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7/18/08
4:00 pm

The Efficacy of Parochial Politics: Caste, Commitment, and Competence in Indian Local Governments *

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May 2008

Abstract

This paper proposes a novel explanation for the emergence and persistence of parochial politics, based on the idea that strong social institutions can discipline the leaders they put forward, successfully substituting for secular political institutions when they are ineffective. Using unique data on Indian local governments at the ward level over multiple terms, and exploiting the randomized election reservation system, we find that the presence of a numerically dominant sub-caste (caste equilibrium) is associated with the selection of leaders with superior observed characteristics and by greater public goods provision. This improvement in leadership competence occurs without apparently diminishing leaders' responsiveness to their constituency.

*We thank Ashley Lester for initial collaboration on this project and Brian Knight and Pedro Dal Bo for many useful discussions. Munshi acknowledges research support from the National Science Foundation through grant SES-0617847. We are responsible for any errors that may remain.

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1 Introduction

Ethnic, linguistic, and caste identity dominate political life throughout the world. In India, the setting for this paper, caste politics appears to have grown stronger over time (Banerjee and Pande 2007) and a similar persistence in ethno-linguistic politics has been documented in countries at various stages of economic development (Horowitz 1985, Posner 2005). The standard explanation for the emergence and the persistence of parochial politics is that social loyalty gives leaders leverage when political institutions are weak, allowing them to appropriate substantial rents for themselves in return for the patronage they provide to their supporters (La Ferrara and Bates 2001, Padro i Miquel 2007). Parochial politics is thus associated with corrupt rulers (kleptocracies), wasteful patronage transfer, and low levels of public good provision. In this paper we use new data on local public goods provision and electorate and elected leader characteristics to assess an alternative theoretical hypothesis - that parochial politics can be welfare-enhancing in contexts where underlying social institutions are strong and can substitute for ineffective political institutions (parties) to discipline the leaders they put forward.

The classical Downsian (1957) model of political competition is not concerned with leaders' (or candidates') characteristics, focussing instead on the identity and the preferences of the pivotal voter. Recently, however, citizen-candidate models in which leaders cannot commit to implementing policies that diverge from their own preferences have generated much attention in the political economy literature. Osborne and Slivinski (1996) and Besley and Coate (1997) are the early contributions to this literature, which has now received empirical support both in the United States (Levitt 1996, List and Sturm 2006) and in developing countries (Pande 2003, Chattopadhyay and Duflo 2004). To understand the consequences of such an absence of leadership commitment, consider a political system in which elected representatives allocate a fixed level of resources to two public goods, sanitation and electricity, in their constituencies. Individuals are heterogeneous in two dimensions - in their preferences for public goods and their leadership ability. Assume that these two characteristics are correlated such that more able individuals prefer larger expenditures on electricity. With sufficiently low entry costs, the citizen-candidate model predicts that the winning candidate will be endowed with the median level of ability in the constituency and policy choices will coincide with the predictions of the Downsian model.

The predictions of the two models start to diverge, however, once we allow the overall level of resources to be determined endogenously by the ability of the elected leader. The tension that arises when commitment is absent is that the pivotal median voter would like to endorse the most able individual in the constituency as the leader but at the same time is aware that the share of resources subsequently allocated to electricity will exceed his own preferred allocation. In general, this implies that the leader will be endowed with greater ability than the median voter. If the cost of the mismatch in the preferred allocation of resources across public goods is sufficiently large, however, a mediocre leader will continue to be selected, with potentially substantial efficiency consequences.

In a well-functioning polity, a party apparatus could solve this commitment problem. The political party has been seen to provide voters with information (Caillaud and Tirole 2002), to screen candidates (Snyder and Ting 2002), and, most importantly, to ensure that candidates commit to the party platform once they are elected to office (Alesina and Spear 1988, Harrington 1992). In countries with weak parties, as in much of the developing world, existing social ties could be exploited instead to ensure that elected leaders do not renege on their commitments. In India, networks organized around the endogamous sub-caste or *jati* have been seen to solve information and commitment problems in the credit market (Banerjee and Munshi 2004), the labor market (Munshi and Rosenzweig 2006), and to provide mutual insurance (Munshi and Rosenzweig 2005). Just as social networks appear to solve commitment problems in the market, it may be the case that local leaders who are elected with the support of their sub-caste will make decisions that reflect the preferences of the group, even if they do not expect to be elected in the future, to avoid the social and economic punishment they would face if they chose their individually optimal policies instead. Within the context of the simple example outlined above, this would allow the numerically-dominant caste in a constituency to select its most competent member as the leader, while at the same time ensuring that his choices would reflect the preferences of the median individual in the group (although not the constituency).

A number of recent papers have focused on the vertical (competence) dimension of leadership quality, studying how outside options and compensation in office shape the pool of candidates and the subsequent effort that elected leaders exert (Caselli and Morelli 2004, Messner and Polborn 2004, Ferraz and Finan 2008). Other studies, using data from India, have attempted to identify the misallocation of resources due to corruption or elite capture, which can be interpreted as another dimension of competence. These studies find some evidence that leaders appropriate resources for themselves (Besley, Pande, and Rao 2007), but little support for the common perception that wealthy individuals in the village or high castes receive a disproportionate share of the resources that are allocated (Bardhan and Mookherjee 2006). By concentrating on the commitment problem, and its effect on leader selection, our analysis links the vertical dimension to the literature on political competition and political parties, which has otherwise restricted itself to the horizontal (valence) dimension of leadership quality. In our framework, a social institution – the caste – decouples these two dimensions of leadership quality, allowing the most competent leaders to be selected.

We exploit a unique local governance experiment that is currently under way in rural India to test the hypothesis that parochial politics - organized around the sub-caste - can be efficiency-enhancing. We focus on local political outcomes because sub-castes are too small to play a dominant role in state-level elections in India (Chhibber 1999). Groups of sub-castes must form coalitions in those elections, appealing to a broader caste identity among the voters. Without a mechanism to discipline leaders, caste-identity politics of this sort can have serious negative consequences, as documented by Banerjee and Pande (2007). At the local level, however, a sub-caste acting independently can win an election and subsequently maintain control of the leader who is elected.

The 73rd Amendment of the Constitution, passed in 1991, established a three-tier system of *panchayats* – at the village, block, and district level – with all seats to be filled by direct election. The village *panchayats*, which in practice often cover multiple villages, were divided into 10-15 wards in almost all states. *Panchayats* were given the power and the resources to make relatively substantial expenditures on public goods, and regular elections for the position of *panchayat* president and for each ward representative have been held every five years in most states (Chaudhuri 2003). Reservation of seats for historically disadvantaged groups – Scheduled Castes, Scheduled Tribes, Other Backward Castes, and women – was also introduced in the 73rd Amendment. Seats for each reserved category are assigned randomly across wards and, for the position of the president, randomly across *panchayats*, from one election to the next. This affords a unique opportunity to study the effect of exogenous leadership changes on the performance of the *panchayat*. Note that the changing requirements for leader qualifications across elections means that the discipline of re-election is almost entirely absent, making the commitment problem more acute.[1]

Previous studies have exploited the transformation of the *panchayat* system with the 73rd Amendment to test the citizen-candidate model by examining the distribution of public and private goods across and within villages (Chattopadhyay and Duflo 2004, Bardhan, Mookherjee, and Torrado 2005). Consistent with the absence of commitment, public good provision is higher in the *panchayat* presi-

[1]Our data indicate that only 13.9 percent of elected members of *panchayats* had run for office previously.

dent's village, and scheduled castes and tribes receive more resources when the president's position is reserved for a member of their group (Besley, Pande, Rahman, and Rao 2004, Bardhan, Mookherjee, and Torrado 2005, Duflo, Fischer, and Chattopadhyay 2005). Our analysis differs from this research in two important ways, however: First, in addition to testing for leadership commitment, we measure leadership competence based on the ward representative's ability to channel resources to his own constituency. Second, our analysis explicitly recognizes that reservation, by restricting the set of potential leaders, changes both the identity of the leader as well as the probability that a "caste equilibrium" with a numerically dominant caste and leadership commitment will emerge in the ward.

