Family Networks and Distributive Politics*

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February 2016

Abstract

We argue that incumbents share rents with central players to build and sustain coalitions. Using an unusually rich dataset, we show that households with high betweenness centrality – a measure of brokerage potential – receive more public services from their local government. This result is robust to the inclusion of controls for program eligibility, family ties with politicians, and other measures of centrality – which are not significant once betweenness is included. We provide further corroboration from indirect evidence from variation in size and electoral competition across municipalities. Finally, we show that in municipalities where politicians provide more goods and services to their relatives they target fewer goods to households with high betweenness centrality. The evidence supports the hypothesis that incumbent municipal politicians offer favorable access to public services to households most able to play a brokerage role in the formation of coalitions of families for electoral support.

*'The authors would like to acknowledge the use of the University of Oxford Advanced Research Computing (ARC) facility in carrying out this work (http://dx.doi.org/10.5281/zenodo.22558). We are indebted to Kate Vyborny for agreeing to act as the third party who performed the random sample split. The Department of Social Welfare and Development kindly allowed us to use data from the National Household Targeting System for Poverty Reduction and Pablo Querubin kindly shared some electoral data. We thank Lorenzo Casaburi, Arun Chandrasekhar, Cesi Cruz, Pascaline Dupas, Clement Imbert and seminar participants at NUS, Oxford and Stanford for comments. All remaining errors are ours.

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1 Introduction

Coalitions are the building blocks of electoral success and political survival. They are especially important when, as common in developing countries, politicians face commitment problems and political parties don't fulfil their function as self-enforcing coordination mechanisms (Acemoglu, Egorov and Sonin, 2008; Humphreys, 2008; Francois, Rainer and Trebbi, 2015). In a dynamic setting, the resulting political equilibrium might involve incumbents sharing rents with key political players to secure their support (Bardhan, forthcoming). We look for evidence that municipal politicians target goods and services towards individuals who, because of their position in the local family network, are most able to bring together disparate groups to form a winning coalition.

We take as a starting point the literature on political interference in electoral democracies. A common theme in this literature is that identifying the beneficiaries of political interference provides useful information about how incumbents attempt to achieve their electoral objectives. While there is ample evidence that politicians interfere with the allocation of services, what is less clear is the direction in which the allocation is distorted. Dixit and Londregan (1996), for instance, propose a model in which incumbents seek to influence the outcome of an election by distributing favors. They derive conditions under which it is optimal for incumbents to target either their core voters or their swing voters. To date, the evidence is often at odds with these theoretical predictions. First, as pointed out by Golden and Min (2013), researchers often have access to aggregated data and have to compare core and swing electoral areas rather than core and swing voters as predicted by the theory. Second, Nichter (2008) makes the point that when voters have the option of abstaining then politicians have incentives to target their strongest supporters to encourage them to go to the polls. Third, Stokes et al. (2013), argue that the model from Dixit and Londregan (1996) and Dixit and Londregan (1998) unrealistically assumes that politicians can easily identify target voters. Stokes et al. (2013) point out that, in practice, finding the right voters to influence is a difficult task for which politicians enlist the assistance of local brokers, middlemen or intermediaries. As a result, politicians target favors disproportionately towards political brokers.

We make two main contributions to the literatures on social networks and on distributive politics. First, we depart from much of the distributive politics literature which, probably for

reasons of data availability, focuses on individual characteristics such as ideology and poverty status (Hicken, 2011; Golden and Min, 2013).[1] We focus instead on the position of individuals in the social network composed of blood ties and marriage ties between families. Second, we do not limit ourselves to direct social ties to politicians (e.g., Fafchamps and Labonne (2014)). Rather we focus on measures of social network characteristics that aggregate information from the entire network. In particular, we compute several centrality measures and take advantage of the large size of our sample to explore the role of networks both in terms of brokerage and of information diffusion. Third, the different data sources that we have combined form an unusually rich set. We have information on eleven different types of public services which cover the majority of services distributed to individual households by Filipino municipal governments. Previous studies tend to focus on only one or two goods and, as pointed out by Kramon and Posner (2013), the responses one gets depend on the good one is analysing. Our centrality measures are calculated on the basis of the full census data. Consequently they do not suffer from the sampling bias identified by Chandrasekhar and Lewis (2011). Finally, by focusing on blood ties and marriage ties we contribute to literature on the economic consequence of the family (Alesina and Giuliano, 2014).

The purpose of this paper is to test whether households that are more central in the municipal network of family ties receive more services from their municipal government. We do this using census data from the Philippines. In order to throw some light on the more precise nature of the political process underlying the distribution of favors by politicians, we investigate which type of centrality matters most: betweenness centrality, degree, Katz centrality, or eigenvector centrality. To minimize possible omitted variable bias, we flexibly control for the social proximity between recipients of favors and elected politicians and for a large number of household characteristics that could affect eligibility for the services studied.

Households with higher betweenness centrality, our measure of intermediation potential, receive more services from their municipal government. The results hold after we include village fixed-effects (residence could affect centrality and the cost of providing the services) as well as detailed measures of household composition and the education and occupation of the household head. We obtain similar results if we focus on either the extensive or the intensive

[1] Cruz (2012) is a notable exception. She shows that politicians target high degree individuals for vote-buying.

margin. Importantly, the effects are not driven by one specific goods but hold across the six public services most commonly distributed by municipal governments in our sample (out of eleven for which we have data).

We can rule out a number of alternative explanations for our findings. First, we show that the point estimate on betweenness is stable when we control for other centrality measures such as degree, eigenvector and Katz centrality. Although those measures are significant when included on their own, point estimates become much smaller and lose their statistical significance as soon as we control for betweenness centrality. Second, the results are robust to controlling for distance between the household and both officials elected in 2007 and to unsuccessful candidates in the same elections. This reduces concerns that our results are merely capturing the fact that local politicians in the Philippines are more central in the family network (Cruz, Labonne and Querubin, 2014) and that politicians are targeting goods to their relatives (Fafchamps and Labonne, 2014). Third, we use the fact that one of the public services is mandated for the poorest 25 percent of households in each municipality to test whether incumbents have better information about the program eligibility of high betweenness centrality households. We find no evidence that this is the case.

We also present evidence of individual- and municipal-level heterogeneity that is consistent with a coalition-building view of political brokerage. First, the correlation between public services and betweenness centrality is weaker for the relatives of both the incumbent and the (unelected) runner-up. This makes sense. Relatives of the incumbent have the same kind of family ties as the incumbent himself or herself, and thus do not really allow the incumbent politician to reach out to a larger audience. In contrast, relatives of the runner-up would probably be reluctant to broker deal for the incumbent, so there is little point trying to buy their intermediation services with public favors. Second, the effects of betweenness centrality are stronger in more electorally competitive municipalities and in more populous municipalities. These two types of municipalities are also those where we expect the incumbent to be more reliant on coalitions. Indeed, in municipalities in which the incumbent is assured to be reelected, there is no need to build a coalition; and forming coalitions in large municipalities involves more challenging social bridging efforts that can be helped by coalition brokers.

Additional evidence on the relationship between *machine politics* and *nepotism* is consis-

tent with our coalition-building argument. We take advantage of the wealth of data available and run a series of municipality-specific regressions to obtain measures of the strength of each strategy in each municipality. We uncover a negative correlation between the degree to which incumbents target their relatives – our proxy for *nepotism* – and the degree to which they target central households – our proxy for *machine politics*. That is in municipalities where politicians provide more goods and services to their relatives they target fewer goods to households with high betweenness centrality. We interpret those results as suggesting that targeting based on betweenness centrality is stronger in municipalities where incumbents need to reach outside of his family circle. This is consistent with the argument that incumbents share rents with key political players when they are not powerful enough to win elections on their own (Bardhan, forthcoming).

Our results highlight that households with high between centrality are potentially valuable to local politicians but we are unable to ascribe intent to the politician or to the recipient of favours. Indeed, incumbents might be the ones identifying and approaching central individuals. Or, conversely, central voters might realise that they have something of value to the politician and attempt to extract rents from them. Our data does not allow us to distinguish between the two. It is also important to keep in mind that our main argument isn't that betweenness centrality has a causal impact on receipt of the goods/services from the local government but rather than the observed partial correlations between betweenness centrality and number of services received are indicative of what politicians have in mind when they decide who to target.

We follow Fafchamps and Labonne (2014) and implement a split sample approach that allows us to address concerns about specification search and publication bias. The method relies on a third party who randomly generated two halves of our dataset. At the moment we only have access to the first half which we use to narrow down the list of hypotheses along with the exact methodology we will use to test them. Once the review process is completed, we will run those tests only on the second half of the data. The final version of the paper will include the associated results. Fafchamps and Labonne (2016) argue that the method reduces the Type I errors.

The remainder of the paper is organized as follows: Section 2 introduces the conceptual

framework; Section 3 presents the context and the data; Section 4 discusses the results and Section 5 concludes.

2 Conceptual Framework

The purpose of this section is to illustrate how centrality relates to the coalition formation role that social networks may play in local elections. Coalition formation yields betweenness centrality as the relevant focus of politician targeting.

2.1 Political Brokerage

In this subsection we assume that the politician's objective is to mobilize a coalition of voting blocks in order to be elected.[2] In the context of our study, it is reasonable to assume that family groupings can be mobilized as voting blocks (e.g., Fafchamps, Vaz and Vicente (2015), Hollnsteiner (1963) and Vaz (2012)). The challenge for the politician is then to mobilize a sufficiently large number of family groupings behind his banner. To form such a coalition, it may be necessary for the politician to enlist the assistance of coalition brokers (Scott, 1972). The role of such brokers is to keep lines of communication open between different families so as to ensure that possible disputes and disagreements about the politician's actions can swiftly be resolved among the families. In this case, it is optimal for the politician to target favors onto individuals who are best able to keep these lines of communication open so as to resolve disputes and coordinate support for the politician among many families.

This brings to the fore a concept of network centrality, one in which an individual i is central if he or she is located on many (short) paths between other individuals in the network. This definition of centrality is related to other network concepts such as those of bridges and structural holes. A node i is a *bridge* if removing that node would split the component in which i is located into two distinct components. In the context of political brokerage, this implies that if i is a bridge between two connected family sub-networks A and B, the only way that individuals in A can communicate with individuals in B is through i. This concept is related to the notion of structural holes introduced by Burt (1992). A node i is a structural hole if it bridges two large

[2] Bardhan (forthcoming) in his recent review of the literature on state and development highlights the importance of understanding how coalitions are formed.

sub-components.

