarcberg (2010).
The voters’ discount factor is $\delta$. This parameter indicates how much voters value receiving $b$ in the future. To the limit, if $\delta$ goes to 1, voters value future benefits as much as current ones. And if $\delta$ goes to 0, they discount the future greatly and they only perceive utility from receiving $b$ in the first period. I associate the latter situation with voters who are more resilient to patronage. In my model impatient implies less handout-dependence.

The core of my argument is that the social structure in a locality matters for the analysis of clientelism. As described in the literature, one of the main features of patronage is the problem solving network built between same locality residents, imbued with trust, solidarity, and caring. Let $\gamma$ be the value for connectedness in the social network: the higher the $\gamma$, the more well connected the nodes are. Since there is only one leader and he is highly influential (by assumption), the choice he makes works as a focal point, aiding coordination. My model assumes that neighbors learn about the political world from their leader, and this mechanism shapes their voting behavior. Ultimately, this process fosters electoral coordination towards the same candidate, so that the neighborhood is rewarded with local public goods. While leaders’ communications strongly influence followers’ beliefs about the world, often they have incentives to misrepresent the state of the world. In the words of Levi (2006):

‘Leadership aligns incentives, helps design and redesign institutions, provides the learning environment that enables individuals to transform or revise beliefs, and plays a major role in inducing preferences. Most importantly, leadership -both of government and within civil society- provides the human agency that coordinates the efforts of others.’ (Levi 2006:10)

In my model, voters assume that whoever the leader is endorsing, then he will be the majority’s choice. Therefore, choosing the leader’s candidate yields a social reward for this voter that will not exist if he votes for the other candidate. Alternatively, the absence of social reward can be understood as a punishment for not complying with the social norms (Cialdini and Trost 1998). The following quote is from an interview performed by Schaffer and illustrates clearly my point:

‘Otherwise, one lose even the friendship […] it is already an agreement, and obligation […] there are people here that feel obliged to vote because they did favors to them […] they have to go and vote, and if not, they stop talking to you, if you are sick, you die there, they do not even visit you […] There is the power, the favor to the individual’ Schedler and Schaffer (2007)

A useful proxy for this social pressure is $\gamma$ since the higher the value for connectedness, the higher the positive reward. When $\gamma$ is low, following the leader’s suggestion might still be coordination fostering (at least to some level), however since the nodes are not well connected, social reward matters less to each of the residents.

The term $\lambda_{zt}$ represents the credibility for candidate $z$ at time $t$. If politician $z$ was the incumbent, the credibility is defined by the distance between the promised and the actual level of public good delivered in the previous round. The credibility is generally negative and is maximized when

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5See Auyero (1999) and 2000 for a thorough description of the problem solving network in clientelism in Argentina.
the politician delivers as much as he promises during the campaign (in which case credibility is zero). If z has never been in office before, the assumption is that he gets an arbitrary fixed negative value, following the literature on incumbency advantage \cite{Erikson1971, Gelman1990, Cox1996, Katz1996, Mayhew2008}. Thus, \( \lambda_{zt} = -\phi \) if z was never elected before, or \(- (G_{zt-1} - G^p_{zt-1})^2 \) otherwise (considering the first immediate period he was incumbent before). The negative fixed value is associated to the uncertainty towards his future behavior.

The term \( G^p_{zt} \) is the promised public good while \( G_{zt} \) is the good that is later delivered. Whereas scholars of clientelism have mainly focused on private or club goods, in this model I emphasize the relevance of local public goods. While club goods cannot be withheld within a certain group (does not imply territorial limitation), local public goods are non-excludable within a geographic unit. The main difference is regarding the contingency of voting behavior. In my model, enjoying \( G_{zt} \) is non-contingent on having voted for z on period t-1. Hence, regardless of his action, every voter derives utility from the public good finally delivered. Thereupon, at the end of both utilities –either voting for A or B– voter i gets both promised public goods, weighted by each probability that the candidate will honor his commitment (\( P_{Zt} \)). As these terms appear in any case, they will not be relevant for our analysis.

The parameter \( \rho \) represents the degree to which the voter is retrospective (vis-à-vis prospective). Presumably \( \rho \) varies across voters, but for simplicity I assume that this value – a continuum range for retrospective-prospective evaluation – is the same for every i \( \in \mathbb{N} \). Provided \( \rho = 1 \) (fully retrospective), then in the voter’s utility the current promise is not relevant at all; whereas the credibility is the main factor of his evaluation. Alternatively, provided the voters do not consider politicians’ past actions for electoral assessments, then \( \rho = 0 \) (fully prospective). In the latter, the candidate’s credibility does not affect voting behavior, while the current promise is fully weighted in the voter’s utility. Otherwise, for values between 0 and 1, the voters entitle a combination of retrospective and prospective evaluations. This model builds upon different voting theories. The literature on retrospective voting is extensive – for a comprehensive review see \cite{Healy2013, Downs1957, Fiorina1981}.\cite{ Downs1957, Fiorina1981} argue voters decide estimating party’s future performance by looking into past performance, not campaign promises. Likewise, \cite{Downs1957, Fiorina1981} states challengers don’t influence voters: voters simply have a referendum on the incumbent, since challengers’ promises are not credible. Other authors argue in favor of prospective voting models: voters evaluate competing candidates based on what they expect from future conditions. Although expectations over the future are generally shaped by the past, there is a blurry line that separates these theories, we assume citizens weight both \cite{Lockerbie1992}. Finally, in my model voting is costless and abstention is not a possibility.

**Voter’s choice**

As the game ends with the second election, through backward induction, we start analyzing the voter’s dilemma at election t+1. Every player observe the voters’ choice. Most of the parameters are constant across voters and are common information for all players. Yet, for every voter i there will be a different valence term, which yields different voting conditions. The difference valence terms are
not possibly known by every player. However as I soon explain, the probability distribution of $\theta$ is common knowledge. This enables candidates and leader to speculate over the voters’ thresholds for electing one candidate over the other one. Now, assuming (W.L.O.G.) that the leader chose to endorse candidate A, then voter $i$ will vote for A if and also if:

$$\theta_{iA} + \frac{b}{1-\delta} + \gamma + \rho \lambda_{At+1} + (1-\rho)G_{At+1}^p \geq \theta_{iB} + \rho \lambda_{Bt+1} + (1-\rho)G_{Bt+1}^p$$

The only parameters that have time subscriptions are those corresponding to candidates’ credibility ($\lambda$). The other terms remain constant through time (there is no difference between $\theta_{iAt}$ and $\theta_{iAt+1}$). After rearranging, voters follow the leader’s suggestions as long as the following condition holds

$$\theta_{iB} - \theta_{iA} \leq \frac{b}{1-\delta} + \gamma + \rho (\lambda_{At+1} - \lambda_{Bt+1}) + (1-\rho)(G_{At+1}^p - G_{Bt+1}^p)$$

Assume for a moment that the candidates’ credibility and promises do not differ. Then, if both the peer pressure (approximated by $\gamma$) and the particularistic benefit $b$ (discounted for future rounds) are sufficiently high to outweigh any affinity to the other candidate (valence for the one not endorsed by the leader), then the leader’s job to induce voting behavior is not challenging. How responsive are voters to clientelism is referred in the literature as ‘vote choice elasticity’ ([Kitschelt and Wilkinson 2007](#)). In this case, I assess this elasticity both in terms of handout-dependent (through the discount factor) and the relative weight of peer pressure ($\gamma$).