The data that we use in this paper are drawn from the latest (sixth) round of a nationally representative panel survey of rural Indian households carried out by the National Council of Applied Economic Research (NCAER) since the late 1960s. The current round has three components that are relevant for this study: (i) a census of all households in the approximately 250 villages covered by the survey, which enables the identification of the pivotal voter at the ward level by sub-caste; (ii) a village module that includes information on public good provision at the street level for each of three *panchayat* terms; and (iii) the characteristics of elected leaders in each ward in those terms, including the leader's sub-caste.

The survey data are indicative of the importance of local caste politics in India. Key informants were asked to list the various sources of support that the elected ward representatives received in each of the last three *panchayat* elections. As indicated in Table 1, caste is clearly the dominant source of support: 82 percent of the elected ward leaders received support from their caste inside the village and 29 percent received support from caste members outside the village. Religious groups and wealthy individuals are evidently much less prevalent sources of support and, more importantly, just 41 percent of local representatives are reported to have received support from a political party.

Following the discussion above, in section 2 of the paper we develop a model in which there are two dimensions to leadership quality: a horizontal (valence) dimension, measured by the difference between the leader's preferred mix of public goods and the preferred mix of the pivotal (median) voter, and a vertical (competence) dimension measured by his ability. In this framework, the median voter will be elected to represent the ward in the "non-caste equilibrium" when commitment is absent and the horizontal dimension is sufficiently dominant. However, if any sub-caste has greater than a 0.5 share in the ward, its collective welfare can be enhanced by nominating the most able member of the group as the representative and ensuring that he subsequently chooses the mix of projects favored by its median member. Some individuals outside the numerically dominant sub-caste whose preferences are close to those of the median member will also vote with it. However, commitment cannot be maintained outside the group, making larger coalitions of sub-castes difficult to sustain. Consequently, the first prediction of our framework is that the competence of the leader should increase discontinuously when the share of the numerically dominant caste in the ward crosses a threshold somewhere just below 0.5. The second prediction is that the level of public goods received by the ward should also increase discontinuously at that threshold.

To test these predictions using the survey data we take advantage of the fact that caste reservation exogenously changes the set of sub-castes that the leader can be drawn from, but leaves the electorate unchanged. This mechanically alters the share of the numerically dominant caste from one election to the next *within* each ward. Exploiting this within-ward variation, we find that the presence of a dominant caste results in the election of a wealthier leader, as well as a leader who is more likely to be in an occupation involving independent decision-making (farm operator, businessman, or professional). These results are obtained net of the effect of the change in the pool of eligible leaders associated with changing election reservations. Experimentation with alternative thresholds, moreover, reveals that it is only with thresholds close to 0.5 (above 0.35) that the presence of a dominant caste has a large and significant effect on the characteristics of the leader.

To test the second prediction of our framework linking the share of the dominant caste in the ward to the level of public goods received, we estimate ward-level demand functions for public goods using information on the share of households in the ward that benefited from expenditures on six local public goods – drinking water, sanitation facilities, improved roads, electricity, street lights, and telephone kiosks – in each of the three *panchayat* terms prior to the survey. The model indicates that the median individual in the *ward* is pivotal in the non-caste equilibrium, while the median individual in the *dominant caste* assumes that position in the caste equilibrium.

Our empirical results indicate that changes in the wealth and the occupation of the pivotal individual within a ward have a significant effect on the public goods allocated in the ward. Consistent with the findings on the characteristics of elected ward representatives, and given the composition of public goods demand in each ward, we find that the presence of a dominant caste increases the overall level of public goods received by the ward by 16 percent. Experimenting with alternative thresholds, there is a steep increase in the effect of the dominant caste on public good provision at the 0.35 threshold, followed by a flattening out, consistent with the idea that the political regime switches discontinuously from the non-caste to the caste equilibrium when the dominant group becomes sufficiently numerous. The analysis also allows us to identify leadership competence by caste and gender, and we find that women are more competent than the men in the caste equilibrium despite having significantly lower education and relevant labor market experience.[2]

The empirical analysis concludes with a test of leadership commitment. Here we exploit the fact that gender reservation is overlayed on caste reservation in India. Within a ward, for a given type of caste reservation (or open election), the share of the dominant caste will be the same across *panchayat* terms. If the ward representative's position is reserved for a woman in one of those terms, the allocation of public goods can be compared for male and female leaders to test for commitment. If the distribution of preferences for men and women differs sufficiently, the allocation of public goods could vary with the gender of the leader in the non-caste equilibrium, as in Chattopadhyay and Duflo (2004). The strong prediction of our model is that such differences should never be observed in the caste equilibrium, because both male and female leaders will choose projects that are aligned with the preferences of the pivotal individual in their group. We find that within a ward a change in the gender of the leader has no effect on the distribution of public goods when a dominant caste is present. In contrast, allocations differ consistently, at least with respect to at least one of the six public goods, when a dominant caste is absent. These results, taken together, suggest that in the context of Indian local governments, parochial politics appears to simultaneously increase both the competence and the commitment of elected leaders.

2 The Model

This section describes leader selection and subsequent policy choices in political systems with different levels of commitment. We begin by characterizing equilibrium outcomes for the canonical cases with and without commitment. Subsequently we derive conditions under which a caste equilibrium with commitment will emerge.

2.1 Individual Preferences and Leadership Quality

N individuals reside in a political constituency. Each individual i is endowed with a unique level of ability or competence $\omega_i \in [0, 1]$. Two public goods are provided in this economy. To highlight the trade-off between leader competence and public good preferences in equilibrium and to keep the

[2]This is consistent with recent evidence in Beaman et al. (2008).

model simple we assume that preferences and ability are isomorphic. Thus individual i receives the following utility from spending g_1, g_2 on the two goods:

$$U = (1 - \omega_i)ln(g_1) + \omega_i ln(g_2).$$

For a fixed amount of total resources, $G \equiv g_1 + g_2$, the preceding expression can be rewritten in terms of the corresponding shares, S_1, S_2:

$$U = (1 - \omega_i)ln(S_1) + \omega_i ln(S_2) + ln(G).$$

Utility is separable in the level of resources and the mix of goods, and for a given G it is straightforward to verify that utility is maximized at $S_2 = \omega_i$. More able individuals prefer to have a greater share of resources allocated to the second good.

The overall *level* of resources G and the *distribution* of these resources across the two goods S_2 is determined by the political leader selected by the residents of the constituency. The level of resources that this leader is able to provide is increasing in his ability. Without commitment, the leader will choose his most preferred mix of goods as derived above. Departing from the logarithmic specification to simplify the analysis and to highlight the tension between the vertical and the horizontal dimension of leadership quality when commitment is absent, individual i's utility when individual j (with higher ability) is selected as the leader is specified as $\beta\omega_j - \gamma(\omega_j - \omega_i)$.

The first term in the expression above represents the amount of resources that the leader can generate for his constituency, which we assume is increasing linearly in his ability. The second term represents the cost to individual i when a leader with different characteristics is chosen. This disutility is specified to be a linear function of the distance in ability-space, or the difference in their preferred share S_2, between the two individuals. Individual i would like the most able resident of the constituency to be the leader but is aware that this individual will also choose a mix of projects ω_j that differs from his own preferred mix ω_i. If the horizontal dimension dominates, $\gamma > \beta$, the linearity in our chosen specification implies that any individual i will prefer himself to any other individual in the constituency as the leader.[3] We assume that this condition holds in the discussion that follows to emphasize the importance of commitment in leadership selection.

[3] Individual i will certainly prefer himself to any individual with lower ability, since that individual will be dominated on both the horizontal and the vertical dimension. He will prefer himself to any individual j with higher ability if $\beta\omega_i > \beta\omega_j - \gamma(\omega_j - \omega_i)$, which is satisfied for $\gamma > \beta$.

2.2 The Political Equilibrium

Each resident in the constituency can choose to stand for election or not. The decision to stand is accompanied by an entry cost that is close to zero. After all residents have simultaneously made their entry decision, the election takes place and the candidate with the most votes is declared the leader. For simplicity we restrict our attention to single-candidate equilibria.[4] The discussion that follows characterizes the identity of the leader, the level of public goods, and the mix of those goods obtained for the canonical cases with and without leadership commitment.