Even when a node does not bridge two sub-components, it can nonetheless serve an important brokering role if many channels of communication between nodes require i's involvement. In this case, forming a coalition between family groupings may be difficult if i refuses to channel messages and resolve disputes between these groupings. To capture this idea, Freeman (1977) introduced the concept of betweenness centrality to characterize the capacity of different Fiorentine families to broker political coalitions in their struggle for control of Florence in the Renaissance period. To construct this measure, let $P(kj)$ denote the number of shortest paths between k and j and let $P_i(kj)$ denote the number of these paths on which i is. If $P_i(kj)/P(kj)$ is close to 1, i is on almost all paths between k and j. Averaging over all possible pairs of nodes yields the following definition: The betweenness centrality of a node is defined as

$$Ce_i^B \equiv \sum_{k \neq j; i \notin \{k,j\}} \frac{P_i(kj)/P(kj)}{(n-1)(n-2)/2} \tag{1}$$

If politicians target goods in order to mobilize political brokers, we expect individuals with high betweenness centrality to be over-represented among beneficiaries.

2.2 Testing Strategy

To summarize, we have shown that if politicians use favors to mobilize coalition brokers, we expect individuals with high betweenness centrality to be over-represented among beneficiaries. As discussed in more details in Section 4, alternative political processes will lead to different centrality measures. For example, if politicians seek to increase their top-down influence (e.g., propaganda, information) by targeting favors on specific individuals, we expect individuals with high Katz centrality, high degree, or high eigenvalue centrality to be over-represented among beneficiaries of local public goods. Although different measures of centrality often are correlated with each other, correlation is not perfect. In a large sample such as ours, this is sufficient to make identification possible. We discuss those alternative measures in more detail in Section 4 and in the Appendix.

3 Context and Data

In this Section, we provide background information on local politics in the Philippines, describe the data and explain our split sample strategy.

3.1 Local Politics in the Philippines

Philippine municipalities are responsible for the delivery of a number of social services. Those services are mostly financed through yearly block grants from the central government. Philippine municipalities are governed by a mayor, a vice-mayor, and eight municipal councilors. All are elected at-large every three years in first-past-the-post elections.

According to existing evidence, local politics tends to be clientelistic and mayors attempt to use their resources and discretion to prolong their time in office (Capuno, 2012). The primary drivers of resource allocations tend to be political considerations. For example, when the Department of Social Welfare and Development started implementing a large-scale conditional cash transfer program in 2008, it was deemed necessary to establish a centralized targeting system rather than to rely on local officials to identify beneficiaries.

Hollnsteiner (1963) argues that incumbents often use intermediaries to build alliances and get things done. Such alliances are kept alive by reciprocal exchanges rooted in the Filipino concept of *utang na loob*. It corresponds to a debt of gratitude, the repayment (which can take many forms) by one side builds another debt on the other side. Importantly, non-repayment generates *Hiya*, often translated as shame. Those debts operate family-to-family rather than individual-to-individual. According to Kerkvliet (1996), the reliance on intermediaries and political machines increased with population growth. Importantly, rewards provided by the machines are not targeted to voters directly but to key players (Kerkvliet, 1996). The concept of key player most consistent with the available qualitative literature is the idea of political brokerage rather than politician influence, although this is something we will formally test below.

To take one concrete example, in 1997, the government launched a subsidized health insurance program to improve health outcomes of the poor (Philhealth Indigent Program). Selected households receive a PhilHealth card, valid for a year, which entitle them and their dependents

to a range of health services in accredited hospitals and health stations. Premiums contributions are paid by the municipal and the national government. The sharing rule depends on poverty levels and length of program implementation, with poorer localities contributing less and contributions increasing over time. Enrollment decisions rest with local officials. The target population is the 25% poorest households in the municipality. The selection is believed to be influenced by local political considerations and, as a result, to be fraught with both inclusion and exclusion errors. For example, the World Bank estimates that about 40-50 percent of PhilHealth Indigent Program members are classified as non-poor (World Bank, 2010).

3.2 The Data

Our main data source is the National Household Targeting System (NHTS). The data were collected by the Department of Social Welfare and Development (DSWD) to select beneficiaries for a large-scale conditional cash transfer program. The dataset includes information on household composition and, of particular relevance for our paper, on services received by any household member. The specific services on which we have data are: (i) Scholarship; (ii) Day Care Service; (iii) Supplemental Feeding; (iv) Subsidized Rice; (v) PhilHealth (Subsidized health insurance); (vi) Skills/Livelihood Training; (vii) Housing; (viii) Microcredit; (ix) Self-Employment Assistance; (x) Municipal Cash Transfer Program and, (xi) Other.[3] There is also detailed information on the gender, education and occupation of each household member. We also have the predicted per capita income that was used for the Proxy Means Test.

We have data for the 709 municipalities where all households in the municipality were interviewed.[4] We impose two main restrictions on our sample. First, the sample is restricted to municipalities where the data were collected before the May 2010 elections. This is to ensure that all observations in the analysis relate to the same municipal election of May 2007. Second, the first wave of data collection didn't gather information on access to services – a different questionnaire was used. We exclude those municipalities. We are left with more than 3.2 million households in 560 municipalities.

[3]Unfortunately, official budget data are not disaggregated enough for us to estimate the share of the municipal budget allocated to those services.

[4]We also have data for the remaining municipalities but as the data were only collected on a subset of the population we do not use them to ensure that our centrality measures are unbiased (Chandrasekhar and Lewis, 2011).

As discussed in Fafchamps and Labonne (2014), we have access to the non-anonymized version of the dataset and we take advantage of local naming conventions to assess family links between individuals. Names used in the Philippines were imposed by Spanish colonial officials in the mid-19th century. One of the stated objective was to distinguish families at the municipal-level to facilitate census-taking and tax collection (Scott, 1998; Gealogo, 2010). Last names were selected from the *Catalogo alfabetico de apellidos*, a list of Spanish names and thus do not reflect pre-existing family ties. In each municipality a name was only given to one family. As a result, there is a lot of heterogeneity in names used at the local level, reducing concerns that names capture similar ethnic background or other group membership. Names are transmitted across generations according to well-established rules inspired from Spanish naming conventions. Specifically, a man's last name is his father's last name and his middle name is his mother's last name. Similar conventions apply to unmarried women. A married woman has her husband's last name and her middle name is her maiden name, *i.e.*, her father's last name.[5]

In the Philippines the process to change one's middle or last name is long and the probability of success is low. This reduces concerns about strategic name changes. Article 376 of the Civil Code of the Philippines (Republic Act No. 386, 1949) states that *No person can change his name or surname without judicial authority.* This has been upheld in a number of court cases which have sometimes reached the Supreme Court.[6]

We take advantage of the data to compute a number of measures of the position of each individual in the network. A node in our network is an individual and an edge is defined to exist between two nodes if they share either a family name. Recall that in the Philippines individuals have two family names: their middle and last names. Using the igraph and networkx modules in python, we compute four centrality measures (betweenness, degree, eigenvector, and Katz) as well as measures of social distances of each individual to all the candidates in the 2007 elections.[7] Because the data on public services is aggregated at the household level, we

[5]In our sample, 77 percent of household heads are married, eleven percent are widowed, four percent are single and two percent are divorced/separated.

[6]For example, in the case Wang v. Cebu City Civil Registrar (G.R. No. 159966, 30 March 2005, 454 SCRA 155), Justice Tinga indicated that *the Court has had occasion to express the view that the State has an interest in the names borne by individuals and entities for purposes of identification, and that a change of name is a privilege and not a right, so that before a person can be authorized to change his name given him either in his certificate of birth or civil registry, he must show proper or reasonable cause, or any compelling reason which may justify such change. Otherwise, the request should be denied.*

[7]Unfortunately, the data do not include information on first name and so we are unable to identify the candidates

aggregate our centrality and social distance measures as follows. For the centrality measures, we take the highest among all household members. For the distance measures, we take the smallest among all household members. Descriptive statistics are available in Table 1 and the correlations between the various centrality measures are in Table 2. The average household is distance 2.5 to a municipal councilor and distance 4 to the mayor and the vice-mayor. While the numerical values of the centrality measures are difficult to interpret, it is important to note that, as expected, they exhibit large right skew. For example, the standard deviation of betweenness centrality is twice its mean. In addition, the measures are positively correlated but the correlations are far from perfect; making identification possible.

Our main variable of interest is the number of services households receive from the municipal government. As pointed out by Kramon and Posner (2013), politicians might use different targeting strategies for different goods and services. Focusing on the full set of services ensures that our conclusions provide a more comprehensive test of politicians' behavior. On average households receive 0.77 services from the municipal government. About 49 percent of households do not receive any and, conditional on receiving at least one, households receive 1.6 services on average. Descriptive statistics are available in Table 1.

3.3 A Split Sample Approach

We followed Fafchamps and Labonne (2014) and asked a third party to randomly split our data in two halves. Importantly, the sample split was carried out *after* we computed the various network measure so they do not suffer from the biases identified by Chandrasekhar and Lewis (2011).

As indicated in the introduction, this approach allows us to deal with concerns about specification search and publication bias. The first half (*training set*) is used to narrow down the list of hypotheses we want to test. Once the list is finalized, they will be applied to the second half (*testing set*) to which we do not have access yet. These are the results that will be reported in the published version of this paper. The purpose is to provide credible estimates free of specification search and publication bias and to deliver adequately sized statistical tests. By allowing us to learn from the first sample, our approach reduces concerns that pre-analysis plans

individually. We compute the minimum distance to an individual sharing the candidate middle or last name.

might 'stifle innovation' (Casey, Glennerster and Miguel, 2012; Deaton, 2012). It is related to the strategy advocated by Humphreys, Sanchez de la Sierra and van der Windt (2013).[8]

We want to emphasize three important features of the proposed method. First, the method would be valuable even if we had strong priors regarding the most appropriate way to estimate the parameters of interest. Indeed, in such cases, researchers still have to make a number of micro-decisions regarding the precise way to, among others, define the list of control variables and the list of heterogeneous treatment effects to carry out. The method ensures that researchers do not, consciously or unconsciously, focus on regressions where the null hypothesis is rejected. Second, the information available to the referees and editor at the time of submission is similar to the information contained in regular submissions. Third, the method reduces the risk of publication bias as editors decide whether to publish a paper before seeing the final results.