Let $\theta_B - \theta_A = \theta_i$ so that

$$\theta_i \leq \frac{b}{1-\delta} + \gamma + \rho (\lambda_{At+1} - \lambda_{Bt+1}) + (1-\rho)(G_{At+1}^p - G_{Bt+1}^p)$$

The interpretation for $\theta_i$ is that it represents how much $i$ prefers candidate B over A (assuming A has the leader’s blessing). Provided $\theta = 0$, voter $i$ is indifferent in terms of valence between A and B (likes both candidates equally); if $\theta < 0$, voter $i$ has more affinity for candidate A. Each voter for which the statement above is true will be considered part of A’s vote share. Thus, we could add every voter who meets this condition if we knew $\theta$’s probability distribution.

Following ([Persson, Roland and Tabellini 2000](#)), let

$$\theta \sim Unif\left[\frac{-1}{2\gamma}; \frac{1}{2\gamma}\right]$$

To be able to use probabilistic voting models, I adopt the simplifying assumption that $\theta$ is uniformly distributed on that particular interval and independently distributed across citizens. The parameter $\gamma$ (level of connectedness in the social network) is used here a proxy for the degree of preference homogeneity within the locality. If $\gamma$ is high, $\theta$ is distributed uniformly across a small interval. Arguably, there is a difference between homogeneity of preferences and level of connectedness. However, theories of *conformism* in social psychology describe the tendency of behaving ‘everyone else’ is behaving, since one’s utility, the theory goes, declines with the distance between others’ actions and our own.
Additionally, building on the literature on Coevolutionary Opinion Formation Games (see for example DeGroot 1974; Bhawalkar, Gollapudi and Munagala 2013), the model assumes high correlation between homogeneity of preferences and level of connectedness. The logic behind this assumption is that every agent has incentives to minimize the differences in opinions among other nodes in the social network, so that consensus is formed relatively fast within well connected communities. In order words, as \( \gamma \) decreases, the interval for the uniform distribution of \( \theta \) increases, showing more dispersion in the network’s preferences over the candidates.

**Calculating the vote share**

Assuming that \( \theta \) is uniformly distributed is convenient as we can employ the cumulative distribution to estimate the vote share for the candidate endorsed by the leader. Then, given that the leader instructed to vote for candidate A (by assumption), the vote share of candidate A is

\[
\begin{align*}
\text{vote share of candidate A} &= \frac{b}{1 - \delta} + \gamma + \rho(\lambda_{At+1} - \lambda_{Bt+1}) + (1 - \rho)(G^p_{At+1} - G^p_{Bt+1}) - \frac{1}{2} \\
&= \frac{b}{1 - \delta} + \gamma + \rho(\lambda_{At+1} - \lambda_{Bt+1}) + (1 - \rho)(G^p_{At+1} - G^p_{Bt+1}) + \frac{1}{2} \\
&= \gamma \left[ \frac{b}{1 - \delta} + \gamma + \rho(\lambda_{At+1} - \lambda_{Bt+1}) + (1 - \rho)(G^p_{At+1} - G^p_{Bt+1}) \right] + \frac{1}{2}
\end{align*}
\]

This is common knowledge to every player. Proceeding with backward induction, we may estimate how the community leader uses this information.

**Broker’s utility function**

As assumed before (W.L.O.G.) the leader endorses candidate A, then his utility in this case is

\[u_L(A) = \kappa + client - n \ast b = \kappa + \tau\]

The first term \( \kappa \) refers to the social reward that the leader receives from the people in his neighborhood, after delivering the public good (a way of being legitimized as leader).

\[\kappa = f(G^p_z, \lambda_z)\]

The following quote illustrates some important features that a community leader pursues:
'Accordingly, candidates often recruit intermediaries who are respected members of their communities, or others to whom recipients feel bonds of personal accountability. In Taiwan, vote brokers typically approach only relatives, friends, and neighbors. A similar tactic is commonly employed in Thailand. In the 1992 election, for instance, campaign workers for one candidate sought in each village to recruit the person best placed to deliver support, generally someone with significant social status in the village. Other qualifications include being respectable, well known, a local leader (either official or unofficial), the candidate’s relative or close friend, or some other characteristics that would make people honour their vote promises’ (Schedler and Schaffer 2007).

The second term *clien* represents the total transfer of resources that the broker receives from the politician. From this budget the broker will have to spend resources to distribute among the ‘machine voters’, and the keep the remainder for himself. By assumption b is constant over time and among citizens, so the broker will have to spend b * n (per capita particularistic benefit times the size of the leader’s core), in any of the rounds. The net payment for the broker is τ = (c* btn). The value of this transfer (or broker’s salary) can be negotiated between broker and politician. Presumably in a case of broker monopoly, the broker will demand a very high τ.

At this stage of the game, the leader’s choice is about the level of particularistic benefit to distribute. His utility function is monotonically decreasing on b, so without any constraint, the leader will decide to spend b=0 . Brokers often also have distinctive interests that lead them to expropriate or misallocate the cash or goods they are supposed to distribute to voters. Despite the fact that politicians tend to prefer to maximize vote share (subject to some budget constraint), the broker’s is a expenditure-minimization problem. He needs to estimate the minimum level of resources to attain a certain vote share, demanded by the candidate he’s endorsing. The latter works as a constraint for the broker’s minimization problem.

Indirectly, the choice of resources to be spent is a function of the valence and credibility of the politician that he is endorsing. It is extremely important for the leader to be able to deliver at least as many votes as the politician requests from him, as his ‘job as broker’ depends on this performance. This is exactly what prevents the leader to grab all the resources and distribute zero. The extreme case where b=0 could be for example when the broker is planning to move to a different slum or stop working in politics, but this particular situation is not modeled in this paper.

The broker has the information on neighbors’ preferences and on the network parameters, so he can estimate the minimum particularistic benefit (per capita) sufficient to attain at least the vote share demanded by the politician (defined in the model as X, assuming X ≥ 51%). Clearly the electoral system could affect the desired X. Without the simplifying assumption that there are two candidates and only one gets elected, more complex scenarios could interact with the electoral system, such that different incentives emerge. For example, if this locality were part of a bigger electoral jurisdiction and the election was actually legislative (e.g. councilmen), in this case PR incentives would induce politicians to be vote-share maximizers. But according to this model, the incentives are similar to those in Single Member District, where 51% is enough. Nonetheless, there are different circumstances
where politicians seek higher vote share than 51%, even in majoritarian systems. For instance, super majorities are sometimes sought to signal strong power, either internally or externally. Likewise, in authoritarian regimes, rulers often seek to attain overwhelming victories to intimidate the opposition, try to legitimize the election or solve power struggle inside the ruling coalition (Magaloni 2006, Simpser 2013).