A. Political Equilibrium without Commitment

With the cost of standing for election close to zero, the only strategy profile that can be supported as a Nash equilibrium has the individual with median ability in the constituency, m, standing for election, while all the other individuals stay out. This median individual will generate a level of resources βm (in utility units) and allocate a share m of these resources to the second public good.

Normalizing so that the utility obtained in a constituency without a leader is zero, the median individual will not wish to deviate from the equilibrium since $\beta m > 0$. No other individual wants to deviate and stand for election (with its associated cost) since he would receive fewer votes than the median individual. To see why even an individual with ability greater than m would not stand, consider a candidate with ability $\omega_j > m$. For any individual i with $\omega_i \leq m$, $\beta m - \gamma(m - \omega_i) > \beta\omega_j - \gamma(\omega_j - \omega_i)$ for $\gamma > \beta$. A majority of the electorate will thus continue to vote for the median individual.[5]

By a similar argument, no strategy profile in which someone other than the median voter stands for election can be supported as an equilibrium. When the cost of standing is close to zero, the median voter will always deviate from such an equilibrium, stand for election and subsequently get elected.

B. Political Equilibrium with Commitment

If all residents in the constituency belong to the same sub-caste and ex post *commitment can be ensured, the individual with maximum ability $\overline{\omega}$ will be selected as the leader. He generates a level of resources $\beta\overline{\omega}$ (in utility units) and allocates a share m of these resources to the second public good.*

[4] In fact, the election was uncontested in over 50 percent of our ward elections.

[5] Any individual with ability lower than m would certainly lose to the median individual since all individuals with ability greater than m would vote for the median individual. He has greater ability (competence) than his rival and is closer in ability-space (on the valence dimension) to them.

Allowing for lump-sum transfers between members of the sub-caste, the distribution of public goods will be chosen to maximize social welfare. If individuals are located symmetrically on each side of the median individual in ability-space and the social planner places equal weight on all members of the group, the mix of goods under the caste equilibrium will coincide with the prediction of the Downsian model, which is also the outcome without commitment when the cost of standing for election is sufficiently low. The overall level of resources, however, will be higher in the equilibrium with commitment, $\beta\overline{\omega} > \beta m$.

In the caste equilibrium, the able individual who is selected as the leader will make choices that are aligned with the preferences of the pivotal individual in his group as long as the group can punish him sufficiently severely for deviations from the socially optimal allocation. The sub-caste continues to facilitate economic activity along many dimensions in rural and urban India, as well as to provide social support for its members. Its ability to punish deviating members is consequently substantial, ensuring that the leaders it nominates will not renege on their commitments.

2.3 Equilibrium Selection

Although we assumed that all individuals in the constituency belonged to a single sub-caste when characterizing the equilibrium with commitment above, in practice the numerically dominant caste will account for a (possibly substantial) fraction of the population. The discussion that follows derives conditions under which a caste equilibrium will nevertheless be obtained. We assume that all the members of this caste are concentrated in a single segment of the ability distribution, ranging from $\underline{\omega}_c$ to $\overline{\omega}_c$. They are located symmetrically on both sides of the median member of their group, who is endowed with ability m_c. The rest of the population is located outside this segment and has no (alternative) caste affiliation.

Case 1: The numerically dominant caste accounts for the majority of the population in the constituency.

The most able member of the dominant caste will stand unopposed for election. He will generate a level of resources $\beta\overline{\omega}_c$ *(in utility units) and allocate a share* m_c *of total resources to the second public good.*

In the caste equilibrium all members of the dominant caste follow the command of the social planner without deviating. Thus to ensure that the proposed strategy profile is an equilibrium, we only need to verify that no other individual wants to deviate. Because the dominant caste has a majority and all members of that group will always vote for the selected candidate in a caste equilibrium, no individual outside the caste can ever win and so will not stand for election.

We also need to verify that no other strategy profile can be supported as an equilibrium. A strategy profile in which an individual with ability lower than $\underline{\omega}_c$ stands unopposed is clearly not an equilibrium since the representative (median) individual in the dominant caste would be better off on both the horizontal and the vertical dimension in the caste equilibrium. A strategy profile in which an individual with ability ω_j greater than $\overline{\omega}_c$ stands unopposed is also not an equilibrium. The median member of the dominant caste would once again prefer the caste equilibrium since $\beta\overline{\omega}_c > \beta\omega_j - \gamma(\omega_j - m_c)$ for $\gamma > \beta$.[6]

Case 2: The numerically dominant caste falls short of a majority and $\overline{\omega}_c < m$.

The median individual in the ward will stand unopposed for election. He will generate a level of resources βm (in utility units) and allocate a share m of these resources to the second public good.

No individual outside the dominant caste wants to stand against the median individual since he will certainly lose a straight contest, as described above. The caste representative with ability $\overline{\omega}_c$ will also lose to the median individual because all individuals with ability greater than or equal to m will prefer that individual (he has greater ability and is closer in ability-space to them). By the same argument, no other strategy profile can be an equilibrium since the median individual will always deviate and stand against the proposed candidate.

Case 3: The numerically dominant caste falls short of a majority and $\underline{\omega}_c > m$.

If the median individual in the ward prefers the caste representative to himself as the leader, then a caste equilibrium will be obtained in which a level of resources $\beta\overline{\omega}_c$ (in utility units) is provided and a share m_c of these resources is allocated to the second public good. If the median individual prefers himself as the leader, the corresponding level of resources will be m and the share allocated to the second good m as well.

The median individual prefers the caste representative to himself as the leader if $\beta\overline{\omega}_c - \gamma(m_c - m) > \beta m$. If this condition is satisfied, it is straightforward to verify that a strategy profile in which the dominant-caste representative stands unopposed is an equilibrium. Individuals with ability

[6] Rearranging terms, the inequality can be expressed as $\gamma(\omega_j - m_c) - \beta(\omega_j - \overline{\omega}_c) > 0$, which will be satisfied if $\gamma > \beta$ since $\omega_j - m_c > \omega_j - \overline{\omega}_c$. If members of the dominant caste are located symmetrically on either side of the median individual, then $\omega_i - m_c$ can be interpreted as the average distance in ability-space between members of that caste and the potential leader j. This would be the appropriate distance measure if the social planner in the dominant caste placed equal weight on all members of that group.

between m and $\underline{\omega}_c$ would prefer the caste representative to themselves and so would choose not to deviate.[7] Any individual with ability less than m would lose a straight contest with the dominant-caste representative because everyone with ability greater than or equal to m would vote for the representative.[8] Finally, individuals with ability greater than $\overline{\omega}_c$ would not benefit from standing since everyone with ability less than or equal to m would prefer the dominant-caste representative when $\gamma > \beta$, following the same argument as in Case 1.

Verifying that no other equilibrium can be supported when $\beta\overline{\omega}_c - \gamma(m_c - m) > \beta m$ is also straightforward. A strategy profile in which an individual other than the median individual from outside the dominant caste stands unopposed is not an equilibrium since the median individual would want to deviate and stand against him. A strategy profile in which the median individual stands unopposed is also not an equilibrium because the dominant caste would put its representative forward in that case and everyone with ability greater than or equal to m would vote for him.

Having established conditions under which a caste equilibrium is obtained, we now proceed to show that the unique equilibrium when $\beta\overline{\omega}_c - \gamma(m_c - m) < \beta m$ is characterized by the median individual standing for election unopposed. No individual outside the dominant caste wants to deviate from this equilibrium since he will certainly lose to the median individual in a direct contest. The dominant caste will also not deviate since its representative will now lose to the median voter in a straight contest, with all individuals with ability less than or equal to m voting for the median individual. By the same argument, no other strategy profile could be supported as an equilibrium since the median individual would always deviate and stand for election.

Case 4: The median individual, with ability m, is a member of the numerically dominant caste.

A caste equilibrium will always be obtained in this case, regardless of the size of the dominant caste. The caste representative will generate a level of resources $\beta\overline{\omega}_c$ (in utility units) and allocate a share m_c of total resources to the second public good.