The exact procedure followed is as follows. After having put the data together, we wrote a program to split the sample into two randomly generated halves. For a number of variables, intra-cluster correlations within households and villages is relatively high. Hence, to minimize the chance that the two halves may be too correlated, we sample villages, rather than individuals or households. We sent the program along with the dataset to a third party who generated the two random samples. She sent us the first sample and kept the second one. Importantly, the program used to generate the samples generates new provincial, municipal, village, household, and individual IDs. As a result, at no point are we able to reconstruct the second sample from the data we have access to.

4 Empirical Results

4.1 Betweenness Centrality and the Receipt of Public Services

We start by testing whether households with high betweenness centrality receive more public services. We estimate equations of the form:

[8]These authors argue that researchers carrying out RCTs should write mock reports with fake data before the real data become available in order to distinguish between exploratory analyses and genuine tests Humphreys, Sanchez de la Sierra and van der Windt (2013). The main advantage of our approach is that, since we are using real data, we are able to incorporate results from exploratory analyses in our analysis plans.

$$Y_{ivm} = \alpha C_{ivm} + \beta X_{ivm} + \rho_{vm} + \epsilon_{ivm} \quad (2)$$

where α is the parameter of interest, Y_{ivm} is the number of services the household i receives from the municipal government in village v in municipality m, C_{ivm} is the betweenness centrality of household i in municipality m, and X_{ivm} is a vector of observable household characteristics used as controls. We use a saturated model, which means that we include a full set of dummies for each distinct value of each control variable included in vector X.[9] ρ_{vm} is an unobservable affecting all households in village v and ϵ_{ivm} is an idiosyncratic error term. Standard errors account for potential correlation within municipalities. More specifically, standard errors are clustered at the municipal-level. To facilitate interpretation, our main measure of betweenness centrality is the percentile rank in the municipality. As discussed below, our results are robust to using alternative measures (Table A.1).

We start by estimating equation (2) without any controls. We find that high betweenness households receive more public services (Column 1 of Table 3). The results are similar if we include municipal fixed effects (Column 2) and village fixed effects (Column 3). Village fixed effects control for one potentially important confound, namely, that more central households reside in villages that are more centrally located within the municipality and that the cost of providing services is lower there.

One might be concerned that betweenness centrality is correlated with household characteristics that are themselves correlated with the likelihood that a given household receives services from the government.[10] To investigate whether this can account for our results, we add as controls measures of household composition and household wealth (Column 4).[11] The point estimates are smaller but remain statistically significant. Another concern is that our results might be driven by characteristics of the household head, such as education. To account for this possibility, we further add as control a number of characteristics of the household head.

[9] In situations where measurement error is an issue, controlling for the full set of dummies might lead to more biased estimates. To deal with those concerns, we will reproduce our main results controlling for the control variables linearly (Table A.4).

[10] Only one of the services on which we have data has official eligibility criteria. We explore that service in more details in Section 4.4.

[11] The exact list is as follows: number of girls below one, between one and 5 and between 6 and 14; number of boys below one, between one and 5 and between 6 and 14; number of women between 15 and 29, between 30 and 49 and above 50; number of men between 15 and 29, between 30 and 49 and above 50. We also include a dummy for whether the household is classified as poor and the household predicted per capita income.

We find that our estimates remain basically unchanged (Column 5).[12] Results also remain unaffected when we further control for the household's head occupation (Column 6).[13]

For completeness, we also replicate our analysis for each service separately (Table A.5). Panel A provides results with village fixed-effects but without any additional controls and Panel B provides results with the full set of controls. For the six most common services, households with a higher betweenness measure are more likely to receive them. The services for which centrality is not significant are less common, with fewer than 1.8 percent of households receiving them. Up to now we have included the category 'Other' as one possible service that citizens receive from their municipal government. That category might include more than one service and we check that our findings are robust to excluding that category from our dependent variables. Results are basically unchanged when we do so (Table A.2).

To better understand the pattern of association between centrality and public services, we further test whether betweenness centrality operates through the intensive or the extensive margin. In Panel B, we run the same set of regressions but restrict the sample to households that receive at least one service. In Panel C, the dependent variable is a dummy equal to one if the household received at least one service. We think of Panel B as capturing some form of intensive margin[14] and Panel C as capturing the extensive margin. We find that betweenness centrality is associated with more public services along both the intensive and the extensive margin.

Before turning to alternative interpretations, we check the robustness of our results to the way betweenness centrality enters the regressions. So far we have been using the percentile rank of the betweenness centrality of individual i in municipality m. In Panel A of Table A.1, we show that our results are robust to using various alternative measures. In Column 1 we use the non-normalized betweenness from formula (1) while in Column 3 we use the percentile rank of individual i's betweenness in village v. In Column 4 betweenness is standardized to have mean and variance one. We also normalize the betweenness measure to have mean zero and variance

[12] The exact list of control variables is as follows: education attainment, gender, marital status, age and number of years the individual has lived in his village of current residence.

[13] We also perform a placebo exercise where we randomly reallocate the betweenness measure across households within the same municipality. We perform 10,000 iterations of this exercise. In Figure A.1 we plot the distribution (density) of point estimates of α from estimating regression 2 in the *placebo* dataset generated in each iteration. The distribution of the placebo estimates is centered around zero. Moreover, none of the placebo estimates from the 10,000 iterations comes close to the actual estimate obtained with the original sample.

[14] We are unable to put a dollar value on the services they receive.

one in each municipality (Column 5) or in each village (Column 6). In Panel B we follow the same process but use the mean betweenness for all household members instead of the maximum betweenness among all members of the household. This leaves us with 12 different regressions. In all cases we reject the null at the five percent level or less. Our results therefore do not depend on the specific way by which we constructed the betweenness regressor.

4.2 Is Betweenness Centrality Proxying for Distance to Politicians?

So far we have shown that households with high betweenness centrality receive more services from the municipal government. This is consistent with models of coalition formation and political brokerage discussed in Section 2. It suggests that incumbents attempt to build coalitions by providing goods and services to key nodes in the networks. We now seek to rule out a number of alternative interpretations for our findings.

A potential concern with our results is that, as argued by Cruz, Labonne and Querubin (2014), local politicians are more central and so we might be capturing the fact that politicians are targeting their relatives. As discussed in Section 3, we compute a number of distance measures to elected officials (capped at 5) and, in Panel A of Table 4 we show that our results are robust to controlling for the distance between household i and various politicians. In Column 1, we control for distance to the mayor. Consistent with findings by Cruz, Labonne and Querubin (2014) and Fafchamps and Labonne (2014), the point estimate of the betweenness variable is smaller but we can still confidently reject the null of zero coefficient. In Columns 2 and 3 we control either for the distance to the vice-mayor (Column 2) or to municipal councilors (Column 3). In Column 4 we include all three distances jointly. In all cases, we include a full set of dummies for each value of the distance variables. The results are robust to controlling for distance to elected officials. We therefore conclude that our findings are not merely due to the fact that incumbents are targeting their relatives. In the remaining regressions we report here, we always control for distance to the mayor, vice-mayor, and municipal councilors.

A related concern is that, by virtue of being associated with a candidate in the opposition, relatives of losing candidates may be less likely to receive services from the municipal government (Fafchamps and Labonne, 2014). If this is the case, our estimates would be downward biased. In Panel B of Table 4 we take advantage of the measures of distances to all candidates

in the 2007 elections and show that our results are robust to controlling for distance to losing candidates in the 2007 elections. This is implemented as follows. In Column 1 we include distance to the runner-up in the mayoral race. In Column 2 we do the same for the vice-mayoral electoral race and, in Column 3, for unsuccessful candidates to the post of councillor. Finally, we jointly control for distance to the three types of losing candidates (Column 4). Our results are similar to those reported previously.

4.3 Is Betweenness Centrality Proxying for Other Centrality Measures?

Next we investigate whether politicians channel favors to individuals who have a different kind of centrality. The purpose of this investigation is to verify whether the conditional association between betweenness centrality and public services is due to a process other than coalition formation. If this were true, betweenness centrality might merely be proxying for influence-based measures

Indeed, it is possible that brokers relay, in a top-down manner, a message from politicians to voters. A related possibility is that they influence people to cast their vote in a certain way. In either of these cases, we expect brokers to be individuals who are close enough to politicians to be trusted, but who can reach the maximum number of people through their network of influence. If we translate this concept in terms of network structure, a broker should be someone who can spread influence to the largest possible number of voters. If influence must be one-on-one, the most influential brokers are those with many social links, that is, with high degree. If influence percolates through the social network and is amplified by a social feedback multiplier – e.g., 'buzz' or 'trending' effects – then an influential broker is someone with a high Katz or eigenvalue centrality (Jackson, 2010).[15]

To test this possibility, we re-estimate equation (2) with other measures of centrality included as additional regressors. As before, for each measure we use the percentile rank of household i in municipality m. We start with Katz centrality (Columns 1-2 of Table 5). On its own it is positive and significant but, as soon as we control for betweenness centrality, it is no longer significant and the point estimate drops from .013 to -.005. The point estimate on betweenness centrality is similar to what we reported earlier, however. We obtain similar results

[15] We provide a definition of these concepts in Section A.1.

if we use degree (Columns 3-4) or eigenvector centrality (Columns 5-6). As shown in Table A.6 we obtain similar results if instead of using the percentile rank we normalise each centrality measure to have mean zero and variance one in each municipality (Panel A) or if we use the mean betweenness of all household members (Panels B and C). Overall, this set of results suggests that incumbents are providing services to their constituents not in order to channel influence over the social network, but rather in elicit their help in bridging different families around a winning electoral coalition.

4.4 Ruling out Confounds and Robustness Checks

A possible information-based explanation for our findings is that incumbents have better information about high betweenness households than about the rest of the population.[16] As a result, they might be better able to identify among them the households that are eligible for the relevant programs. Under such a scenario, the effects of betweenness should be greatest for eligible households (or for almost-eligible households). While in light of our results on Katz and eigenvector centrality, we don't think this interpretation is very likely we nonetheless test this idea and estimate the following equation (where E_{im} is the measure of eligibility):

$$Y_{ivm} = \alpha C_{ivm} + \beta E_{ivm} + \gamma E_{ivm} * C_{ivm} + \psi X_{ivm} + \rho_{vm} + \epsilon_{ivm} \tag{3}$$

We focus on the subsidized health insurance program (Philhealth) because, for this particular public service, we know the official targeting rule. Recall that at the time the data were collected, Philhealth was mandated to reach the 25 % poorest households in each municipality. Taking our predicted per capita income measure as the relevant measure of poverty in the municipality, we find that on average 25 percent of eligible individuals receive the program while 28 percent of non-eligible households receive it. It is important to acknowledge that we have predicted per capita income rather than actual per capita income which could explain some of the mis-targeting observed in the data. However, there is no a priori reason to believe that this potential source of bias is correlated with betweenness.