Broker’s choice with vote share constraint

The leader needs to comply with his job, such that

$$\gamma \left[ \frac{b}{1-\delta} + \gamma + \rho(\lambda_{At+1} - \lambda_{Bt+1}) + (1-\rho)(G^p_{At+1} - G^p_{Bt+1}) \right] + \frac{1}{2} \geq \frac{X}{100}$$

It is relevant to discuss now a distinction of brokers’ types. On the one hand, we may find opportunist brokers seeking to make short-term material gains during the course of a campaign. This type of broker are not considered in this paper. On the other hand, clientelist brokers wish to build or maintain long-term relations. My model depicts the latter type. Therefore to maximize his utility, the leader chooses the minimum particularistic benefit $b$ satisfying the above condition (vote share constraint), yielding

$$b^* = (1-\delta) \left[ \frac{X-50}{100} - \gamma + \rho(\lambda_{At-1} - \lambda_{Bt+1}) + (1-\rho)(G^p_{Bt+1} - G^p_{At+1}) \right]$$

Then regardless of how much resources the politician provides, the leader knows he needs to spend at least $b^*$ per capita, for every voter following his suggestion. A similar way of understanding this process is the following: the broker “owns” a certain number of votes (i.e. everyone in his ‘machine’ follows his suggestion). With this information in mind, the broker offers his service to the candidate, demanding a certain amount of money. The broker knows the credibility of the candidate, his current promise and the probability distribution of the valence term for his voters. Therefore, with all that information in mind, the broker estimates a budget for the politician. In other words, the broker says ‘I own these many votes, given your profile, my services will cost you this amount of money’.

Arguably, the brokers who ‘own’ the largest network will be able to extract more rents from clientelism. However, in my model, if the locality’s social network is more well connected, the broker will be receiving the same resources. This occurs due to the fact that the politician adjusts his payment downwards. This dynamic makes sense because and gamma is an exogenous parameter in the model, known by every player. Thus, the candidates know exactly how much they need to spend in clientelism (given their profile). This is coherent with the idea that brokers have incentives to inflate their influence power to the politicians (particularly, in cases where there is competition among brokers). One may argue that in a perfect information context, politicians do not need to rely on brokers at all. Nevertheless, information is not the only resource brokers provide politicians. The broker in my model is the community leader, who behaves as a delegate demanding local public goods (i.e. informs the
candidates what public services voters value the most or are in need of). More importantly, brokers are in charge of distributing the clientelistic resources and enforcing the monitoring system.

Since the valence term and the clientelistic benefit are independent on each other, this model does not get into the puzzle of ‘swing’ versus ‘core’ in depth. The main conceptualization is in terms of the voters who belong to the leader’s machine. The assumption is that L distributes resources among those who belong to his network. Alternatively, the residents claiming to the leader that will vote for his candidate, enter the group of ‘machine voters’. Presumably lying is not a feasible alternative, because of the monitoring and enforcing mechanism (Auyero 1999, 2000; Stokes et al. 2013). Therefore, from 1 to n, every i voting for A (given that L endorses A) will receive $b^*$ as long as i does not defect on the leader.

**Politician’s choice**

In this section, will analyze how politicians determine how much resources to allocate between clientelism and public goods. By a simplifying assumption let A be the incumbent politician, and the candidate endorsed by the broker. Then, A seeks to maximize his expected utility at the second round first (by backward induction). This includes the amount of resources spent in the period between elections ($G_t$), his vote share for elections at $t+1$, as well as the clientelistic costs at $t+1$.

$$u_{At+1} = -G_{At} + \alpha(voteshare_{At+1} - clientelistic_{At+1})$$

The negative terms are the budget allocated to clientelism and the investment in public goods. The second round is weighted by $\alpha$, the politician’s discount factor (presumably close to 1 since there are only two rounds). Now, replacing the terms of vote share by the expression we already calculated (common information to every player), the utility for the second round is

$$-G_{At} + \alpha \left[ \gamma \left( \frac{b}{1 - \delta} + \gamma + \rho(\lambda_{At+1} - \lambda_{Bt+1}) + (1 - \rho)(G_{At+1}^p - G_{Bt+1}^p) \right) + \frac{1}{2} - nb - \tau \right]$$

As we assume this candidate is the incumbent, the credibility for the second round is $\lambda_{t+1} = (G_t - G_{t-1})^2$. The credibility at time t is evaluated over actions in the previous round (t-1) as retrospective voting theory suggests. So, $\lambda_t$ is the difference between the good he actually delivered in the previous period ($G_{t-1}$) and what he had promised during the campaign before that ($G_{t-1}^p$). If the politician was never incumbent then, there is special case for the challenger addressed on the appendix. By assumption, B is the challenger and gets a fixed negative value - $\phi$ because of the uncertainty (coherent with the literature on incumbency advantage).

Returning now to the politician’s utility function, we can plug in the value of b which was already determined by the broker. As we are doing backward induction, the politician observes the optimal level of resources spent per machine voter. As well, the politician knows that any extra resources allocated to clientelism will only increase the net payment of the broker, directly increasing transfers $\tau$. Hence, the candidate’s hands are tied over the clientelistic expenses, he can only determines the optimal $\tau$ as
a salary for the leader. Then, the candidate needs to maximize vote share while minimizing expenses. By plugging in all the known terms in this utility, we will be able to solve for the optimal $G_t$ that yields the higher utility for the politician. Replacing $b$ by the value of $b^*$ previously determined, the utility is

\[-G_{At} + \alpha \left[ \frac{\gamma(1-\delta)}{100\gamma} \left( \frac{X - 50}{100\gamma} - \gamma + \rho(\lambda_{Bt+1} - \lambda_{At+1}) + (1 - \rho)(G_{Bt+1}^p - G_{At+1}^p) \right) + \gamma^2 
  + \gamma \rho(\lambda_{At+1} - \lambda_{Bt+1}) + \gamma(1 - \rho)(G_{At+1}^p - G_{Bt+1}^p) + \frac{1}{2} 
  - n(1 - \delta) \left( \frac{X - 50}{100\gamma} - \gamma + \rho(\lambda_{Bt+1} - \lambda_{At+1}) + (1 - \rho)(G_{Bt+1}^p - G_{At+1}^p) \right) - \tau \right] \]

Now, after some simplification, we replace $\lambda_{At+1}$ by $-(G_{At} - G_{At}^p)^2$ for the incumbent and $-\phi$ for the challenger, such that the candidate’s utility at this stage is

\[-G_{At} + \alpha \left[ \frac{X - 50}{100} \left( 1 - \frac{n(1 - \delta)}{\gamma} \right) + \frac{1}{2} + n(1 - \delta)\gamma - n(1 - \delta)\rho(G_{At} - G_{At}^p)^2 
  + n(1 - \delta)\rho\phi - n(1 - \delta)(1 - \rho)(G_{Bt+1}^p - G_{At+1}^p) \right] - \tau \]

In stead of simplifying first, I keep only the relevant terms. The politician’s goal is to maximize this expression with respect to $G_t$. After some simplification, the only terms involving $G_t$ are

\[-G_{At} + \alpha \left[ - n(1 - \delta)\rho(G_{At} - G_{At}^p)^2 \right] \]

Taking the first order condition with respect to $G_{At}$ and rearranging the terms yields the optimal level for the candidate to invest after the election at time $t$:

\[ G_{At} = G_{At}^p - \frac{1}{2} \frac{n}{\rho} \frac{1}{(1 - \delta)} \frac{1}{\alpha} \]

It is useful to read this expression

\[ \frac{1}{2} \frac{n}{\rho} \frac{1}{(1 - \delta)} \frac{1}{\alpha} \]

as a ‘lying’ factor (the ‘misrepresenting’ part of the promised level of public good investment). Since at this instance, the promised level of public good is taken as given (the politician communicated the level for GP before the first-round election). Therefore, after taking $G_{At}^p$ as fixed, interesting
comparative statics arise from analyzing how the core size (n), the degree to which voting evaluation is ‘retrospective’ (ρ), and both discount factors (α, δ) affect the candidate’s margin for not honoring campaign promises. The most obvious one is that the more ‘prospective’ the voters are, the less politicians care about keeping commitments. Therefore, the size of the ‘lying factor’ increases when ρ decreases.

$$\lim_{\rho \to 0} \frac{1}{2n\rho(1-\delta)\alpha} = \infty$$

The immediate implication of this is that when politicians greatly dishonor their commitment, then the public investment goes to zero in the limit.