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[7] We need to show that $\beta\overline{\omega}_c - \gamma(m_c - \omega_i) > \beta\omega_i$, for any individual with $\omega_i \in [m, \underline{\omega}_c)$. Rearranging the inequality, it is straightforward to show that

$$\frac{\beta}{\gamma}(\overline{\omega}_c - \omega_i) - (m_c - \omega_i) > \frac{(\omega_i - m)(\overline{\omega}_c - m_c)}{\overline{\omega}_c - m} > 0$$

when the median individual prefers the caste representative to himself as the leader.

[8] Individuals with ability between m and $\underline{\omega}_c$ prefer the caste representative to themselves as the leader and so would certainly prefer the caste representative to an individual with lower ability than them. Members of the dominant caste, with ability ranging from $\underline{\omega}_c$ to $\overline{\omega}_c$ will always vote for the caste representative. Individuals with ability greater than $\overline{\omega}_c$ will prefer the caste representative to a candidate with ability lower than m since the caste representative dominates his rival on both the vertical and the horizontal dimension.

To check whether a strategy profile in which the dominant-caste representative stands unopposed is an equilibrium, we only need to verify that no individual outside that caste would want to deviate (social pressures ensure that members of the dominant caste would never deviate). An individual with ability lower than $\underline{\omega}_c$ would certainly lose a straight contest with the caste representative since all members of the dominant caste and all individuals with ability greater than $\overline{\omega}_c$ would vote against him. An individual with ability greater than $\overline{\omega}_c$ would also lose such a contest, since all members of the dominant caste and individuals with ability less than $\underline{\omega}_c$ (using the same argument as in Case 1) would vote against him. Having established that no one would deviate from the proposed strategy profile, we finally rule out all other strategy profiles. A strategy profile in which any individual outside the dominant caste stood unopposed would never be an equilibrium since the caste representative would deviate and step forward, always winning the contest as described above.

2.4 Testable Predictions

Collecting the results from the previous section, a caste equilibrium will certainly be obtained if the share of the dominant caste exceeds 0.5. A caste equilibrium will also be obtained, even if the numerically dominant caste falls short of a majority, if $\underline{\omega}_c > m$ and $\beta\overline{\omega}_c - \gamma(m_c - m) > \beta m$. The caste representative cannot commit to implementing policies that diverge from the preferred choice of the median member of his group and so coalitions of sub-castes will generally be ruled out. Outsiders with preferences sufficiently close the preferences of the median individual in the dominant caste could, nevertheless, vote with it under the conditions derived above.

To better understand the conditions under which a caste equilibrium can be obtained even when the share of the dominant caste falls below 0.5, we rewrite the expression above as

$$\frac{\beta}{\gamma} > \frac{d_c}{d_c + S_c},$$

where $d_c \equiv m_c - m$ is the distance in ability-space between the median individual in the ward and the median individual in the dominant caste, and $S_c \equiv \overline{\omega}_c - m_c$ measures the size or share of that caste. It is straightforward to verify that the right hand side of the preceding inequality is increasing in d_c and decreasing in S_c. Holding the median-distance d_c constant, a caste equilibrium is more likely to be obtained with a larger caste. Holding caste size constant, a caste equilibrium is more likely to be obtained when the dominant caste occupies a position towards the center of the ability distribution. In the extreme case, when the median individual in the ward is a member of the dominant caste, $\underline{\omega}_c < m < \overline{\omega}_c$, we saw in Case 4 above that a caste equilibrium was always obtained, regardless of caste size.[9]

We will see below that the median-distance is declining monotonically with the share of the dominant caste in the range from 0 to 0.5. This implies that there exists a threshold $\underline{S}$ at which the non-caste equilibrium switches discontinuously to the caste equilibrium. Let the median ability in the dominant caste be uncorrelated with its size, $E(m_c) = m$, although we later relax this assumption in the empirical analysis. This implies that the leader's ability will increase discontinuously from m to $\overline{\omega}_c$ at the ability threshold. Holding the mean (or equivalently the median of the symmetric ability distribution) constant, the leader's ability will continue to grow steadily as the caste gets larger, but at a slower rate. Precisely the same discontinuous relationship should be obtained between the share of the dominant caste and the overall level of resources received by the ward, reflecting the one-to-one mapping between the leader's ability and the resources he can procure.

In the non-caste equilibrium without commitment, the mix of goods is aligned with the preferences of the median individual in the ward. In the caste equilibrium, the median individual in the dominant caste assumes that pivotal position. Thus, although leadership competence and the overall level of resources may increase in the caste equilibrium, the net effect on welfare is ambiguous. A welfare comparison of the alternative political equilibria is beyond the scope of this paper. We will, however, verify that the identity of the relevant pivotal individual, which varies across *panchayat* terms with changes in reservation, does affect the mix of goods received in the ward. We will also successfully test the hypotheses that overall resources increase and that commitment can be maintained in the caste equilibrium.

3 Empirical Analysis

3.1 The Data

The data that we use are unique in their geographic scope and detail. They are from the 2006 Rural Economic and Development Survey, the most recent round of a nationally representative survey of

[9] Once we allow for multiple sub-castes in the ward, a caste equilibrium could be enforced by a sub-caste that is (somewhat) smaller than the dominant caste but more centrally located in ability-space. In practice, however, there is a sharp drop in size from the numerically dominant caste in the ward to the next largest sub-caste. In our data, the average share of the dominant caste across wards is 0.64 versus 0.17 for the next largest sub-caste. Among the 32 percent of wards without any caste with a share above 0.5, the difference in the share for the two largest castes narrows but is still 0.13 (0.36 versus 0.23). It follows that the only feasible candidate to support a caste equilibrium in a ward will typically be the numerically dominant caste.

rural Indian households first carried out in 1968. The survey, administered by the National Council of Applied Economic Research, covers over 250 villages in 17 major state of India. We make use of two components of the survey data - the village census and the village inventory - for 13 states in which there were ward based elections and complete data in both components.[10] The census obtained information on all households in each of the sampled villages. These data indicate that on average there are 67 households per ward and 7 wards per village.

The complete census of households in the sampled villages allows us to compute the population share of the dominant caste and to identify the pivotal household/individual in each ward and *panchayat* term, depending on the nature of the reservation that is in place. Households provided their caste, sub-caste and religion. A sub-caste group is any set of households within a village reporting the same sub-caste name. Most of the Muslim households provided sub-caste (*biradari*) names. We also counted Muslim households within a village that were without a formal sub-caste name as a unique sub-caste. On average, there are six sub-castes per ward. We use the census information on the landholdings value of the household, the education (in years) of the household head, and information on the head's occupation to characterize the pivotal voter within the village and sub-caste groups. The census data also reveal for each household whether or not the household head or any family member was a candidate for election for the two last *panchayat* elections preceding the survey.

The village inventory includes a special module that obtained information on the characteristics of all of the elected leaders from each ward in each of the last three *panchayat* elections prior to the survey (sub-caste, education, occupation) as well as information on whether new construction or maintenance of specific public goods *actually* took place on each street in the village for each of the three *panchayat* terms. These local public goods include drinking water, sanitation, improved roads, electricity, street lights, and telecommunications (telephone kiosk). The data thus permit the mapping of street-level information into wards so that public goods expenditures can be allocated to each ward, and ward constituents, for each *panchayat* term. The combined data set covers 1085 wards in 136 villages. Ninety-five percent of the wards have information for at least two elections.

To estimate the effect of a dominant caste on leadership selection and public good provision, we take advantage of the randomized caste reservation in *panchayat* elections, which exogenously

[10]The states are Andhra Pradesh, Bihar, Chhattigarh, Gujarat, Haryana, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Rajastan, Tamil Nadu, Uttar Pradesh, and West Bengal. Punjab and Jharkhand did not have any ward-based elections and the election data are not available for Gujarat and Kerala.

changes the set of castes eligible to seek election from one term to the next within a ward. Wards are reserved for Scheduled Castes (SC), Scheduled Tribes (ST), and Other Backward Castes (OBC) in proportion to the share of these groups in the population at the district level. Among the 3,300 ward-terms in our sample, 11 percent were reserved for Scheduled Castes, 6 percent were reserved for Scheduled Tribes, and 23 percent were reserved for Other Backward Castes. The likelihood of having a dominant caste in a ward mechanically declines when it is reserved since fewer sub-castes are eligible to stand for election.