We are unable to reject the null that γ is different from zero when we define E_{im} as being

[16] This would be related to recent findings from Indonesia on targeting and social networks by Alatas et al. (2013) and Alatas et al. (forthcoming).

below the 25th percentile in the municipal distribution of per capita income. This suggests that our findings are unlikely to be driven by incumbents having better information about more central households (Column 1 of Table 6). Identical result are obtained if we define eligible households as being below the 30th (or 35th) percentile in the municipal distribution of per capita income. Again the interaction terms are not significant (Columns 2-3 of Table 6).

We also investigate whether the likelihood of receiving Philhealth conditional on betweenness may be larger in a small interval around the eligibility cutoff because incumbents are unable to distinguish between households there. To this effect we estimate equation (3) where E_{im} is defined as being in the 22.5-27.5th percentile, the 20-30th percentile or the 17.5-32.5th percentile in the municipal distribution of per capita income. Again, the interaction terms are not significant (Columns 4-6 of Table 6).

A final concern is that incumbents might perceive poverty differently and thus might not consider per capita income to be an adequate measure of poverty. One source of variation could arise if politicians do not use per capita income but rather income per adult-equivalent to assess poverty. This would be a reasonable approach if there are economies of scale in household self-provision and the needs of household members vary systematically with age. To account for this possibility we reproduce the results with different equivalence scales. Again we find no evidence that incumbents are targeting eligible households among their relatives (Tables A.7 and A.8).[17]

In Table 7 we show that our results are robust to alternative samples and additional controls. First, we focus on the sample of municipalities outside of the Autonomous Region of Muslim Mindanao (ARMM). The likelihood that two individuals sharing the same names are related is lower in the ARMM. In addition, conflict is more prevalent there and this might have affected data quality. The results are robust to this change (Column 1).

Second, to address concerns that our results may be driven by outliers, we reestimate our regression model excluding the bottom and top 10 percent of households in the betweenness distribution in each municipality. Again, results are robust to this change (Column 2). They are also robust to excluding the bottom and top 10 percent of households in the betweenness

[17] In Table A.7 the number of adult equivalent is $(n_a + 0.92n_c)^{0.85}$ and int Table A.8 it is $1 + 0.7(n_a - 1) + 0.5n_c$. (where n_a is the number of adult members older than 15 and n_c is the number of household members younger than 14).

distribution in each village (Column 3).

Third, we exclude the top and bottom 10 percent of municipalities in terms of population, on the off chance that they might affect the quality of the name matching algorithm. Estimated coefficients are robust to this change as well (Column 4).

Fourth, we further control for a number of observable household assets and characteristics.[18] The results are unaffected (Column 5). Fifth, some might be worried that pure name effects may explain some of our results. To investigate this possibility, we control for measures of name origin and name complexity. Again, results are robust to this change (Column 6).

One additional concern is that, despite our extensive use of control variables, a particular type of individuals are able to affect both their centrality in the network and to lobby the local government to access goods and services. We argue that this is unlikely to drive our results. First, it is difficult for an individual to affect their betweenness centrality as it is a function of overall network structure. Second, if that was the case we would expect to find similar results with the other measures of centrality. Third, to reduce those concerns, we exclude from the sample all individuals that are distance of one of any politician who ran in either the 2007 or the 2010 elections. We estimate equation (2) on that sample. Results, available on Table A.3, are basically unchanged.

4.5 Further Corroboration

We have documented a strong correlation between the public services households receive and their betweenness centrality in the local family network. We have shown that this correlation remains if we control for social distance to politicians and for other measures of centrality, and is robust to other confounds. We have interpreted the correlation between public services and betweenness as consistent with the idea that incumbent politicians direct favors toward individuals who are in a position to support their coalition building efforts. We now provide additional indirect evidence consistent with this argument.

We start by exploring individual-level heterogeneity and show that the correlation between public services and betweenness is weaker for close relatives of either the incumbent or the runner-up. We then explore municipal-level heterogeneity, highlighting that the coefficient of

[18] Materials roof, materials wall, house type, tenure, access to electricity, type of water supply and assets (television video stereo fridge washing machine, A/C, car, phone, and microwave).

betweenness centrality is greater in municipalities where one would expect incumbents to be more reliant on coalitions in order to win elections.

We start by testing whether the coefficient of betweenness centrality is a function of distance to the incumbents. We expect betweenness centrality to matter less for households that are very close to the incumbent because, by the nature of the family network, their own family ties largely overlap with those of the incumbent. Consequently close relatives bring little additional coalition formation capacity beyond what the incumbent can achieve on his or her own. On the other hand, unrelated individuals may be less easily trusted. For these reasons, we expect the coefficient of betweenness to be largest for individuals at intermediate social distance from the incumbents, i.e., distance 3 or 4 in our social network. At this intermediate social distance, brokers can easily be used to introduce the politician to various individuals in the local community (Hollnsteiner, 1963). Importantly, in our networks, there is significant variation in betweenness at each level of distance to the incumbent.[19]

To test this idea, we estimate equation (2) with a separate betweenness measure for each value of the distance to the incumbent mayor elected in 2007. Results, available in Panel A of Table 8, are consistent with expectations. This provides further evidence that our findings are driven by incumbents' desire to enlist the help of high betweenness individuals in order to establish and maintain political coalitions among local families.

Next we examine whether the coefficient of betweenness centrality is weaker for the close relatives of the runner-up. We expect that, on average, close relatives of politicians in the opposition are unlikely to be willing to serve the political ambitions of incumbents. Hence it would make little sense for incumbents to target their favors on them in the hope that they would cement a political coalition in their favor – if only because they may be trying to form an opposing coalition. It follows that the coefficient of betweenness should be smaller for individuals closely related to a losing candidate.

To investigate this idea, we interact betweenness with a dummy equal to one if the the household is at social distance one or two from unsuccessful candidates in the 2007 mayoral election, and we re-estimate equation (2). Results are presented in Panel B of Table 8. As

[19]The standard deviation of our betweenness measure is .26 for households that are distance one to the incumbent, .26 for households that are distance two to the incumbent, .28 for households that are distance three to the incumbent, .27 for households that are distance four to the incumbent and .29 for households that are distance five or more to the incumbent.

anticipated, the interaction term is negative and significant.

Third, we compare the coefficient of betweenness across municipalities with different degrees of electoral competition. When competition between politicians is fierce, building a supporting coalition is more critical for success, and thus we expect incumbents to invest more into enlisting the support of individuals who can serve as coalition brokers. In contrast, in municipalities where the incumbent's victory is virtually guaranteed, it is less necessary to devote resources to coalition brokers. Incumbents may instead engage more in redistributing public resources towards their close relatives. Based on this, we expect the coefficient of betweenness to be smaller in less competitive municipalities.

To test these ideas, we estimate equation (2) interacting betweenness with the vote margin of the incumbent in the 2007 election. The maintained assumption behind this testing strategy is that the vote margin in 2007 has predictive power for expected vote margin[20] in the 2010 election which, to recall, takes place after the public service data used here was collected. The results, presented in Table 9, are consistent with these predictions. The magnitude of the interaction term is relatively large. A one standard deviation increase in vote margin is associated with a 34 percent decline in the coefficient of betweenness centrality. Similar results are obtained if we use vote share instead of vote margin as a measure of electoral competitiveness (Table A.9).

A fourth indirect way of cross-checking the interpretation of our findings involves looking at the size of the municipal electorate. In small municipalities, it is probably relatively straightforward for politicians to build a winning coalition. The need to enlist the help of coalition brokers and political machines is probably higher in municipalities with a larger electorate (Kerkvliet, 1996). To verify whether this is the case, we estimate equation (2) interacting betweenness with municipal population (normalised to be mean zero and variance one). The results, presented in Table 9, are in line with our conjecture. A one standard deviation increase in population is associated with a 30 percent increase in the coefficient of betweenness centrality.

We provide additional evidence consistent with our coalition-building argument. We explore the relationship between targeting based on betweenness centrality and to elected offi-

[20] Which we normalise to have mean zero and unitary variance.

cials' relatives. Indeed, a powerful incumbent might be able to target goods and services to her relatives and not have to build coalitions by targeting central households. To test for that we take advantage of our available data and estimate M equations of the form:

$$Y_{iv} = \alpha_m C_{iv} + \beta_m D_{iv} + \gamma_m X_{iv} + \epsilon_{iv} \tag{4}$$

where α_m and β_m are the parameters of interest, Y_{iv} is the number of services the household i receives from the municipal government in village v , C_{iv} is betweenness centrality of household i in the municipality, D_{iv} is the distance (in the network of family relationships) between household i and elected officials, X_{iv} is a vector of observable household characteristics, and ϵ_{iv} is an idiosyncratic error term. In each case the sample is restricted to households residing in municipality m.

One can think of $\hat{\alpha}_m$ as a municipal-level measure of *machine politics* and of $\hat{\beta}_m$ as a municipal-level measure of *nepotism*. For each municipality m we have information on $(\hat{\alpha}_m, \hat{\beta}_m)$ along with a number of municipal characteristics Z_m. To facilitate interpretation, we multiple $\hat{\beta}_m$ by -1 so that an increase in $\hat{\beta}_m$ can be interpreted as increase in the strength of nepotism. We also normalize the coefficients to be mean zero and standard deviation one. We then regress $\hat{\alpha}_m$ on $\hat{\beta}_m$ and Z_m: [21]

$$\hat{\alpha}_m = a\hat{\beta}_m + bZ_m + u_m \tag{5}$$

There is a negative correlation between the extent to which incumbents target goods and services to their relatives and to households based on their betweenness centrality (Table 10). The correlation is robust to controlling for a number of municipal-level characteristics: incumbent margin of victory in 2007, population, poverty incident, inequality and per capita fiscal transfers from the central government.[22] To the best of our knowledge we provide the first estimates that various strategies are substitutes.[23]

[21] We weight each observations by the number of households that are used to estimate $\hat{\beta}_m$. We obtain stronger results if we estimate unweighted equations instead (Table A.10). This suggests that the tradeoffs is stronger in smaller municipalities.

[22] Importantly, and consistent with the previous results, $\hat{\alpha}_m$ is larger in more populous municipalities and in more electorally competitive municipalities.