Now, at this stage the politician also has to decide the level of promised public good to invest in the next term ($G_{At+1}^p$). Taking into consideration the candidate’s utility function below, it seems that his current choice for public good commitment is trivial (assuming some positive degree of ‘prospective evaluation’).

$$-G_{At} + \alpha \left[ \frac{X - 50}{100} \left(1 - \frac{n(1-\delta)}{\gamma}\right) + \frac{1}{2} + n(1-\delta)\gamma - n(1-\delta)\rho(G_{At} - G_{At}^p)^2 \right.$$

$$\left. + n(1-\delta)\rho\phi - n(1-\delta)(1-\rho)(G_{Bt+1}^p - G_{At+1}^p) - \tau \right]$$

The utility function is monotonically increasing on $G_{At+1}^p$ and since the game finishes after this election, there would be no constraint for the politician. However, ending the game here is arbitrary, which results into an unrealistic finding (unlimited choice of $G_{At+1}^p$). Actually, politicians’ careers often continue after this point, even when they cannot run again for this particular office. Hence, it is fair to assume that when this game ends, politicians will still care about their careers and they will pay attention to their credibility. Therefore, I conclude that $G_{At+1}^p$ will be high but feasible, still a credible commitment.

**First period**

Following with backward induction, now we proceed to the end of the first round: the election at time t. Then, by repeating the same procedure, we estimate candidate A’s vote share for the first period’s election as

$$\gamma \left[ \frac{b}{1-\delta} + \gamma + \rho(\lambda_{At} - \lambda_{Bt}) + (1-\rho)(G_{At}^p - G_{Bt}^p) \right] + \frac{1}{2}$$
Then, the broker’s choice is still constrained by the politicians’ request to reach a vote share at least of X%. Again the leader chooses the minimum level of per capita benefit to distribute as
\[ b^* = (1 - \delta) \left[ \frac{X-50}{100 \gamma} - \gamma + \rho (\lambda_B - \lambda_A) + (1 - \rho)(G^p_B - G^p_A) \right] \]

Finally, the first stage of the game is the politician’s choice regarding the expenses in the campaign at time t. At this time, the candidate cannot affect his current credibility, cannot chose the level of public good (both promised and spent) at time t-1 as \( G_{t-1}^p \) and \( G_{t-1} \) were defined before this game starts. At this point, the politician’s choice is the amount of resources spent towards clientelism and the level of public good to promise now (\( G_t^p \)). First, the clientelism resources do not depend on him, again, the candidate needs to set aside \( n \) times \( b^* + \tau \) for the leader. Both these expenses and his vote share, everything in the present utility is about his current credibility (which is in terms of his past actions), as well as the current promise (to be delivered in the period between elections). The politician’s utility function at time t is:
\[ u_{At} = \text{voteshare}_t - \text{cien}_t \]

After replacing parameters for known expressions, rearranging and simplifying, we get
\[ u_{At} = \frac{X - 50}{100} \left( 1 - \frac{n(1 - \delta)}{\gamma} \right) + \frac{1}{2} + n(1 - \delta)\gamma - n(1 - \delta)\rho(G_{t-1} - G_{t-1}^p)^2 \]
\[ + n(1 - \delta)\rho\phi - n(1 - \delta)(1 - \rho)(G^p_B - G^p_A) - \tau \]

Therefore, assuming there is some level of ‘prospective’ evaluation, the candidate’s utility monotonically increases on the level of promised public good. Considering that we already solved for the actual level of public good that he will spend between elections (\( G_t \)) as an expression in terms of the promise, we now need a constraint to solve for \( G_t^p \). Given that the candidate knows that he will not be able to spend more than the available resources, the model considers a budget constraint such that
\[ G_{A,t} + \text{cien}_t \leq \text{Budg}_t \]
or
\[ G_{A,t} \leq \text{Budg}_t - nb - \tau \]

\[ ^6 \text{This model does not consider taxation and takes the budget as exogenous. Future research should devote attention to preferences for bundles over tax rates and public good provision.} \]
Since we know his choice for $G_{A,t}$ (in terms of the promise):

$$G_{A,t} = G_{A,t}^p - \frac{1}{2n\rho(1 - \delta)\alpha}$$

We can replace $G_{A,t}$ in the previous inequality, obtaining

$$G_{A,t}^p - \frac{1}{2n\rho(1 - \delta)\alpha} \leq Budg_t - nb - \tau$$

Now we plug the value of $b^*$ that we estimated before,

$$G_{A,t}^p \leq Budg_t - n\left[(1 - \delta)\left(\frac{X - 50}{100\gamma} - \gamma + \rho(G_{At-1} - G_{At-1}^p)^2 - \rho\phi + (1 - \rho)(G_{At}^p - G_{At}^p)\right)\right] - \tau + \frac{1}{2n\rho\alpha(1 - \delta)}$$

Simplifying,

$$G_{A,t}^p + (1 - \rho)G_{A,t}^p \leq Budg_t - n\left[(1 - \delta)\left(\frac{X - 50}{100\gamma} - \gamma + \rho(G_{At-1} - G_{At-1}^p)^2 - \rho\phi + (1 - \rho)G_{Bt}^p\right)\right] - \tau + \frac{1}{2n\rho\alpha(1 - \delta)}$$

we get

$$G_{A,t}^p \leq \frac{1}{2 - \rho} \left[Budg_t - n\left[(1 - \delta)\left(\frac{X - 50}{100\gamma} - \gamma + \rho(G_{At-1} - G_{At-1}^p)^2 - \rho\phi + (1 - \rho)G_{Bt}^p\right)\right] - \tau + \frac{1}{2n\rho\alpha(1 - \delta)}\right]$$

To sum up, we estimate that the value for the promised public good expenditure at the first stage of the game cannot exceed the following expression

$$\frac{1}{2 - \rho} \left[Budg_t - n\left[(1 - \delta)\left(\frac{X - 50}{100\gamma} - \gamma + \rho(G_{At-1} - G_{At-1}^p)^2 - \rho\phi + (1 - \rho)G_{Bt}^p\right)\right] - \tau + \frac{1}{2n\rho\alpha(1 - \delta)}\right]$$

As the theory expects, for lower values of $\rho$ (sufficiently ‘prospective’ voters), the promise at this stage goes infinity. In addition, this value for the promised level of public good also increases with $\gamma$. 
Comparative Statics and Analysis