Table 2 displays the share of ward-terms in which a dominant caste was present, for alternative definitions of a dominant caste, by the type of caste reservation. The proportion of elections with a dominant caste is largest for elections that are not restricted (open), followed by elections in which the elected ward candidates are restricted to ST, OBC, and SC in that order, regardless of the population share above which a dominant is defined to be present. Matching the aggregate variation in the likelihood that a dominant caste is present across different reservation schemes in Table 2, there will be variation in the likelihood that a dominant caste is present from one term to the next *within* a ward as the type of reservation changes. Thus in our empirical analyses we can avoid biases due to cross-sectional heterogeneity by exploiting variation over time within a ward to estimate the effect of a caste equilibrium on leadership selection, competence, and commitment. Notice from Table 2 that the likelihood that a dominant caste is present varies substantially across the different thresholds ranging from 0.4 to 0.6. This variation is also useful, allowing us to later experiment with alternative thresholds to identify the share above which the caste equilibrium emerges.

Although the results in Table 2 indicate that a single caste may account for a substantial share of the ward's population in many elections, they do not tell us the threshold share above which the dominant caste can support a *caste equilibrium*. The model predicts that a caste equilibrium will emerge when the share of the dominant caste crosses a threshold somewhere below 0.5. Where this threshold actually is located depends on the strength of the relationship between the median-distance and the share of the dominant caste. Recall that the median-distance is measured as the difference between the characteristics of the median individual in the ward and in the dominant caste. When this relationship is negative and strong, the threshold will be close to 0.5.

Figure 1 plots the relationship between median-distance and the share of the dominant caste using data from the three *panchayat* terms in the wards. To avoid bias due to cross-sectional heterogeneity, we exploit variation in the type of reservation within wards. The Figure is thus constructed in two steps. In the first step, we regress median-distance on the share of the dominant caste and a full set of ward fixed effects. To allow for a nonlinear relationship between the share and the median distance, the share is constructed as a set of binary variables in 0.05 intervals over the range from 0.05 to 1. The plot in Figure 1 represents the lowess-smoothed fit to the estimated share coefficients using a bandwidth of 0.4 over the interval from 0.05 through 0.5.

As can be seen, the difference in the level of education between the median individual in the ward and the median individual in the dominant caste increases from one year to 2.5 years when we move from a share of 0.5 to a share of 0.05. The difference in the probability that the median individuals are engaged in a managerial occupation increases from 0.03 to 0.13 over the same range. Finally, the difference in the value of owned land between the two pivotal individuals increases from 40 thousand Rupees to 90 thousand Rupees over the 0.5 to 0.25 range, flattening out thereafter. There is clearly a strong negative relationship between the median distance, regardless of how it is measured, and the share of the dominant caste. A threshold of 0.5 will consequently be treated as the starting point for the empirical analysis, since we expect the true threshold to lie fairly close to that value. We will also experiment with alternative thresholds in further analyses to empirically identify the true threshold share using the discontinuities that are implied by the model.

3.2 Leadership Selection

The first prediction of the model is that the ability of the elected representative should increase discontinuously when the share of the dominant caste crosses a threshold somewhere below 0.5. Using the census and elected representative data we exploit random caste reservation in the *panchayat* elections to estimate the effect of a dominant caste on leadership selection in each ward. To measure leader ability we use three characteristics of the elected ward representatives that may be positively correlated with leadership competence - the value of land owned by the leader's household, his or her years of schooling, and whether he or she is employed in a managerial occupation that requires independent decision-making. The leadership equation is consequently specified as

$$y_{jt} = \lambda M_{jt} + f_j + \epsilon_{jt}, \tag{1}$$

where y_{jt} measures the wealth, education, or occupation of the leader selected from ward j in term t, $M_{jt} = 1$ if a dominant caste is present in the ward in that term and $M_{jt} = 0$ otherwise, f_j is a ward fixed effect and ϵ_{jt} is a mean-zero disturbance term. The model predicts that $\lambda > 0$ because more able individuals are put forward in the caste equilibrium.

This prediction of the model is based on the assumption that mean (or median) ability in the pool of potential leaders from the dominant caste does not vary with its share in the population; $E(m_c) = m$ for all shares. This allows us to interpret a positive λ estimate in the equation above as a selection effect. In practice, however, because variation in M_{jt} across terms is generated by changes in the type of reservation and because the lower castes were historically severely disadvantaged, overall caste-based disparities in wealth, education, and occupation will be correlated with the incidence of a dominant caste. That is, even if leaders are randomly selected from eligible households there may be variation in elected leader characteristics across equilibria solely because castes generally differ in wealth or skills.

Panel A of Table 3 compares the characteristics of potential leaders for open, SC, ST, and OBC elections as measured by the median characteristic of all households in each ward in each of these reservation categories. The mean (with standard deviation in parentheses) of each median characteristic is then computed across all wards. We see that there are substantial differences in median household characteristics across reservation categories. For example, eligible households in open elections have more land wealth, and heads of these households more education and experience as decision-makers, compared with eligible households in restricted elections (particularly when they are reserved for SC and ST candidates). This is because in open elections, unlike in the caste-restricted elections, upper-caste households may also put up candidates.

The panel A statistics suggest that the pool of potential leaders could vary substantially with the type of caste reservation that is in place and this could account for variation in elected leader characteristics with caste dominance even if there is no systematic leader selection. Note, however, as seen in panels B and C of Table 3 for *elected* male and female leaders respectively, that variation across elections in the mean characteristics of those who were elected is substantially smaller than the variation in average household median characteristics. This suggests that there is systematic (non-random) leader selection within election categories, although variation in the pool of leaders may still play a role in who is elected by election type. As a consequence we will include in equation (1) a full set of election reservation dummies – SC, ST, OBC, and women – as well as measures of the distribution of characteristics among the potential leaders in the ward in each term.[11]

[11]In addition, all the leadership regressions include a full set of term dummies as well as the election year, since *panchayat* elections are not synchronized across the country.

Once reservation dummies are included, identification of the effect of a caste equilibrium on leadership quality comes from the differential effect of reservation on M_{jt} across wards. This differential effect depends on the ward-specific caste distribution, which could still directly determine the quality of the leadership pool in ways not captured by the included variables measuring the distribution of potential leaders' characteristics. However, the model predicts that the competence of the leader should shift discontinuously when the share of the dominant caste crosses a particular threshold. Even if M_{jt} is correlated with the quality of the leadership pool, there is no reason why this relationship should change discontinuously at a threshold somewhere below but close to 0.5.

Table 4 reports the estimates of the leadership equation with both the basic and the augmented specification including measures of potential leaders' characteristics. These initial estimates are based on the assumption that 0.5 is the threshold population share above which a caste equilibrium is obtained. We will display estimates of λ for the full range of thresholds below. The presence of a dominant caste has a large and significant effect in Columns 1-2 on the land value of the elected representative - the elected leader's land value is almost double the average land value for elected representatives when there is a dominant caste. For this characteristic of the elected leader the reservation dummies and the distribution of potential leaders have little effect on the selected leader's characteristics, and the dominant-caste coefficient hardly changes from Column 1 to Column 2 when these additional controls are included.

The dependent variable in Columns 3-4 is a binary variable that takes the value one if the leader is employed in a managerial occupation (farm operator, businessman, or professional) and zero otherwise (technician, clerk, skilled or unskilled laborer, housewife). The presence of a dominant caste has an insignificant effect on the occupation of the leader with the basic specification and actually has the wrong sign, but a positive and statistically significant effect is obtained when we control for the changing managerial experience of potential leaders across elections. This suggests strong within-caste leader selectivity. Although the distribution of potential leaders has little direct effect on the selected leader's characteristics once again, the female and SC dummies are now negative and significant. With the appropriate candidate household controls included in Column 4, the presence of a dominant caste has a large positive effect on whether the leader has managerial experience, increasing the probability of a managerial occupation by 11 percentage points (a 16 percent increase above the mean for all representatives).