[23] This is related to findings by Cruz (2014) who show that politicians with different characteristics use different electoral strategies (pork barrel vs. individually targeted policies). We extend this line of inquiry by allowing the relationship between the various strategies not to be driven by observable characteristics.

To summarize, all five indirect tests that we have run corroborate our interpretation of the data, namely that, when needed, incumbent politicians target public services towards individuals who, thanks to their family ties, are in a good position to serve as coalition brokers.

5 Conclusion

We investigated whether local public services go more than proportionately to households that are better able to play a brokerage role in the formation of coalitions of families for electoral support. We argue that if the objective of local politicians is to build a large coalition of families then incumbent politicians should target favors towards household that have high betweenness centrality in the municipal network of family ties.

We use an unusually rich dataset on family networks and the distribution of public services at the local level to test these ideas. We find that individuals with high betweenness centrality receive more local public services than others. This result arise both at the extensive and intensive margins. It is robust to the inclusion of many control variables, including household characteristics predictive of eligibility to government programs, and the distance between each individual and different categories of incumbent politicians at the municipality level. We do find that other measures of network centrality are unconditionally correlated with being a recipient of multiple public services. But this correlation disappears once we control for betweenness. To provide further corroboration, we look for other indirect evidence that our interpretation of the results is correct. We find that the coefficient of betweenness is larger in municipalities that are large or more competitive, and smaller in municipalities in which the incumbent has a high probability of winning the next election. We also find that close relatives of opposition politicians with high betweenness do not receive more public services. We argue that, taken as a whole, the evidence strongly supports the hypothesis that incumbent municipal politicians offer favorable access to local public services to individuals and household most able to play a brokerage role in the formation of coalitions of families for electoral support.

Since we are relying on observation data, we use a split sample approach as protection against false rejection of the null hypothesis and publication selection bias. Fafchamps and Labonne (2016) demonstrate the effectiveness of the approach in avoiding false positive, i.e.,

Type I error. The results presented here are based on the training sample. The final, published version of the paper will contain the results from the testing sample. Hopefully they will confirm the results presented here. If they do not, we will have avoided drawing spurious inference.

The reader may wonder about the external validity of our findings: what do we learn from our results that would apply elsewhere? The first observation to make is that we study municipal elections. Because of the logistical difficulty of forming a large-scale winning coalition of families, gathering voter support in elections at the regional or national level is likely to employ different mobilization techniques, such as the use of civic organizations (e.g., unions, churches, parties) as well as reliance on marketing and the media. Secondly, we study a country at a moment in time when elections are contested and there isn't a single dominant party. As some of our results suggest, we do not anticipate a similar emphasis on coalition brokers in countries with a single or dominant party. Third, unlike other parts of the world, the study country has largely escaped identity politics. Political parties in the Philippines tend to be political machines with little or no ideological foundation. In fact, it is common for politicians to switch allegiance from one party to another from one election to the next. Mobilizing voters through identity politics may be cheaper, from the politicians' point of view, than seeking support through coalitions of local families. By the same reasoning, democracies where political parties are less clientelistic and compete in programmatic terms may have less need for the coalitions documented here. We therefore expect our findings to generally apply to electoral democracies with sufficient competition between clientelistic politicians at the local level - as commonly found in many countries across the world.

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Table 1: Descriptive Statistics

	Mean	Std. Dev	Min	Max
Services				
# received	0.77	1.01	0.00	11.00
Receives at least one	0.49	0.50	0.00	1.00
# received conditional on receiving at least one	1.57	0.90	1.00	11.00
*Centrality Measures (*1,000)*				
Between	0.21	0.42	0.00	105.87
Degree	9.82	17.39	0.01	399.73
Eigenvector	2.25	8.26	0.00	180.75
Katz	6.82	3.34	2.28	94.31
Distance Measures				
Mayor	4.00	1.14	1.00	5.00
Vice-Mayor	4.01	1.15	1.00	5.00
Councilor	2.53	0.87	1.00	5.00

Table 2: Correlation Between the Centrality Measures

	Between	Degree	Eigenvector	Katz
Panel A: Raw measures				
Between	1.00			
Degree	0.25	1.00		
Eigenvector	0.26	0.49	1.00	
Katz	0.52	0.66	0.63	1.00
Panel B: Percentile ranks (municipal-levels)				
Between	1.00			
Degree	0.66	1.00		
Eigenvector	0.54	0.85	1.00	
Katz	0.65	0.99	0.86	1.00

Table 3: Betweenness and Receipt of Government Services

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: # Services received						
Between	0.112***	0.111***	0.103***	0.057***	0.039***	0.039***
	(0.006)	(0.005)	(0.004)	(0.003)	(0.003)	(0.003)
Fixed effects	None	Municipal	Village	Village	Village	Village
Observations	1,657,146	1,657,146	1,657,146	1,657,146	1,657,146	1,657,146
R-squared	0.001	0.235	0.307	0.348	0.356	0.357
Panel B: # Services received | receiving at least one service						
Between n	0.066***	0.079***	0.074***	0.040***	0.027***	0.027***
	(0.006)	(0.005)	(0.004)	(0.004)	(0.003)	(0.003)
Fixed effects	None	Municipal	Village	Village	Village	Village
Observations	813,383	813,383	813,383	813,383	813,383	813,383
R-squared	0.000	0.141	0.215	0.253	0.258	0.258
Panel C: Receiving at least one service						
Between	0.051***	0.049***	0.046***	0.028***	0.019***	0.019***
	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Fixed effects	None	Municipal	Village	Village	Village	Village
Observations	1,657,146	1,657,146	1,657,146	1,657,146	1,657,146	1,657,146
R-squared	0.001	0.243	0.303	0.329	0.337	0.338

Notes: Results from household-level regressions. The dependent variable is the number of services the household receives from the municipal government (Panels A and B) and a dummy capturing whether the household receives at least one service (Panel C). Regressions include municipal fixed effects (Column 2) and village fixed effects (Column 3-6). In Columns 4-6, regressions control for the number of men age 15-29, 30-49 and 50+, the number of women age 15-29, 30-49 and 50+, the number of boys age less than 1, 1-5 and 6-14., the number of girls age less than 1, 1-5 and 6-14, whether the household is classified as poor and the household predicted per capita income. Regressions control for the household's head gender, marital status, age, education and length of stay in the village of current residence (Column 5-6). Regressions control for the household's head occupation (Column 6). The standard errors (in parentheses) account for potential correlation within municipality. * denotes significance at the 10%, ** at the 5% and, *** at the 1% level.

Table 4: Controlling for Distance to Politicians

	Mayor	Vice-Mayor	Councilor	All
	(1)	(2)	(3)	(4)
Panel A: Controlling for distance to Winning Candidates				
Between	0.033***	0.033***	0.029***	0.026***
	(0.003)	(0.003)	(0.003)	(0.003)
Observations	1,657,146	1,657,146	1,657,146	1,657,146
R-squared	0.357	0.357	0.357	0.358
Panel B: Controlling for Distance to Losing Candidates				
Between	0.025***	0.026***	0.025***	0.024***
	(0.003)	(0.003)	(0.003)	(0.003)
Observations	1,657,146	1,657,146	1,657,146	1,657,146
R-squared	0.358	0.358	0.358	0.358

Notes: Results from household-level regressions. The dependent variable is the number of services the household receives from the municipal government. Regressions include village fixed-effects. All regressions control for the number of men age 15-29, 30-49 and 50+, the number of women age 15-29, 30-49 and 50+, the number of boys age less than 1, 1-5 and 6-14, the number of girls age less than 1, 1-5 and 6-14, whether the household is classified as poor, the household predicted per capita income, the household's head gender, marital status, age, education, length of stay in the village of current residence and occupation. In Panel A, regressions control for distance to the mayor (Columns 1 and 4), to the vice-mayor (Columns 2 and 4), to municipal councillors (Columns 3-4). In Panel B, regressions control for distance to the mayor, the vice-mayor and municipal councillors. In Panel B, regressions control for distance to losing candidates for mayor (Columns 1 and 4), for vice-mayor (Columns 2 and 4), and for municipal councillors (Columns 3-4). The standard errors (in parentheses) account for potential correlation within municipality. * denotes significance at the 10%, ** at the 5% and, *** at the 1% level.

Table 5: Controlling for Other Centrality Measures

	(1)	(2)	(3)	(4)	(5)	(6)
Between		0.028***		0.027***		0.028***
		(0.004)		(0.004)		(0.003)
Katz	0.013***	-0.005				
	(0.005)	(0.005)				
Degree			0.015***	-0.003		
			(0.004)	(0.005)		
Eigenvector					0.005	-0.008
					(0.005)	(0.005)
Observations	1,657,146	1,657,146	1,657,146	1,657,146	1,657,146	1,657,146
R-squared	0.357	0.358	0.357	0.358	0.357	0.358

Notes: Results from household-level regressions. The dependent variable is the number of services the household receives from the municipal government. Regressions include village fixed-effects. In Columns 2, 4 and 6, regressions control for the number of men age 15-29, 30-49 and 50+, the number of women age 15-29, 30-49 and 50+, the number of boys age less than 1, 1-5 and 6-14, the number of girls age less than 1, 1-5 and 6-14, whether the household is classified as poor, the household predicted per capita income, the household's head gender, marital status, age, education, length of stay in the village of current residence and occupation as well as distance to the mayor, the vice-mayor and municipal councillors. The standard errors (in parentheses) account for potential correlation within municipality. * denotes significance at the 10%, ** at the 5% and, *** at the 1% level.

Table 6: Further Ruling out an Information Story

	(1)	(2)	(3)	(4)	(5)	(6)
		Less than			Between	
	25 %	30 %	35 %	22.5-27.5%	20-30 %	17.5-32.5%
Between	1.079***	1.054***	1.017***	1.144***	1.152***	1.148***
	(0.167)	(0.173)	(0.177)	(0.156)	(0.159)	(0.161)
Eligible	-4.501***	-4.514***	-4.577***	-1.169***	-1.170***	-1.270***
	(0.248)	(0.245)	(0.242)	(0.282)	(0.205)	(0.182)
Between*Eligible	0.109	0.186	0.256	0.434	0.140	0.112
	(0.258)	(0.252)	(0.248)	(0.460)	(0.317)	(0.291)
Observations	1,657,146	1,657,146	1,657,146	1,657,146	1,657,146	1,657,146
R-squared	0.303	0.303	0.304	0.302	0.302	0.302

Notes: Results from household-level regressions. The dependent variable is the number of services the household receives from the municipal government. Regressions include village fixed-effects. Regressions control for the number of men age 15-29, 30-49 and 50+, the number of women age 15-29, 30-49 and 50+, the number of boys age less than 1, 1-5 and 6-14, the number of girls age less than 1, 1-5 and 6-14, whether the household is classified as poor, the household predicted per capita income, the household's head gender, marital status, age, education, length of stay in the village of current residence and occupation as well as distance to the mayor, the vice-mayor and municipal councillors. The standard errors (in parentheses) account for potential correlation within municipality. * denotes significance at the 10%, ** at the 5% and, *** at the 1% level.