The comparative statics from the previous model show some interesting effects of the networks level of connectedness. First, the latter negatively impacts the costs for clientelism. A higher level of connectedness (ceteris paribus) represents an easier job for the broker, lowering the costs for clientelism. The private benefit that the broker has to distribute within the machine voters is a decreasing function on $\gamma$. In other words, for well connected slums, the broker’s job is simplified, through the social pressure mechanism, and in consequence, the level of per capita transfer is reduced, all else equal. Second, the level of connectedness indirectly affects the politician’s choice of public good provision, since by lowering the costs of clientelism, candidates possess more resources available to allocate to public services. Also interesting —although not very surprising— is that the higher the size of the ‘machine core’, the closer $G_t$ will get to $G^p_t$ (honoring the campaign promises). The intuition is that by matching and delivering almost the promised public good, the credibility for next period increases. Since higher credibility means lower particularistic benefit, delivering public goods is an alternative for a politician that cannot afford distributing benefits within a large $n$ of ‘machine voters’. The politician may choose to distribute less resources individually (clientelism) by compensating through increasing his credibility (through more investment in public good). This story is coherent with the literature about public good spending: the higher the $N$ (although $N \neq n$), the higher increasing electoral payoffs of public good investment [Keeler and Vlaicu 2008]. As described by Gehlbach [2013] “the optimal level of public-goods provision is increasing in the size of the winning coalition and decreasing in the price of public-goods provision”. Although, my results somehow contradict the finding in Stokes et al. [2013] that bigger groups will be targeted for benefits more intensively than small groups. Olson [1965] also predicted that the problem of free riding will be ameliorated with smaller groups. Furthermore, from classic economic theories, the premise is that for sufficiently large groups, the crowding costs outweigh the benefits of sharing the costs with more people. The findings in my model are consistent with this concept. However, the size that matters in this paper is size of the group of ‘machine voters’ (the leader’s clientelistic network). The largest this group is, the more expensive clientelism results. Consequently, public good investment has a comparative advantage over clientelism for strong machines.

In terms of the discount factors, in this particular case with only two rounds, it is assumed that the candidate’s discount factor ($\alpha$) is very close to 1, therefore does not interfere in the decision. Naturally, in the extreme case, where $\alpha \Rightarrow 0$ (the politician is very impatient), then he may choose to invest very little, almost nothing such that $G_t \Rightarrow 0$. Now, about the voter’s discount factor ($\delta$) it was unexpected in my model that when voters value the future considerably less than the present (low $\delta$), they force politicians to invest in the local public good. This might be counterintuitive at first, yet it makes sense if we think of ‘patient’ voters (high $\delta$) as those relying on the particularistic benefit to survive. Arguably, poorer voters or poorer localities value the future $b^*$ as much as the present $b^*$, since they do not see themselves being able to scape from the need of whatever $b^*$ is (e.g. food aid) [On the other hand, a low $\delta$ means a certain independence from future $b^*$ such that these voters can afford to demand local public goods. Imagine for instance a locality whose residents are already experiencing upward social mobility and do not picture themselves relying heavily on future provision].

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7In the words of Kitschelt and Wilkinson (2007: page 25): ‘Discount rates. Poor people cannot wait for material rewards and therefore prefer targeted handouts to the distant benefits of policy change.’
of a particularistic benefit such as a bag of food. These voters will likely coordinate towards a better scenario, being able to pose a credible threat to brokers and politicians if they do not deliver the desired public services. Hence, for lower values of delta (higher independence from clientelism), voters are able to set their minds into local public goods, which in consequence yields to larger investments from politicians. In other words, for richer slums, or those experiencing constant improvements, the value of the clientelistic good decreases in relation to the value of the public good and politicians are required to comply in those new terms. Whereas extremely poor slums are handout-dependent ($\delta$ going 1), resulting in public goods being less profitable strategy in those localities. The politician chooses to invest almost zero in those slums, because those voters cannot effectively demand for public goods. Alternatively, voters cannot pose a credible threat to punish the incumbent, thus politicians rarely honor their commitments and public good provision is extremely limited. As Keefer and Vlaicu (2008) note ‘It is well-known that repeated interaction, sufficiently low discount rates and observable actions can lead to credible commitments’. In my model, this referred credible commitment corresponds to the clientelistic relationship between broker and voter. Moreover, there is another mechanism affecting the overall welfare of poor residents. This model comparative statics show that not only the poorest among the poor are expected to receive less public goods, but also, the particularistic benefit (per capita) decreases with their level of clientelism-dependence (high delta). Just to illustrate what occurs to the limit:

$$\lim_{\delta \to 1} b^* = \lim_{\delta \to 1} (1 - \delta) \left[ \frac{X - 50}{100\gamma} - \gamma + \rho(\lambda_{Bt+1} - \lambda_{At+1}) + (1 - \rho)(G_{Bt+1}^p - G_{At+1}^p) \right] = 0$$

In this line, the clientelistic handout ($b^*$) decreases as well on the credibility of the candidate the leader chooses to endorse, since L is aware that he will have to spend more resources (per capita) for a candidate with worse credibility. Naturally this mechanism is weighted by the degree of retrospective evaluation of voters. So for example in cases where voters are almost entirely prospective evaluators, a bad credibility does not increase the cost of clientelism. In this case, though, what will greatly determine the cost is the size of promise. For cases where voters are prospective to some degree, by increasing the level of public good commitment (relatively to the other candidate’s promise) candidates could lower clientelistic costs.

Finally, the findings regarding the degree to which voters are ‘retrospective evaluators’ is trivial: when $\rho$ goes to zero (‘no memory’ property), the lying factor increases up to the point, where the level of investment ultimately delivered is insignificant. This idea is consistent with Keefer and Vlaicu (2008) who find that when credibility is costless (or absence of credibility) public good spending tends to the lowest value. Likewise, ceteris paribus, the campaign commitment for public investment increases monotonically with the level of ‘prospectiveness’. This means that what really increases is not the final provision, but the margin for lying or inflating the promise.
Alternative setup

So far the model portrayed the case with the existence of one single leader. Now is worth analyzing a particular case, quite different from a broker’s monopoly. In this case, either there are several leaders but none of them is sufficiently influential to mobilize the whole network, or there are no leaders at all. Then, if no broker is sufficiently strong to behave as a focal point, how does the coordination problem will be solved? My answer is that for cases where \( \gamma \) is sufficiently high, every neighbor may anticipate others’ voting behavior and, consequently, estimate what is going to be the majority’s choice. In the previous section, the leader’s endorsement work as a signal for which candidate will be most likely chosen in that locality. Now, without a strong leader, the high level of connectedness in the social network could aid coordination. In this sense, \( \gamma \) is also a proxy for informational flow within the neighborhood. This assumption builds upon the literature on Information Aggregation (see for example Lohmann (1994) who argues that an activist’s political action works as a cue for other agents to gather information). Both Aldrich (1995) and Kitschelt and Wilkinson (2007) see the political parties as means of solving the collective action problem. Nonetheless, in my analysis parties are not enough: a strong social network is necessary to assure fast informational flow so that residents in the locality are able to coordinate. Then we can still look for the conditions under which voter i will vote for whom the majority is choosing. Assuming a sufficiently high informational flow and that voter i receives signals that the majority will likely vote for candidate A, then i votes for A as long as this expression holds:

\[
\theta_B - \theta_A \leq \rho(\lambda_{At+1} - \lambda_{Bt+1}) + (1 - \rho)(G^p_{At+1} - G^p_{Bt+1}) + \gamma
\]

Hence, A’s vote share during the second round is

\[
\gamma[\gamma + \rho(\lambda_{At+1} - \lambda_{Bt+1}) + (1 - \rho)(G^p_{At+1} - G^p_{Bt+1})] + \frac{1}{2}
\]