The third leader competence measure we use is the years of formal education of the elected ward representative. The presence of a dominant caste, in both the basic and the augmented specification, has no effect on the leader's education. Women and ST leaders have substantially lower schooling than the reference category, unreserved men, and an increase in schooling for the median potential leader has a significant effect on the selected leader's education. The absence of an education effect when a dominant caste is present in the ward suggests that education may not be strongly associated with leadership competence. Indeed, this variable appears to have little power in predicting competence across caste and gender lines, as we find below that elected women representatives are actually more competent than men when there is a caste equilibrium despite having substantially lower education.

The estimates in Table 4 are based on the assumption that the political regime switches when the share of the dominant caste reaches 0.5. The model, however, indicates that the regime-shift could occur somewhere below 0.5. To allow for this possibility and to identify the presence of a discontinuity, we experimented with alternative thresholds ranging from 0.2 to 0.8, for each of the leadership characteristics using the augmented specification. In the range below the true threshold, changes in the assumed threshold should have little effect on the dominant-caste coefficient. When the chosen threshold coincides with the true threshold, we expect to see a discontinuous jump upward in the dominant-caste coefficient, followed by little subsequent change in this (larger) coefficient at higher thresholds. At very high thresholds, misclassification error, with some wards in the caste equilibrium assigned to the non-caste equilibrium, could actually reduce the dominant-caste coefficient.

Figures 2 and 3 report the dominant-caste point estimates and their 95 percent confidence intervals for land values and occupation.[12] As can be seen, the dominant-caste coefficient is stable, small and marginally significant for thresholds ranging from 0.2 to 0.35 in Figure 2. There is a trend-break at that point, with the effect of a dominant caste on the land value of the leader increasing from about 50,000 Rupees at 0.35 to close to 100,000 Rupees at 0.5. Thereafter, the coefficient remains relatively stable and large before dropping steeply at 0.75. Figure 3 displays a similar pattern for managerial competence, with the dominant-caste coefficient remaining steady and low in the 0.2 to 0.4 range, before it increases steeply up to 0.6 and then remains steady once again. The presence of a dominant caste increases the probability that the leader will be employed in a managerial occupation by 5 percentage points in the 0.2 to 0.4 range, and by as much as 15 percentage points when the share is 0.6.

[12] We do not show the figure for education. The dominant-caste coefficient was imprecisely estimated with education as the dependent variable in Table 4 and so there is little reason to experiment with alternative thresholds with that variable.

Both Figure 2 and Figure 3 indicate that the shift to a new political regime occurs when the share of the dominant caste reaches 0.35 or 0.4. The discontinuity is observed despite the fact that the observed leadership characteristics are likely to be noisy measures of competence. We will observe a much sharper discontinuity, at exactly the 0.35 threshold, in our direct estimates of competence that make use of information on the actual delivery of local public goods in the next section.

3.3 Leadership Competence

The second prediction of the model is that the overall level of resources received by the ward should increase discontinuously when the share of the dominant caste reaches a threshold below 0.5, matching the prediction for leadership selection. The level of public goods received by a ward in a given term will also depend on the political equilibria in other wards, as well as the characteristics of the *panchayat* president. However, random reservation in elections across wards and for the president's position also allows us to ignore the identity of other elected representatives in the empirical analysis.[13]

According to the model the level and composition of public goods is also a function of the characteristics of the pivotal voter. We consequently estimate the determinants of local public goods delivery taking into account voter preferences and leader competence with a specification of the form

$$G_{ijt} = (\alpha_i + \delta_i X_{jt})(1 + \theta M_{jt}) + h_j + \xi_{ijt} \tag{2}$$

where G_{ijt} measures the allocation of good i in ward j in term t, X_{jt} measures the characteristics and, hence, the preferences of the pivotal household or individual in the ward-term, M_{jt} indicates the presence of a dominant caste, and ξ_{ijt} is a mean-zero disturbance term.

When $M_{ijt} = 0$, the pivotal household in the non-caste equilibrium is the median household in the ward. When $M_{ijt} = 1$ and the regime shifts to the caste equilibrium, the pivotal household becomes the median household from the dominant caste in that ward-term. Note that the first term in parentheses in equation (2) thus characterizes the (linear) demand for different types of public goods, with the α_i parameter identified off changes in the pivotal household within the ward over time. The second term in parentheses reflects the ability of the leader to raise the overall level of public goods received in the ward. Net of the ward fixed effects, h_j, the competence parameter θ and the demand parameters α_i, δ_i can be estimated using nonlinear least squares.

[13] Previous studies that focus on the role of the *panchayat* president have implicitly exploited the same randomness to ignore the role played by ward representatives in their analyses.

The prediction of the model is that $\theta > 0$, reflecting the selection of more competent individuals in the caste equilibrium. Because variation in M_{jt} within a ward is generated by changes in caste reservation across terms, an alternative explanation for a positive θ estimate is that $M_{jt} = 0$ is disproportionately associated with less competent lower-caste leaders. We dealt with the same concern in the leadership regression and our solution to the problem was to include a full set of reservation dummies. Because M_{jt} enters multiplicatively in equation (2) above, the corresponding augmented specification allows competence to vary by the type of reservation:

$$G_{ijt} = \sum_{r=1}^{R} \left[w_{1r}(\alpha_i + \delta_i X_{jt}) + w_{2r}\theta M_{jt}(\alpha_i + \delta_i X_{jt}) \right] + k_j + \zeta_{ijt}, \tag{3}$$

where w_{1r}, w_{2r} estimate the effect of reservation, separately in the non-caste and caste equilibrium, on overall resources. The reservation categories include SC, ST, OBC, and women, with unreserved men occupying the reference category.

The flexible specification in equation (3) controls for differences in competence across castes that could be correlated with M_{jt}. However, we are still identified off the differential effect of reservation on M_{jt} across wards. As with the leadership regression, we will also rely on the discontinuity implied by the model, at a threshold somewhere below 0.5, to rule out alternative explanations for the effect of M_{jt} on public good provision.

G_{ijt} is measured as the share of households in the ward who received a particular good i in a given *panchayat* term, where public good provision is defined to include both new construction and maintenance. The share of households in a ward in each term that benefited from a specific public good was constructed by matching the locations of households and goods, based on the street location of each public goods investment and the street addresses of the households. Our analysis focuses on six goods for which the benefits have a significant local and spatial component; that is, goods for which attachment or proximity to the household is desirable. The goods are: drinking water, sanitation, improved roads, electricity, street lights, and telephone kiosks.[14] These six goods account for 15.2 percent of all local public spending, which is four times the amount spent on schools and health facilities.[15]

[14] Public irrigation investments or school buildings, for example, are desirable local public goods whose placement close to a ward resident, or even within the ward (defined by place of residence) may not be desirable.

[15] Key informants in the village were asked to rank 12 issues, by importance, that came under the purview of the elected *panchayat*. Inadequate roads and drinking water were ranked 1 and 2, followed by health, schooling, sanitation, street lights and electrification.

Table 5 reports the shares by public good and election type. Evidently, a large fraction of households benefited directly from expenditures on water, roads, and sanitation, while a much smaller fraction benefited in any term from expenditures on electricity, street lights, and a telephone kiosk. Notice, in contrast with the leadership characteristics in Table 3, that public good provision does not appear to vary systematically across castes, or between open and reserved elections in Table 5.

Table 6 reports the estimates of the public goods delivery equation, with the public goods demand parameters reported in Table 6(a) and the competence parameters in Table 6(b). The first three columns of each table report estimates from the basic specification, measuring the pivotal voter's characteristics sequentially by owned land value, occupation, and education. The next three columns of each table report estimates from the augmented specification allowing competence to vary by gender and caste, with the same sequence of median voter characteristics.

The public good demand estimates in Table 6(a) are precisely estimated, with the intercepts α_i matching the pattern of public good provision in Table 5. Recall that a relatively large fraction of households benefited from expenditures on water, sanitation, and roads in each ward-term. The provision/maintenance of a telephone kiosk is the reference category in Table 6(a), and we see that the drinking water, sanitation, and roads intercepts are also relatively large in magnitude and very precisely estimated.