Table 7: Robustness Checks

	(1)	(2)	(3)	(4)	(5)	(6)
Between	0.029***	0.017***	0.016***	0.024***	0.021***	0.025***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)
Additional Controls	No	No	No	No	Obs. Assets	Name
Sample	No ARMM	No Outliers [Municipality]	No Outliers [Village]	Exc. Large and Small Munis	Full	Full
Observations	1,318,499	1,322,317	1,321,698	1,165,172	1,657,146	1,650,088
R-squared	0.315	0.360	0.359	0.378	0.366	0.358

Notes: Results from household-level regressions. The dependent variable is the number of services the household receives from the municipal government. Regressions include village fixed-effects. All regressions control for the number of men age 15-29, 30-49 and 50+, the number of women age 15-29, 30-49 and 50+, the number of boys age less than 1, 1-5 and 6-14, the number of girls age less than 1, 1-5 and 6-14, whether the household is classified as poor, the household predicted per capita income, the household's head gender, marital status, age, education, length of stay in the village of current residence and occupation as well as distance to the mayor, the vice-mayor and municipal councillors. In Column 5, regression control for a number of observable household assets and characteristics. In Column 6, regressions control for measures of name origin and name complexity. The standard errors (in parentheses) account for potential correlation within municipality. * denotes significance at the 10%, ** at the 5% and, *** at the 1% level.

Table 8: Betweenness - Interaction Relative and Losing

	(1)	(2)
Panel A: Distance to the incumbent mayor		
Between X		
Distance 1	0.044	0.018
	(0.033)	(0.030)
Distance 2	0.074***	0.025***
	(0.008)	(0.007)
Distance 3	0.103***	0.039***
	(0.007)	(0.006)
Distance 4	0.134***	0.046***
	(0.011)	(0.009)
Distance 5	0.092***	0.016***
	(0.006)	(0.005)
Observations	1,657,146	1,657,146
R-squared	0.307	0.358
Panel B: Unsuccessful candidates' relatives		
Between	0.110***	0.029***
	(0.005)	(0.004)
Between X		
Losing Candidate's Relative	-0.045***	-0.015**
	(0.007)	(0.006)
Observations	1,657,146	1,657,146
R-squared	0.307	0.358

Notes: Results from household-level regressions. The dependent variable is the number of services the household receives from the municipal government. Regressions include village fixed-effects. In Column 2, regressions control for the number of men age 15-29, 30-49 and 50+, the number of women age 15-29, 30-49 and 50+, the number of boys age less than 1, 1-5 and 6-14, the number of girls age less than 1, 1-5 and 6-14, whether the household is classified as poor, the household predicted per capita income, the household's head gender, marital status, age, education, length of stay in the village of current residence and occupation as well as distance to the mayor, the vice-mayor and municipal councillors. The standard errors (in parentheses) account for potential correlation within municipality. * denotes significance at the 10%, ** at the 5% and, *** at the 1% level.

Table 9: Municipal-level Heterogeneity

	(1)	(2)	(3)	(4)	(5)	(6)
Between	0.091***	0.087***	0.091***	0.027***	0.026***	0.026***
	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)
Between*Vote Margin	-0.011**		-0.013***	-0.008**		-0.009**
	(0.005)		(0.005)	(0.004)		(0.004)
Between*Population		0.009**	0.009***		0.007*	0.008**
		(0.004)	(0.003)		(0.004)	(0.003)
Additional Controls	No	No	No	Yes	Yes	Yes
Observations	1,561,719	1,645,653	1,559,041	1,561,719	1,645,653	1,559,041
R-squared	0.293	0.306	0.292	0.346	0.356	0.346

Notes: Results from household-level regressions. The dependent variable is the number of services the household receives from the municipal government. All regressions include village fixed-effects. In Columns 4-6, regressions control for the number of men age 15-29, 30-49 and 50+, the number of women age 15-29, 30-49 and 50+, the number of boys age less than 1, 1-5 and 6-14, the number of girls age less than 1, 1-5 and 6-14, whether the household is classified as poor, the household predicted per capita income, the household's head gender, marital status, age, education, length of stay in the village of current residence and occupation as well as distance to the mayor, the vice-mayor and municipal councillors The standard errors (in parentheses) account for potential correlation within municipality. * denotes significance at the 10%, ** at the 5% and, *** at the 1% level.

Table 10: Allowing for Trade-offs Between Electoral Strategies

	(1)	(2)	(3)	(4)	(5)	(6)
	Dep Var: $\hat{\alpha}$					
$\hat{\beta}$	-0.251***	-0.247***	-0.251***	-0.249***	-0.257***	-0.256***
	(0.041)	(0.041)	(0.041)	(0.041)	(0.041)	(0.044)
Vote Margin		-0.104**	-0.111***	-0.116***	-0.080*	-0.068
		(0.041)	(0.042)	(0.042)	(0.044)	(0.047)
Population			0.087**	0.095**	0.067	0.059
			(0.041)	(0.044)	(0.044)	(0.046)
Poverty Incidence				0.024	0.056	0.061
				(0.044)	(0.045)	(0.049)
Gini					0.149***	0.156***
					(0.046)	(0.051)
p.c. IRA						0.047
						(0.045)
Observations	562	551	549	549	549	497
R-squared	0.063	0.073	0.080	0.080	0.098	0.091

Note: Results from municipal-level regressions. Each municipality is weighted by the number of household observations in the NHTS dataset. The dependent variable ($\hat{\alpha}$) is the normalized point estimate on the betweenness variable in a household-level regression estimated in each municipality.

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A.1 Alternative Targeting Strategy: Maximizing Political Influence

In Section 2 we assumed that politicians seek to mobilize a coalition of voting blocks in order to be elected. This is not the only objective that politicians may have. Another possibility is that the politician's objective is to have the most influence possible on a pre-existing social network. This influence can take many forms (e.g., transfer of information, propaganda, prestige) which we do not model in detail since they all yield the same key measures of centrality.

Following Katz (1963) we assume that the influence that individual i has on an arbitrary member j of the social network depends (1) on the number of channels or 'walks' that connect i to j and (2) on the distance between i and j along each of these walks. Behind this assumption is the observation that influence through social networks is reinforced if it originates from multiple channels. To capture this idea in a straightforward manner, Katz proposes a functional form for influence in which a walk of length 1 is worth a, a walk of length 2 is worth a^2, and a walk of length k is worth a^k, for some parameter $0 < a < 1$. In applications, we can think of a as some measure of decay of the influence that i has on other nodes. The closer other nodes are to i, the more influence i has on them, and the more channels from i to j there are, the more influence i has on j.

Let g denote the $n \times n$ adjacency matrix of the undirected social network with n individuals or nodes. An element ij of this symmetric matrix is equal to 1 if i and j are directly connected to each other, and 0 otherwise. Following standard practice, the diagonal of g is 0 everywhere. Let $\mathbf{1}$ denote an $n \times 1$ vector of 1's. We have $g\mathbf{1}$ is the vector of degrees of nodes, which tells us how many walks of length 1 emanate from each node. By extension, $g^k\mathbf{1}$ is the total number of walks of length k emanating from each node. Thus the vector of the influence of nodes can be written as:

$$\begin{aligned} P^{K2}(g,a) &\equiv ag\mathbf{1}+a^2g^2\mathbf{1}+a^3g^3\mathbf{1}+... \\ &= (I+ag+a^2g^2+...)ag\mathbf{1} \\ &= (I-ag)^{-1}ag\mathbf{1} \text{ for a small enough } a \end{aligned}$$

This measure of influence is called *Katz second prestige measure*. For node i, this measure is a weighted sum of the walks emanating from i. Note that for the measure to be defined, a must be small enough. A sufficient condition is that a be smaller than the largest eigenvalue of g, and for this to be true it is sufficient that a be smaller than 1 over the maximum degree of any agent.

Now suppose that a politician can target public services to one individual in exchange for exerting influence in the politician's favor. It is optimal for the politician to target the most influential individual whose interests are otherwise aligned to those of the politician.[24] In the context of our study, this would imply selecting the person with the highest prestige measure $P^{K2}(g, a)$ among close and distant relatives.

Other measures of influence in social networks have been proposed. Katz also proposed another measure of centrality based on influence or prestige. The idea behind the measure is that the more influential i's neighbors are, the more influential i is. The measure, which is called Katz first prestige measure $P_i^K(g)$, defines the influence or prestige of node i as the sum of the influence or prestige of i's neighbors divided by their respective degrees:

$$P_i^K(g) \equiv \sum_{j \neq i} g_{ij} \frac{P_j^K(g)}{d_j(g)}$$

Since this definition is self-referential, we need to solve it as a system of equation. Let $\widehat{g}_{ij} \equiv g_{ij}/d_j(g)$. Solving for the vector $P^K(g)$ yields:

$$\begin{aligned} P^K(g) &= \widehat{g} P^K(g) \\ (I - \widehat{g}) P^K(g) &= 0 \end{aligned}$$

where I is an identity matrix of size n. Calculating the Katz first prestige measures reduces to finding the unit eigenvector of $\widehat{g}$.[25] In undirected networks such as ours, $P^K(g)$ boils down to the degree of each node (up to a multiplicative scalar).

A similar notion is the eigenvector centrality proposed by Bonacich. The idea is that the

[24] For simplicity, we ignore issues of targeting multiple individuals, or of individuals receiving favors from multiple politicians. This is akin to assuming that the social network is large and the number of target nodes is small relative to the size of the network.

[25] Note that $P^K(g)$ is only determined up to a scale factor: if $P^K(g)$ solves the above, so does $cP^K(g)$.

influence of a node is proportional to the sum of the influence of its neighbors. The only difference with Katz first prestige measure is that we do not normalize by the degree of each node. Eigenvector centrality is defined as the vector $C^e(g)$ that solves:

$$\lambda C^e(g) = gC^e(g)$$

Solving the above yields multiple eigenvectors and corresponding eigenvalues. The standard convention is to look for the eigenvector associated with the largest eigenvalue – which for a network has to be positive.[26] In our empirical analysis we try each of these measures separately and jointly.