Conceivably if \( \gamma \) is sufficiently high, then strong leadership will eventually emerge in agreement. This idea makes sense particularly based on Michels (1915) Iron Law Of Oligarchy. However, I believe this case is interesting enough and worth exploring as there is a period when the social network starts building itself, \( \gamma \) may reach a certain level, but still no leader is able to claim legitimacy. The assumption does not even require the absence of clientelism, but rather that if particularistic benefits are distributed, the voter’s choice does not depend on that. The key word here is monitoring, so that with no broker there is no clientelistic structure to enforce the exchange. In other words, if the politicians distribute resources and defecting occurs nobody will be telling on the defectors. Hence, the vote choice is no longer a function of b. This scenario might even occur in the presence of social leaders who remain sufficiently independent from partisan structure so that they do no turn into brokers or mediate in favor of any politician.
Notably, $\gamma$ is still the social reward but not for doing what the leader is saying but for presumably following the majority. To contradict this assumption, one might think of special case where connectedness is high in the network but there is no general consensus over who to elect. This could occur for example in a highly polarized neighborhoods (for instance along the line of ethnic divisions). However, this implies different levels of connectedness per group. If there are subgroups $S$, then there are as many $\gamma_s$ as many $S$ exist. As explained previously the literature on Coevolutionary Opinion Formation Games describes how the nodes in a social network tend to express similar opinions, forming consensus relatively fast within well connected communities. Therefore, we could assume $\gamma$ (connectedness) is positively correlated with the probability of forming the minimum required group (coordinating a simple majority towards one candidate). This idea is consistent with Kuran (1989) who highlights the relevance of the collective sentiment in the declaration of preferences (vis-à-vis the private preference). The model assumes that once a voter declares how he is going to cast the ballot, he does precisely so (due to the perception of lack of secrecy), in spite of ‘compromising his integrity’, in Kuran’s words.

**Politician’s choice with no broker**

Similar to the previous case, the candidate maximizes his utility and solves for the optimal level of public good investment, such that

$$G_t = G_t^p - \frac{1}{\gamma^2 \rho \alpha}$$

The interesting questions is whether this candidate chooses to spend resources in clientelism or not. My model predicts that in order to maximize his utility, the candidate’s best strategy is to spend his budget entirely in the public good provision. Assuming $client_t = 0$, then his decision about $G_t^p$ (the promise at the first stage of the game) is trivial. During the first campaign, he will know that the investment finally delivered cannot be greater than his budget, such that

$$G_t \leq Budg_t$$

$$G_t^p - \frac{1}{\gamma^2 \rho \alpha} \leq Budg_t$$

$$G_t^p \leq Budg_t + \frac{1}{\gamma^2 \rho \alpha}$$
Analysis for alternative setup

Interestingly, in the no-broker environment (absence of clientelistic structure), the level of connectedness directly affects the level of public good provision. This process occurs in the expected direction, for tighter networks we anticipate higher investment from the government in public services, since these localities entitle higher power of coordination to either punish or reward politicians for their past actions. The assumption in this case is that the level of connectedness is sufficiently high such that neighbors are able to estimate the majority’s choice. Now, within these cases, the more well connected they are, the more they will be able to demand public investment from politicians. Among other factors, this result refers to the fact that politicians rely on their credibility, as consensus in the neighborhood is assumed to emerge fairly quickly, for high level of connectedness – the voters can credible commit to vote against untrustworthy incumbent. In other words, if a politician does not deliver as promised, it is quite easy for this type of social network to organize themselves and move altogether to a new candidate (the ‘lying’ factor decreases with \(\gamma\)). More importantly in this case, factors such as social pressure and network strength do not play in favor of the machine, but work in the community’s advantage.

Similarly, for lower level of connectedness, we expect less investment in public services. This is coherent with the literature on Social Capital (Putnam [2000]), in which the challenge for collective action increases for low levels of bonding and bridging social capital. My finding is also consistent with Keefer [2011] who argues that when citizens act together to hold politicians accountable, the latter will credibly commit to the public investment. All in all, without a broker, the network degree of tightness is what can act as a credible threat so that politicians honor their commitments. Finally, the parameter \(\rho\) plays the same role as in the previous set up: politicians tend to dishonor their promises more frequently for high levels of ‘prospective’ voting behavior.
Characterization of neighborhoods

The main argument in this paper is that social network features directly affect the balance of power and the type of interaction between the three main actors: voters, brokers and politicians, and consequently determines access to public services. Building upon the findings in the formal model, we distinguish two main relevant factors in the political organization of the slum, affecting the likelihood or accessing better public services. The first one, is the existence of a strong leader, which in network analysis can translate into centrality measure of this particular node or agent. Estimating the centrality measure for the main leader –or for all leaders– is the first step towards defining the brokerage market. For one strong leader, the centrality measure is high leading to a broker monopoly. Whereas low centrality is associated with two or three –or even more– leaders, which depicts a scenario of brokers competition. In this line, centrality characteristics of the network affects the bargaining power of leaders when facing bottom-up demands, as well as when transmitting these demands to local politicians and negotiating for resources to their particular locality.

The second relevant dimension in the social structure is the level of connectedness between residents, or in other words, how tight is the community. Measuring how well connected are the voters of the same locality, and how often they discuss politics improves our understanding of the informational flow inherent to clientelistic dynamics. For higher levels of connectedness, we expect stronger positions of the neighbors towards the local leaders, brokers or politicians. More specifically, the level of social connectedness in the residents’ network impacts positively the power residing in these voters, when facing the traditional trade of political support for either individual or collective benefits. In this line, the following charts describes the dynamics for small poor localities embedded in relational clientelism.

![Allocation of private goods and public investment in small poor localities](image-url)
Interestingly, the level of connectedness shapes the feature of the local leader, who for highly disconnected networks will turn into a rent-seeking broker, with low accountability to the residents. In other words, is a double folded argument: centrality affects the supply side of the market for private and public goods (brokers) while connectedness, the demand side.

Naturally there is an interaction between the effects of centrality and connectedness. For simplicity we evaluate this continuous variables of Connectedness and Centrality as HIGH and LOW levels. The following table depicts the four outcomes resulting from the interaction of these features, leading to distinct scenarios of redistributive politics.

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<td>Accountable leader</td>
<td>Competition - Oligopoly</td>
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<td>Poverty trap</td>
<td>Pre-socialization</td>
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**Accountable leader:** Conditioned on the existence of a strong leader, well connected communities are likely to be more successful in demanding public goods (rather than loose social networks). The expected outcome in high connectedness and high centrality is one where there is one strong leader, who helps the coordination process towards following the same choice. Moreover, communities with higher level of connectedness are more likely to coordinate politically and demand public goods more effectively during campaigns.
**Competition pre-collude:** Absent a clear strong leader, communities with higher levels of connectedness will experience low-to-moderate access to public goods in the short run, because competing brokers will focus their resources on individual transfers. However, the oligopoly of brokers could transform into collusion or at least geographic specialization between them. In the long run, this outcome is not a stable equilibrium, and neighborhoods in this situation may experience moderate-to-high access to public goods.

**Pre-socialization:** Communities with both low levels of connectedness and centrality, in the short run will likely be excluded from clientelism or any process of goods demand, generally happening during electoral campaigns. Nevertheless, we expect to see the emergence of leaders, who in the process or competing with other potential brokers, will foster social capacity. By knocking doors and trying to mobilize voters, the future leaders will progressively increase social connectedness. In the long run, this scenario may transition to ‘Brokerage Competition’, and even eventually to ‘Accountable leader’ eventually.