While the intercept reflects the mean level of provision of a given public good, we are also interested in the role played by the pivotal individual in the ward on the distribution of resources across public goods. In our model the pivotal voter plays a key role, but the identity of that voter is different depending on whether there is a caste equilibrium. In particular, the median individual in the ward (caste) is pivotal when a dominant caste is absent (present). In the data, there is variation in the identity of the pivotal individual within the ward across *panchayat* terms due to the randomly changing caste-based leadership reservations. We are thus able to identify, while including ward fixed effects, the impact of pivotal voter characteristics on the demand for public goods.

The characteristics of the pivotal household have a significant effect on the allocation of public goods in the ward in Table 6(a). Relative to public telephone investment (the reference category), an increase in the value of the pivotal individual's landholdings increases the allocation of resources to roads and reduces the allocation to electricity. When the pivotal individual (household head) is employed in a managerial occupation, we see a relative increase in the resources allocated to electricity and street lights. The education of the pivotal individual, in contrast, does not significantly affect the allocation to any single good. Nevertheless, we can reject the joint hypothesis that the pivotal characteristic has no effect on the distribution of public goods with 95 percent confidence for land value, occupation, and education.

The results in Table 6(a) indicate that elected ward representatives are responsive to the preferences of the pivotal individuals in their constituencies. Postponing a formal test of leadership commitment to the next section, we turn next to tests of leadership competence. The competence parameter θ in Table 6(b) is positive and significant across both specification and for all measures of the pivotal voter's characteristics, ranging in magnitude from 0.13 to 0.20. The presence of a dominant caste in the ward thus appears to increase the overall level of local public resources the ward receives, with respect to this set of local public goods, by about 16 percent.

The augmented specification in Columns 4-6 allows competence to vary by caste and gender. Although some of the caste coefficients are individually significant, we cannot reject the hypothesis that all the caste coefficients, uninteracted and interacted with θ as in equation (3), are jointly zero. While a woman leader in the non-caste equilibrium is statistically indistinguishable from the reference category (unreserved men), it is interesting to note that elected women are more competent than elected male representatives when there is a caste equilibrium (when competence is more likely to matter for election outcomes). Female representatives evidently raise the overall level of resources by 10 percent compared to men who are elected in the same equilibrium.

We complete the analysis of leadership competence by estimating θ for different thresholds defining whether there is a dominant caste. Recall that the estimated θ coefficient should remain small and steady as we increase the threshold share until the chosen threshold coincides with the true threshold. At that point, there should be a steep increase, after which the θ estimate should again remain steady at the larger level for higher thresholds.

Figure 4 reports the pattern of estimated θs and the accompanying 95 percent confidence bands using land value as the pivotal characteristic. There is a steep increase in the θ coefficient when the threshold reaches 0.35 and a flattening out after 0.6. Indeed, the θ coefficient increases threefold, from 0.05 to 0.15, over the cutoff interval 0.35 - 0.6. Figures 5 and 6 repeat this exercise with occupation and education, respectively, as the pivotal characteristics. Once again, we see a steep increase in the θ estimate, from 0.05 to over 0.15, in the 0.35 to 0.5 cutoff interval, with no change in the coefficient thereafter. The estimated pattern of coefficients and the points of discontinuity match well with the leadership selection patterns in Figures 2-3. The similarity in the estimated threshold discontinuity for both measured leader characteristics and the direct competence measure based on overall public goods delivery, at a share just below 0.5, provides strong support for the hypothesis that the political regime is switching at that point.

3.4 Leadership Commitment

The model predicts that the leader in the caste equilibrium will choose projects that are aligned with the preferences of the median individual in the dominant caste, regardless of his own preferences. In contrast, the median individual in the ward, who is selected as the leader, will choose his or her preferred mix of projects in the non-caste equilibrium.

To test these predictions, we take advantage of an additional feature of the randomized reservation in Indian local governments, which is that a reservation for female ward representatives is overlayed on caste reservation. In particular, one third of all seats are randomly restricted to female leaders and this reservation is applied equally across caste and open seats in each *panchayat* election. It is generally believed that male and female preferences for public and private goods differ, with a voluminous literature on intra-household resource allocations providing empirical evidence on this claim. Within a ward, for a given type of caste reservation (or open election), the share of the dominant caste and, hence, the political equilibrium, will be the same across *panchayat* terms whether or not the seat is reserved for a woman. If the ward representative's position is reserved for a woman in one of those terms, the allocation of public goods can be compared across male and female leaders to test the commitment hypothesis: that in a caste equilibrium variation in leader characteristics does not affect the distribution of public goods.

Given the problem of commitment, in the non-caste equilibrium we would also expect *elected* male and female leaders to have relatively similar preferences (close to the median preference in the ward). However, if the male and female preference distributions have little overlap, the allocation of resources could vary with the gender of the leader, as found by Chattopadhyay and Duflo (2004). The strong prediction of our model is that even in such cases differences in public goods allocations by gender should never be observed in the caste equilibrium.

To test these predictions, we estimate a modified version of the public goods allocation equation. In particular, we now include ward-reservation fixed effects. We are thus identifying the role of the gender of the elected representative in delivering public goods for each equilibrium type controlling for all (observable and unobservable) aspects of voters and potential leaders in the ward:

$$G_{ijtr} = \eta_i + \pi_i W_{jtr} + \tilde{k}_{jr} + \xi_{ijtr} \tag{4}$$

where G_{ijtr} measures the share of households in ward j that received good i in term t when reservation r was in place. W_{jtr} is a binary variable that takes the value one if the position was reserved for a female leader in that ward-term, $\tilde{k}_{jr}$ is a ward-reservation fixed effect, and ξ_{ijtr} is a mean-zero disturbance term. The reservation categories are SC, ST, OBC, and Open. The regression is estimated separately for $M_{jt} = 0$ and $M_{jt} = 1$, and the prediction is that π_i should be zero for all public goods i when $M_{jt} = 1$. The female coefficient could be significant when $M_{jt} = 0$ if the male and female preference distributions are sufficiently far apart, as discussed above.

Table 7 reports the estimates of equation (4) with ward-reservation fixed effects, separately for $M_{jt} = 0$ and $M_{jt} = 1$. We consider three thresholds above which a dominant caste is assumed to be present: 0.4, 0.5, 0.6. In the non-caste equilibrium ($M_{jt} = 0$), the woman representative coefficient is always positive and significant for street lights, increasing the share of households that receive that good by 0.07 relative to the reference good (public telephone). The woman-leader coefficient is also positive and significant for electricity, with the threshold set at 0.4, but loses significance at higher thresholds. In contrast to the estimates for the non-caste equilibrium, the elected woman-representative coefficient is *never* significant in the caste equilibrium ($M_{jt} = 1$) for any public good or jointly for all public goods. Thus, while the presence of a female leader does appear to change the mix of goods (the allocations are relative to the reference good) in the non-caste equilibrium, we cannot reject the commitment hypothesis in the caste equilibrium.[16]

4 Conclusion

This paper proposes a novel explanation for the emergence and persistence of parochial politics, based on the idea that strong social institutions can discipline the leaders they put forward, successfully substituting for secular political institutions when they are ineffective. Using unique data on Indian local governments at the ward level over multiple terms, and exploiting the randomized election reservation system, we find that the presence of a numerically dominant sub-caste (caste equilibrium)

[16] We cannot reject the hypothesis that all the female coefficients are zero in the non-caste equilibrium as well, but notice that the p-values for the test range from 0.6 to 0.85 for $M_{jt} = 1$ but are as low as 0.14 for $M_{jt} = 0$. Our inability to reject the null hypothesis in the non-caste equilibrium might simply be a consequence of the low power of our statistical test. Note again that we are only identified off variation in the gender of the leader within wards *and* reservation categories.

is associated with the selection of leaders with superior observed characteristics and by greater public goods provision. This improvement in leadership competence occurs without apparently diminishing leaders' responsiveness to their constituency.

While these results are promising, they need to be placed in the appropriate perspective. The leader in a caste equilibrium is answerable to the social group he belongs to and so his choices will be aligned with the preferences of the median voter in the dominant caste rather than the median voter in the constituency. When the dominant caste covers almost the entire population of the constituency, the discrepancy between the two pivotal voters and, hence, welfare costs are small. As the share of the dominant caste declines, however, the welfare cost associated with a caste equilibrium could increase and our data suggest that it does. Caste politics is a second-best solution and, ultimately, there is no perfect substitute for well functioning political institutions (parties) in a competitive democratic system.