[26]This measure has been further generalized by Bonacich as follows. Bonacich centrality $Ce^B(g, a, b)$ is defined as

$$Ce^B(g, a, b) \equiv (I - bg)^{-1} ag\mathbf{1}$$

for scalars $1 \geq a > 0$ and $b > 0$ and b sufficiently small so that the above is well defined. In this formula, b captures how i's influence decays with distance while a captures the base value of each node. If $a = b$ then $Ce^B(g, a, b) = P^{K2}(g, a)$.

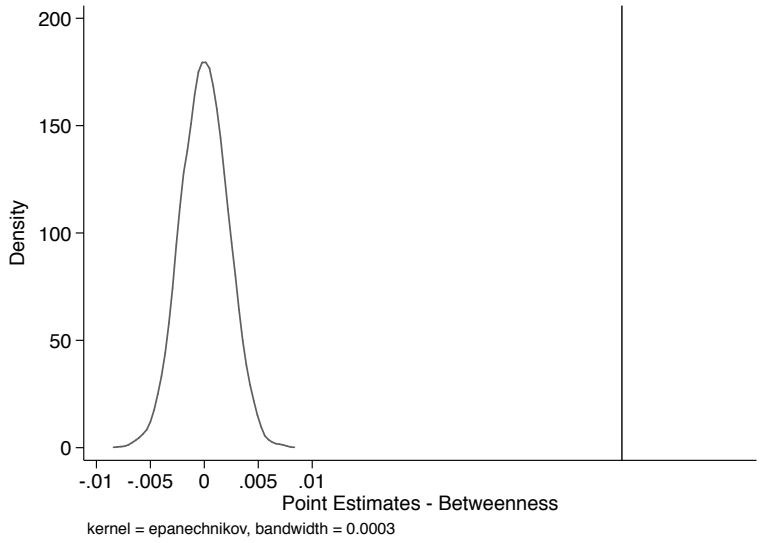

Figure A.1: Distribution of point estimates on the betweenness centrality measure. Each point estimate is obtained from estimating equation (2) on a placebo dataset where the centrality values are randomly re-allocated across households within the same municipality

Table A.1: Betweenness and Receipt of Government Services - (Alternative Measures)

	(1)	(2)	(3)	(4)	(5)	(6)
		Rank			Normalized	
		Municipal	Village	Overall	Municipal	Village
Panel A: Maximum betweenness (household)						
Between	5.296**	0.026***	0.025***	0.002**	0.003***	0.003***
	(2.094)	(0.003)	(0.003)	(0.001)	(0.001)	(0.001)
Observations	1,657,146	1,657,146	1,657,146	1,657,146	1,657,146	1,657,141
R-squared	0.357	0.358	0.358	0.357	0.357	0.357
Panel B: Mean Betweenness (household)						
Between	11.540***	0.029***	0.028***	0.003***	0.004***	0.004***
	(3.260)	(0.003)	(0.003)	(0.001)	(0.001)	(0.001)
Observations	1,657,146	1,657,146	1,657,146	1,657,146	1,657,146	1,657,141
R-squared	0.357	0.358	0.358	0.357	0.357	0.357

Notes: Results from household-level regressions. The dependent variable is the number of services the household receives from the municipal government. Regressions include village fixed-effects. Regressions control for the number of men age 15-29, 30-49 and 50+, the number of women age 15-29, 30-49 and 50+, the number of boys age less than 1, 1-5 and 6-14, the number of girls age less than 1, 1-5 and 6-14, whether the household is classified as poor, the household predicted per capita income, the household's head gender, marital status, age, education, length of stay in the village of current residence and occupation as well as distance to the mayor, the vice-mayor and municipal councillors. The standard errors (in parentheses) account for potential correlation within municipality. * denotes significance at the 10%, ** at the 5% and, *** at the 1% level.

Table A.2: Betweenness and Receipt of Government Services (Excluding 'Other' Category')

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: # Services received						
Between	0.112***	0.111***	0.102***	0.056***	0.039***	0.038***
	(0.006)	(0.005)	(0.004)	(0.003)	(0.003)	(0.003)
Fixed effects	None	Municipal	Village	Village	Village	Village
Observations	1,657,146	1,657,146	1,657,146	1,657,146	1,657,146	1,657,146
R-squared	0.001	0.206	0.279	0.325	0.334	0.335
Panel B: # Services received | receiving at least one service						
Between	0.059***	0.070***	0.066***	0.036***	0.025***	0.025***
	(0.006)	(0.005)	(0.004)	(0.004)	(0.003)	(0.003)
Fixed effects	None	Municipal	Village	Village	Village	Village
Observations	730,189	730,189	730,189	730,189	730,189	730,189
R-squared	0.000	0.131	0.207	0.244	0.249	0.250
Panel C: Receiving at least one service						
Between	0.057***	0.055***	0.051***	0.030***	0.021***	0.021***
	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Fixed effects	None	Municipal	Village	Village	Village	Village
Observations	1,657,146	1,657,146	1,657,146	1,657,146	1,657,146	1,657,146
R-squared	0.001	0.220	0.280	0.314	0.324	0.325

Notes: Results from household-level regressions. The dependent variable is the number of services (excluding the 'other' category) the household receives from the municipal government (Panels A and B) and a dummy capturing whether the household receives at least one service; excluding the 'other' category (Panel C). Regressions include municipal fixed effects (Column 2) and village fixed effects (Column 3-6). In Columns 4-6, regressions control for the number of men age 15-29, 30-49 and 50+, the number of women age 15-29, 30-49 and 50+, the number of boys age less than 1, 1-5 and 6-14., the number of girls age less than 1, 1-5 and 6-14, whether the household is classified as poor and the household predicted per capita income. Regressions control for the household's head gender, marital status, age, education and length of stay in the village of current residence (Column 5-6). Regressions control for the household's head occupation (Column 6). The standard errors (in parentheses) account for potential correlation within municipality. * denotes significance at the 10%, ** at the 5% and, *** at the 1% level.

Table A.3: Betweenness and Receipt of Services from the Government: Exclude individuals connected to politicians

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: # Services received						
Between	0.101***	0.116***	0.109***	0.059***	0.039***	0.039***
	(0.014)	(0.006)	(0.005)	(0.004)	(0.004)	(0.004)
Fixed effects	None	Municipal	Village	Village	Village	Village
Observations	1,117,896	1,117,896	1,117,896	1,117,896	1,117,896	1,117,896
R-squared	0.001	0.234	0.307	0.348	0.356	0.357
Panel B: # Services received | receiving at least one service						
Between	0.064***	0.090***	0.085***	0.044***	0.030***	0.030***
	(0.012)	(0.006)	(0.006)	(0.004)	(0.004)	(0.004)
Fixed effects	None	Municipal	Village	Village	Village	Village
Observations	534,643	534,643	534,643	534,643	534,643	534,643
R-squared	0.000	0.141	0.217	0.254	0.259	0.260
Panel C: Receiving at least one service						
Between	0.045***	0.049***	0.047***	0.028***	0.018***	0.017***
	(0.007)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)
Fixed effects	None	Municipal	Village	Village	Village	Village
Observations	1,117,896	1,117,896	1,117,896	1,117,896	1,117,896	1,117,896
R-squared	0.001	0.244	0.303	0.330	0.338	0.339

Notes: Results from household-level regressions. The dependent variable is the number of services the household receives from the municipal government (Panels A and B) and a dummy capturing whether the household receives at least one service (Panel C). Regressions include municipal fixed effects (Column 2) and village fixed effects (Column 3-6). In Columns 4-6, regressions control for the number of men age 15-29, 30-49 and 50+, the number of women age 15-29, 30-49 and 50+, the number of boys age less than 1, 1-5 and 6-14., the number of girls age less than 1, 1-5 and 6-14, whether the household is classified as poor and the household predicted per capita income. Regressions control for the household's head gender, marital status, age, education and length of stay in the village of current residence (Column 5-6). Regressions control for the household's head occupation (Column 6). The standard errors (in parentheses) account for potential correlation within municipality. * denotes significance at the 10%, ** at the 5% and, *** at the 1% level.

Table A.4: Betweenness and Receipt of Services from the Government: Continuous controls

	(1)	(2)	(3)
Panel A: # Services received			
Between	0.063***	0.038***	0.039***
	(0.003)	(0.003)	(0.003)
Observations	1,657,146	1,657,146	1,657,146
R-squared	0.346	0.351	0.353
Panel B: # Services received | receiving at least one service			
Between	0.044***	0.028***	0.028***
	(0.004)	(0.003)	(0.003)
Observations	813,383	813,383	813,383
R-squared	0.251	0.254	0.254
Panel C: Receiving at least one service			
Between	0.030***	0.019***	0.019***
	(0.002)	(0.002)	(0.002)
Observations	1,657,146	1,657,146	1,657,146
R-squared	0.327	0.333	0.334

Notes: Results from household-level regressions with village fixed-effects. The dependent variable is the number of services the household receives from the municipal government (Panels A and B) and a dummy capturing whether the household receives at least one service (Panel C). Regressions include municipal fixed effects (Column 2) and village fixed effects (Column 3-6). In Columns 4-6, regressions control for the number of men age 15-29, 30-49 and 50+, the number of women age 15-29, 30-49 and 50+, the number of boys age less than 1, 1-5 and 6-14., the number of girls age less than 1, 1-5 and 6-14, whether the household is classified as poor and the household predicted per capita income. Regressions control for the household's head gender, marital status, age, education and length of stay in the village of current residence (Column 5-6). Regressions control for the household's head occupation (Column 6). The standard errors (in parentheses) account for potential correlation within municipality. * denotes significance at the 10%, ** at the 5% and, *** at the 1% level.