**Poverty trap:** Conditioned on the existence of a strong leader, neighborhoods with low level of connectedness receive low levels of public goods. This situation is depicted in the classical models of clientelism, where consequences of brokerage monopoly are often detrimental of programmatic promises or public investment. This type of broker is characterized by low level of responsiveness to the community, being mostly rent-seeking.

**Two different types of clientelistic linkages in Udaipur, India**

The following section describes two particular shantytowns in the city of Udaipur, northern India. The results are derived from an original household survey conducted in July 2013 across different poor neighborhoods in Udaipur. The analysis is focused on the following basti:

- **BHEELU RANA KACHCHI BASTI** (*brokerage oligopoly*)

- **SHIVAJI NAGAR KACHCHI BASTI** (*poverty trap*)

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*This section is part of a joint project with Erik Wibbels, ‘Informality, Clientelism, and Elections in Rajasthan’. We thank the ‘Duke University/Indian Institute of Management Udaipur Collaborative effort’ for kindly funding this project.*
These two shantytowns represent different examples of possible outcomes, the first one being more successful than the second one in terms of satisfaction with public goods. Regarding religion, there are not much variation, since in this region of Rajasthan, the vast majority of the population identifies as Hindi. Also both slums have about the same distribution of caste, but their size differ (about 300 households in Bheelu and 160 in Shivaji). However, the history of the settlements is quite different, on average the residents of Shivaji have being living there for 30 years, whereas in Bheelu about 15 years. In this case, time does not play in favor of Shivaji, where only 12% of houses have private bathroom. For Bheelu this number goes up to 35% approximately. Interestingly, in both neighborhoods, residents lack official titles of their houses and land, although overall quality of life seems to be inferior in Shivaji.

When facing the question about public services satisfaction, these two neighborhoods present some notorious differences. In Shivaji, 80% of the residents are dissatisfied with primary and secondary education, whereas in Bheelu, about the same percentage is satisfied with the general quality of infrastructure and public services. For instance, in terms of the conditions of the roads, access to water, and electric services, Bheelu resident’s are significantly less dissatisfied than in Shivaji. Nonetheless, when it comes to waste disposal and public bathrooms the dissatisfaction level reaches almost a 100% in both slums. Broadly, the provision of local public goods is superior in Bheelu than in Shivaji.

The residents also differ over the preference order or priorities for which services need improvements in the locality. While in Bheelu people demand the government to provide health services and public bathrooms, in Shivaji, the top two priorities are sewage and access to water. When they are asked how helpful the slum leader is in order to get the above services, the variation is remarkable. In Shivaji, 60% of the people think their neighborhood leader is not helpful at all in the process of demanding public services. Whereas, in Bheelu, the same percentage considers the slum leader helpful –very helpful (35%) or somewhat helpful (25%). In line with the previous numbers, the average level of satisfaction with the slum leader (in a scale from 0 to 10) is 4.7 in Bheelu and 2.8 in Shivaji. Moreover, 59% of respondents in Bheelu said they contacted their slum leader to solve personal, family, or neighborhood related problems. Of those, a 75% classified his intervention as helpful. In contrast, in Shivaji only 20% of respondents contacted their leader to solve problems and only 47% of them said it was helpful. Clearly, these figures indicate the distinct role played by the slum leader in each neighborhood.

The household survey also shows higher community activities in Bheelu than in Shivaji. Half of those interviewed in the former slum responded they participated in a community meeting in the last 12 months, against a 30% in Shivaji. In both places the dominant topic of discussions in the meetings is about community service needs, but the second most important is quite different. In Shivaji is mostly about solving disagreements among neighbors. In Bheelu, the community meetings spend considerable time discussing the organization of public demonstrations, which is reflected in protest participation levels (55% in Bheelu, against 30% in Shivaji).

According to the survey, these communities present quite dissimilar leadership structure, in particular regarding the level of centrality in their leader(s). In Shivaji, there is one predominant local leader (65% of the resident in that slum mentioned his name), and a secondary one (appointed by 23%). In
Bheelu, power and representation is much more disperse across five main leaders (range of 10% to 25% of mentions). In terms of political parties identification, 90% of the residents in Shivaji identified their main laser with the Congress Party. In contrast, party identification of Bheelu’s leaders is more ambiguous (at least to the respondents). None of the leaders have more than 60% identification with a party, although there is a general predominance of the BJP. The following figures illustrate the distinct shapes of social network.

BHEELU RANA KACHCHI BASTI (five leaders)

- KAMLESH → 23.10 %
- BALWANT → 18.81 %
- MEGHRAJ TAWAD → 14.19 %
- SHANKAR → 11.22 %
- LDHARMI BAI → 9.24 %
SHIVAJI NAGAR KACHCHI BASTI (quasi monopoly)

- KAJAL → 65%
- DHEERU Bhai Vagari → 20.13%

Regardless of the public goods provision or satisfaction on their leader performance, these two communities still present similar clientelistic dynamics. As shown in the following figures, the majority of respondents in both places recognize that the slum leader makes suggestions about which candidate to vote: 65% in Bheelu and 56% in Shivaji. In terms of electoral coordination, both slums provide similar answers when asked if the members of their neighborhood vote for the same party: 46% said in Bheelu and 53% in Shivaji replied ‘yes’. Furthermore, there is a clear association between admitting the leader make suggestions about how to vote and saying that other neighbors vote for the same party.
When it comes to assessing peer pressure, these communities are very similar: about the same percentage said they care about how others neighbors vote (26% in Bheelu and 20% in Shivaji). This is also related to the strength of leaders’ suggestions. More importantly, most respondents said that they frequently or occasionally reach an agreement in community meetings regarding what ballot to cast (71% in Bheelu and 78% in Shivaji). Nevertheless, the motivations for vote choice are considerably different between them. Most residents in Bheelu consider ‘community services’ as the most important priority when choosing how you vote (54%). In contrast, the majority in Shivaji (53%) chose ‘private benefits to family’ as the first priority. The following figure illustrates this interesting and significant divergence in the type of clientelism.
In sum, these neighborhoods provide compelling illustrations of quite contrasting types of clientelistic linkages. On the one hand, SHIVAJI NAGAR KACHCHI BASTI represents an example of poverty trap. The interaction between a strong leader and undeveloped ties as in horizontal political organization, decreases significantly their chances to successfully demand public investment from the relevant political actors. Their main leader is closer to a rent-seeking broker than to an accountable leader. The strong level of dissatisfaction with him describes a detached leader, with low responsiveness to the neighborhood. However, we have seen how people still follow his suggestions in terms of voting choice, and judging by the priorities, residents in Shivaji are rewarded mostly with private handouts, rattan than with public investment in collective benefits.

In contrast, in BHEELU RANA KACHCHI BASTI we found about five leaders who surprisingly share high levels of satisfaction. These leaders are accountable to the slum, they do not seem detached from the local issues, residents consider them accessible to people and above all helpful with access to public services. Bheelu provides an example of brokers who emphasized local public goods (vis a vis private benefits). Not coincidentally, the community is one of the most active in public demonstrations, and mobilized in local assemblies. Social capital is inherent to their socio political organization. According to my criteria, I will classify Bheelu in a transitioning process between brokerage oligopoly and accountable leader. The key factor that rests to analyze is how these five leaders distribute their power geographically. Given this is big neighborhood, I would not be surprised to find that leaders coordinate themselves so that instead of competing with each other, they can specialize in smaller localities inside Bheelu.