Table A.5: All Services

	(1) philhealth	(2) rice	(3) day care	(4) feeding	(5) microcredit	(6) livelihood	(7) scholarship	(8) self emp.	(9) cash transfer	(10) housing	(11) other
Mean Dep. Var	27.4	17.8	7.7	5.9	2.5	1.9	1.8	.9	.9	.5	9.6
Panel A: Village fixed effects											
Between	4.112***	1.787***	1.802***	1.183***	0.539***	0.403***	0.219***	0.089***	0.108**	-0.003	0.089
	(0.214)	(0.138)	(0.112)	(0.091)	(0.064)	(0.045)	(0.039)	(0.027)	(0.042)	(0.027)	(0.088)
Observations	1,657,146	1,657,146	1,657,146	1,657,146	1,657,146	1,657,146	1,657,146	1,657,146	1,657,146	1,657,146	1,657,146
R-squared	0.264	0.299	0.138	0.137	0.117	0.093	0.052	0.096	0.175	0.129	0.344
Panel B: Village fixed effects + household controls											
Between	1.732***	0.701***	0.498***	0.378***	0.206***	0.195***	0.019	0.012	0.079**	-0.019	0.073
	(0.151)	(0.114)	(0.076)	(0.070)	(0.049)	(0.040)	(0.036)	(0.026)	(0.036)	(0.027)	(0.082)
Observations	1,657,146	1,657,146	1,657,146	1,657,146	1,657,146	1,657,146	1,657,146	1,657,146	1,657,146	1,657,146	1,657,146
R-squared	0.306	0.325	0.182	0.162	0.124	0.098	0.066	0.102	0.177	0.130	0.346

Notes: Results from household-level regressions with village fixed-effects. The dependent variable is the number of services the household receives from the municipal government. Regressions include village fixed-effects. In Panel B, regressions control for the number of men age 15-29, 30-49 and 50+, the number of women age 15-29, 30-49 and 50+, the number of boys age less than 1, 1-5 and 6-14, the number of girls age less than 1, 1-5 and 6-14, whether the household is classified as poor, the household predicted per capita income, the household's head gender, marital status, age, education, length of stay in the village of current residence and occupation as well as distance to the mayor, the vice-mayor and municipal councillors. The standard errors (in parentheses) account for potential correlation within municipality. * denotes significance at the 10%, ** at the 5% and, *** at the 1% level.

Table A.6: Controlling for Other Centrality Measures

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Max centrality (normalized)						
Between		0.003***		0.003***		0.003***
		(0.001)		(0.001)		(0.001)
Katz	0.001	-0.001				
	(0.001)	(0.001)				
Degree			0.002*	0.000		
			(0.001)	(0.001)		
Eigenvector					-0.001	-0.002*
					(0.001)	(0.001)
Observations	1,657,146	1,657,146	1,657,146	1,657,146	1,657,146	1,657,146
R-squared	0.357	0.357	0.357	0.357	0.357	0.357
Panel B: Mean centrality (percentile rank)						
Between		0.033***		0.032***		0.033***
		(0.004)		(0.004)		(0.004)
Katz	0.012***	-0.008				
	(0.005)	(0.005)				
Degree			0.014***	-0.007		
			(0.004)	(0.005)		
Eigenvector					0.003	-0.012**
					(0.005)	(0.005)
Observations	1,657,146	1,657,146	1,657,146	1,657,146	1,657,146	1,657,146
R-squared	0.357	0.358	0.357	0.358	0.357	0.358
Panel C: Mean centrality (normalized)						
Between		0.005***		0.004***		0.004***
		(0.001)		(0.001)		(0.001)
Katz	0.000	-0.002**				
	(0.001)	(0.001)				
Degree			0.002	-0.001		
			(0.001)	(0.001)		
Eigenvector					-0.001	-0.002***
					(0.001)	(0.001)
Observations	1,657,146	1,657,146	1,657,146	1,657,146	1,657,146	1,657,146
R-squared	0.357	0.357	0.357	0.357	0.357	0.357

Notes: Results from household-level regressions. The dependent variable is the number of services the household receives from the municipal government. Regressions include village fixed-effects. In Columns 2, 4 and 6, regressions control for the number of men age 15-29, 30-49 and 50+, the number of women age 15-29, 30-49 and 50+, the number of boys age less than 1, 1-5 and 6-14, the number of girls age less than 1, 1-5 and 6-14, whether the household is classified as poor, the household predicted per capita income, the household's head gender, marital status, age, education, length of stay in the village of current residence and occupation as well as distance to the mayor, the vice-mayor and municipal councillors. The standard errors (in parentheses) account for potential correlation within municipality. * denotes significance at the 10%, ** at the 5% and, *** at the 1% level.

Table A.7: Further Ruling out an Information Story - Equivalence Scales (1)

	(1)	(2)	(3)	(4)	(5)	(6)
		Less than			Between	
	25 %	30 %	35 %	22.5-27.5%	20-30 %	17.5-32.5%
Between	1.050***	1.059***	1.076***	1.169***	1.167***	1.214***
	(0.167)	(0.168)	(0.175)	(0.159)	(0.159)	(0.163)
Eligible	-4.806***	-4.813***	-4.760***	-1.296***	-1.496***	-1.458***
	(0.244)	(0.237)	(0.236)	(0.280)	(0.204)	(0.189)
Between*Eligible	0.167	0.091	0.035	-0.121	-0.034	-0.353
	(0.258)	(0.238)	(0.227)	(0.493)	(0.337)	(0.281)
Observations	1,657,146	1,657,146	1,657,146	1,657,146	1,657,146	1,657,146
R-squared	0.304	0.304	0.304	0.302	0.302	0.303

Notes: Results from household-level regressions. The dependent variable is the number of services the household receives from the municipal government. Regressions include village fixed-effects. Regressions control for the number of men age 15-29, 30-49 and 50+, the number of women age 15-29, 30-49 and 50+, the number of boys age less than 1, 1-5 and 6-14, the number of girls age less than 1, 1-5 and 6-14, whether the household is classified as poor, the household predicted per capita income, the household's head gender, marital status, age, education, length of stay in the village of current residence and occupation as well as distance to the mayor, the vice-mayor and municipal councillors. The standard errors (in parentheses) account for potential correlation within municipality. * denotes significance at the 10%, ** at the 5% and, *** at the 1% level.

Table A.8: Further Ruling out an Information Story - Equivalence Scales (2)

	(1)	(2)	(3)	(4)	(5)	(6)
		Less than			Between	
	25 %	30 %	35 %	22.5-27.5%	20-30 %	17.5-32.5%
Between	1.050***	1.059***	1.076***	1.169***	1.167***	1.214***
	(0.167)	(0.168)	(0.175)	(0.159)	(0.159)	(0.163)
Eligible	-4.806***	-4.813***	-4.760***	-1.296***	-1.496***	-1.458***
	(0.244)	(0.237)	(0.236)	(0.280)	(0.204)	(0.189)
Between*Eligible	0.167	0.091	0.035	-0.121	-0.034	-0.353
	(0.258)	(0.238)	(0.227)	(0.493)	(0.337)	(0.281)
Observations	1,657,146	1,657,146	1,657,146	1,657,146	1,657,146	1,657,146
R-squared	0.304	0.304	0.304	0.302	0.302	0.303
Between	1.062***	1.039***	1.078***	1.194***	1.158***	1.164***
	(0.167)	(0.171)	(0.176)	(0.160)	(0.161)	(0.162)
Eligible	-4.609***	-4.665***	-4.618***	-1.075***	-1.410***	-1.544***
	(0.244)	(0.234)	(0.241)	(0.257)	(0.193)	(0.183)
Between*Eligible	0.168	0.212	0.055	-0.577	0.065	-0.012
	(0.258)	(0.241)	(0.235)	(0.432)	(0.322)	(0.278)
Observations	1,657,146	1,657,146	1,657,146	1,657,146	1,657,146	1,657,146
R-squared	0.303	0.304	0.304	0.302	0.302	0.303

Notes: Results from household-level regressions. The dependent variable is the number of services the household receives from the municipal government. Regressions include village fixed-effects. Regressions control for the number of men age 15-29, 30-49 and 50+, the number of women age 15-29, 30-49 and 50+, the number of boys age less than 1, 1-5 and 6-14, the number of girls age less than 1, 1-5 and 6-14, whether the household is classified as poor, the household predicted per capita income, the household's head gender, marital status, age, education, length of stay in the village of current residence and occupation as well as distance to the mayor, the vice-mayor and municipal councillors. The standard errors (in parentheses) account for potential correlation within municipality. * denotes significance at the 10%, ** at the 5% and, *** at the 1% level.

Table A.9: Municipal-level Heterogeneity

	(1)	(2)	(3)	(4)	(5)	(6)
Between	0.091***	0.087***	0.091***	0.027***	0.026***	0.027***
	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)
Between*Vote Share	-0.012***		-0.013***	-0.008**		-0.009**
	(0.005)		(0.005)	(0.004)		(0.004)
Between*Population		0.009**	0.009***		0.007*	0.007**
		(0.004)	(0.003)		(0.004)	(0.003)
Additional Controls	No	No	No	Yes	Yes	Yes
Observations	1,561,719	1,645,653	1,559,041	1,561,719	1,645,653	1,559,041
R-squared	0.293	0.306	0.292	0.346	0.356	0.345

Notes: Results from household-level regressions. The dependent variable is the number of services the household receives from the municipal government. All regressions include village fixed-effects. In Columns 4-6, regressions control for the number of men age 15-29, 30-49 and 50+, the number of women age 15-29, 30-49 and 50+, the number of boys age less than 1, 1-5 and 6-14, the number of girls age less than 1, 1-5 and 6-14, whether the household is classified as poor, the household predicted per capita income, the household's head gender, marital status, age, education, length of stay in the village of current residence and occupation as well as distance to the mayor, the vice-mayor and municipal councillors. The standard errors (in parentheses) account for potential correlation within municipality. * denotes significance at the 10%, ** at the 5% and, *** at the 1% level.

Table A.10: Allowing for Trade-offs Between Electoral Strategies (unweighted)

	(1)	(2)	(3)	(4)	(5)	(6)
	Dep Var: $\hat{\alpha}$					
$\hat{\beta}$	-0.563***	-0.563***	-0.565***	-0.554***	-0.558***	-0.524***
	(0.040)	(0.041)	(0.041)	(0.041)	(0.041)	(0.045)
Vote Margin		-0.098	-0.096	-0.074	-0.061	-0.063
		(0.064)	(0.064)	(0.065)	(0.067)	(0.071)
Population			0.073	0.054	0.033	0.119
			(0.103)	(0.104)	(0.106)	(0.113)
Poverty Incidence				-0.122**	-0.116*	-0.058
				(0.062)	(0.062)	(0.069)
Gini					0.065	0.126*
					(0.066)	(0.074)
p.c. IRA						0.141***
						(0.038)
Observations	562	551	549	549	549	497
R-squared	0.262	0.266	0.267	0.272	0.273	0.297

Note: Results from municipal-level regressions. The dependent variable ($\hat{\alpha}$) is the normalized point estimate on the betweenness variable in a household-level regression estimated in each municipality.