Concluding Remarks

This paper aimed to understand why some poor localities are able to significantly improve their quality of life, while others (similarly poor) seem to live in a vicious cycle. I argued that current models of clientelism fail to consider local public goods as a part of politician’s discretionary allocation. Moreover, the literature assumes that there is a dyadic relationship between brokers and voters, without acknowledging that clientelism is embedded in a neighborhood context where social networks greatly influences voting behavior. Taking into account the collective side of clientelism enables us to better understand dynamics of monitoring and electoral coordination.

The analysis of the formal model developed in this paper reveals interesting implications. The level of network connectedness positively affects the vote share for the candidate endorsed by the leader. Social pressure is the main mechanism behind this effect, since voters perceive that whoever the leader promotes, the majority will choose. Besides, higher level of connectedness means lower clientelistic costs (at least under the assumption of broker monopoly).

For the poorest voters, the per capita transfer gets reduced even more because they heavily rely on particularistic benefits for survival (discount factor goes to one). Moreover, localities with high proportion of handout-dependent voters fail to effectively demand public goods. Alternatively, higher resilience to clientelism (discount factor goes to zero) implies higher likelihood of escaping the vicious
cycle. The mechanism behind this adverse effect is that the poorest among the poor cannot credible threat to defect from clientelism, as they need the handouts (e.g. food aid) for survival. In this line, the model contributes with a formal explanation for the so called ‘poverty trap’.

Simultaneously, the leader knows that he will have to spend more resources in clientelism for candidates with worse credibility. The immediate implication is that by constantly dishonoring campaign promises politicians increase their own clientelistic costs. Naturally this is conditioned by the degree of retrospectiveness: when voters are almost entirely prospective, a bad credibility does not increase clientelistic costs. Although, the size of the promise will greatly determines the cost in this last scenario. When voters are prospective to some degree, politicians are able to lower clientelistic costs through heightening their campaign promises (relatively to the other candidate’s). Not surprisingly, clientelism becomes more expensive for larger machines. There is a specific point for which it is more profitable for a politician to rely on the provision of local public goods rather than on clientelism. Surely, public investment commitments escalate with the level of prospectiveness, all else equal. This means that what really increases is not the final provision, but the margin for misrepresenting or inflating the promise (augmenting the lying factor). For cases where voters are prospective to some degree, by increasing the level of public good commitment (relatively to the other candidate’s promise) candidates could lower clientelistic costs.

Furthermore, there is an interesting comparison between the clientelistic model (with a single broker) and the non-clientelistic model. This comparison highlights how the level of connectedness of the social network differently affects local public good provision, conditioned on the existence of a clientelistic structure. In the single-broker scenario, the committed level of public good is indirectly affected by the network characteristic. With higher social connectedness, clientelism is cheaper and leaves more resources in the budget for increasing public good provision. In the alternative setup (no clientelistic structure), the politician’s choice is directly affected by the level of connectedness. Social pressure and network strength do not play in favor of the machine, but in favor of the community. If residents are strong enough to pose a credible threat to the incumbent, politicians will honor their campaign promises. All in all, the intuition of the model reveals that effective electoral coordination in well connected social networks leads to higher levels of public investment. In contrast, slums with weak social ties are associated with individual-level exchanges at the expense of local public goods.

Last but not least, through the description of two slums in an Indian city, we illustrate with real life examples the main argument of the paper. Quite dissimilar patterns of social structure and political organization at the locality level, shape in the cases of Bheelu and Shivaji bastis their success in obtaining better public services. The existence of a strong leader is sometimes necessary for electoral coordination (however not always, as Bheelu shows), but is definitely not a sufficient condition to gain access to local public goods. A powerful broker circumscribed in a low-connectivity community could lead to oppressive clientelism, where a poor neighborhood is lock-in poverty indefinitely.
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Appendix

Challenger - special case?

Throughout the paper, I assumed for simplicity that candidate A, endorsed by the broker was the incumbent in every round (challenger B could never enter). Now, I will proceed to model the case where A is originally the challenger (was not elected in \( t - 1 \)). But A wins in period \( t \) and assumes the role of the incumbent before the elections in period \( t + 1 \).

As a matter of fact, the dynamics do not change substantially. During the second round, the decisions remain the same because A was already incumbent. The first difference happens at the broker’s decision, during the first round. If the broker decides to endorse A, who is the challenger here, the difference in credibility—presumably in favor of the incumbent—has to be compensated with extra resources. Provided the broker supports A, then the per capita benefit will still be the following:

\[
\mathbf{b^* = (1- \delta) \left[ \frac{X_{-50}}{100 \gamma} - \gamma + \rho(\lambda_{Bt} - \lambda_{At}) + (1- \rho)(G_{Bt}^{p} - G_{At}^{p}) \right]}
\]

However now the term \( \lambda_{Bt} - \lambda_{At} \) is different. In the previous section B was the challenger so, his credibility was \(-\phi\), but now that is A’s credibility, so that

\[
\rho(\lambda_{Bt} - \lambda_{At}) = \rho[-(G_{Bt-1} - G_{At}^{p})^2 + \phi]
\]

Assuming for a moment that \( \rho \) is \( \neq 0 \) (i.e. there is some level of retrospective voting behavior), then that term is likely to be positive, because of the assumption that the uncertainty of a challenger is worse than the incumbent’s credibility

\[
\phi > (G_{Bt-1} - G_{At}^{p})^2
\]

Therefore, under this assumption, clientelism is more costly for the challenger because the term

\[
\rho(\lambda_{Bt} - \lambda_{At})
\]

impacts positively on \( b^* \). The relative importance of this extra cost is weighted by the degree to which the voters consider past actions when evaluating current candidates. Naturally, provided voters are almost entirely prospective, then the broker’s cost analysis does not differ from the original set up.

Nonetheless, the unknown credibility of the challenger does not mean that the broker will not support
him. Because of the way this model is set, the broker has the power to establish the cost of \( b^* \) and just translate the extra cost to the politicians. Hence, a challenger can persuade the broker either by spending considerably more resources than the incumbent on clientelism. Or either by taking advantage of a scenario where the incumbent has extremely bad credibility, in which case

\[
\phi \leq (G_{Bt-1} - G_{pBt-1})^2
\]

There is other factor where incumbency advantage affects the payoffs: vote share. The difference in the candidate’s credibility factors in the politician’s utility function (through the vote share). As a challenger, \( A \) might have to spend more resources both in clientelism and in the public good promises. In other words, he has to compensate with economic resources the uncertainty for not having being in office yet. Assuming that the ‘lying factor’ is fixed, the only way to increase the promised level of public good is through increasing the future budget. Whereas the budget is already suffering from the extra costs in clientelism. An immediate implication of this challenger’s problem is that he could choose to maximize his vote share at time \( t \) while sacrificing the utility at \( t+1 \). The challenger could set his promised level too high, so that his \( G_{At}^{p} \) ends being unrealizable. Consequently, \( A \)’s vote share suffer in the next round because of the importance of this term

\[
\lambda_{At+1} = -(G_{At} - G_{At}^{p})^2
\]

in his vote share at the second period. This is particularly the case, when politicians discount the future greatly (\( \alpha \to 0 \)). Of course, this term is weighed by \( \rho \), so that if the level of retrospective evaluation is low enough, the challenger can also overcome his disadvantage by inflating his promise today, without reducing the likelihood of being re-elected tomorrow.