While the sub-caste may be able to control the leaders it nominates at the local (village) level, it will have less influence at higher levels of government where a single sub-caste is rarely dominant. The negative effect of caste-identity politics on leadership selection and outcomes has been documented at the state level in India and similar negative outcomes have been associated with parochial politics in other parts of the world. To assess whether parochial politics is efficiency enhancing, a systematic investigation of the relationship between social institutions and the economic and political systems with which they interface is required.

Finally, our results shed new light on the efficiency consequences of political reservation in India. Randomly assigned caste reservation mechanically increases the commitment problem by inducing exogenous turnover in the leadership. At the same time, reservation reduces the likelihood that a caste equilibrium with a numerically dominant caste will emerge in any constituency, exacerbating the commitment problem. In addition to worsening the commitment problem, the current system of sequential reservation results in less experienced and less competent leaders. It is tempting to infer that efficiency costs will be small if all constituencies are affected in this way and the overall resources available at each level of the political system is fixed. However, to the extent that leadership characteristics are complementary, a superior pool of leaders could have additional aggregate impacts on the economy and the polity that are substantial.

The obvious equity advantage of any reservation system is that it favors historically-disadvantaged groups. Under the current system, the effect of reservation is not only to change the identity of the leader but also to change the probability that a caste equilibrium with a competent leader will emerge in the constituency. This last probability depends on the distribution of sub-castes in the constituency, complicating any assessment of the impact of caste reservation on efficiency or equity. The multiple sources of inefficiency that we identify in this paper suggests that a systematic appraisal of the costs and the benefits of political reservation in India may be warranted. One notable exception to this qualified assessment of the reservation system is quotas for women. This particular reservation scheme does not adversely affect the probability that a caste equilibrium will emerge and we see that women leaders are significantly more competent than men in that equilibrium.

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Table 1: Sources of Support for Ward Leaders

Source of support:	within village	outside village
	(1)	(2)
From caste	82	29
From religion	28	13
From wealthy individuals	38	--
From a political party	--	41

Note: The statistics are computed over the last three local governments in each ward.
Each statistic reflects the percent of leaders who received support from a given source.

Table 2: Share of Wards with a Dominant Caste

Type of election:	Open	SC	ST	OBC
	(1)	(2)	(3)	(4)
Threshold for dominance:				
0.4	0.79	0.46	0.61	0.53
	(0.40)	(0.50)	(0.49)	(0.50)
0.5	0.67	0.37	0.52	0.44
	(0.47)	(0.48)	(0.50)	(0.50)
0.6	0.49	0.29	0.49	0.32
	(0.50)	(0.45)	(0.50)	(0.47)
Total number of observations	1,973	373	187	769

Note: a caste is defined to be dominant if its share of the population in the ward exceeds the threshold.
SC=scheduled caste, ST=scheduled tribe, OBC=other backward caste.
Information on reservation and election outcomes is obtained for three terms in each ward.
Standard deviations in parentheses.

Table 3: Pivotal Voter and Leader Characteristics

Election type:	Unreserved	SC	ST	OBC
	(1)	(2)	(3)	(4)
Panel A: Median individuals				
Land value	94.80	47.35	63.35	94.76
	(173.19)	(105.85)	(182.02)	(157.49)
Decision-making occupation	0.36	0.18	0.33	0.39
	(0.47)	(0.37)	(0.46)	(0.49)
Education	4.46	3.53	3.30	4.03
	(3.76)	(3.59)	(3.65)	(3.36)
Panel B: Male leaders				
Land value	99.55	81.50	58.36	83.21
	(23.69)	(20.16)	(19.91)	(15.23)
Decision-making occupation	0.80	0.44	0.72	0.76
	(0.40)	(0.50)	(0.45)	(0.43)
Education	7.42	6.01	5.30	7.05
	(4.43)	(4.49)	(3.99)	(4.30)
Panel C: Female leaders				
Land value	95.61	43.01	31.50	62.44
	(30.23)	(10.10)	(40.86)	(91.83)
Decision-making occupation	0.17	0.29	0.33	0.57
	(0.38)	(0.46)	(0.49)	(0.50)
Education	3.23	5.78	2.22	4.72
	(3.83)	(4.39)	(2.05)	(4.17)

Note: all characteristics in Panel A are measured as the median value in the ward for the relevant caste category.
The means (standard deviations) of these characteristics across all wards are reported in the table.
Leaders' occupation and education is obtained for last three terms in each ward.
Information on land value is based on all candidates in the ward over the last two terms. .
Information on the landholdings of elected representatives was not collected
Land value is measured in thousands of Rupees.
Decision-making occupation is a binary variable.
This variable takes the value one for professional occupations, business and farming and zero for
agricultural labor, skilled labor, unskilled labor, technicians, and housewife.
Education is measured as years of schooling.
SC=scheduled caste, ST=scheduled tribe, OBC=other backward caste.

Table 4: Leadership Selection Estimates

Dependent variable:	leader's characteristics					
Characteristics measured by:	land value		decision-making occupation		education	
	(1)	(2)	(3)	(4)	(5)	(6)
Dominant caste	87.04	86.69	-0.01	0.11	-0.52	0.35
	(37.77)	(39.11)	(0.05)	(0.05)	(0.40)	(0.43)
Female reservation	--	-9.88	--	-0.57	--	-3.77
		(11.39)		(0.02)		(0.22)
SC reservation	--	2.34	--	-0.15	--	-0.30
		(21.20)		(0.04)		(0.41)
ST reservation	--	-2.94	--	-0.05	--	-1.43
		(12.30)		(0.06)		(0.48)
OBC reservation	--	-16.94	--	-0.01	--	0.07
		(16.30)		(0.03)		(0.27)
0.25 quantile of potential-leader distribution	--	0.27	--	0.030	--	-0.19
		(0.14)		(0.05)		(0.10)
0.50 quantile of potential-leader distribution	--	-0.09	--	0.08	--	0.20
		(0.13)		(0.11)		(0.10)
0.75 quantile of potential-leader distribution	--	-0.04	--	-0.07	--	-0.08
		(0.08)		(0.25)		(0.09)
Ward fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.17	0.16	0.16	0.43	0.16	0.30
Number of observations	2,604	2,604	3,279	3,279	3,257	3,257

Standard errors in parentheses are robust to heteroscedasticity and clustered residuals within each ward-term.
All regressions include term dummies and the election year.
Dominant caste is a binary variable that takes the value one if the share of the most numerous caste in the ward exceeds 0.5, zero otherwise.
Land value is measured in thousands of Rupees.
Decision-making occupation is a binary variable. See table 3.
This variable takes the value one for professional occupations and farming, zero for agricultural labor, husewife.
Education is measured as years of schooling.
SC=scheduled caste, ST=scheduled tribe, OBC=other backward caste.
Leaders' occupation and education is obtained for last three terms in each ward.
Information on land value is based on all candidates in the ward over the last two terms.

Table 5: Share of Households in the Ward Receiving Public Goods in each Term

Type of election:	Open	SC	ST	OBC
	(1)	(2)	(3)	(4)
water	0.69	0.73	0.78	0.72
	(0.40)	(0.39)	(0.71)	(0.39)
sanitation	0.42	0.42	0.55	0.42
	(0.46)	(0.46)	(0.47)	(0.46)
roads	0.69	0.72	0.74	0.73
	(0.41)	(0.40)	(0.41)	(0.39)
telephones	0.07	0.12	0.08	0.10
	(0.24)	(0.30)	(0.25)	(0.28)
electricity	0.14	0.20	0.17	0.20
	(0.34)	(0.38)	(0.36)	(0.38)
street lighting	0.16	0.19	0.19	0.22
	(0.36)	(0.38)	(0.39)	(0.40)
Number of observations	1,704	373	176	619

Note: means and standard deviations (in parentheses).
SC=scheduled caste, ST=scheduled tribe, OBC=other backward caste.
Statistics are based on the last three terms in each ward.

Table 6(a): Public Goods Demand Parameters

Dependent variable:	public good provision					
Specification:	no reservation interactions			reservation interactions		
Pivotal characteristic:	land value	managerial occupation	education	land value	managerial occupation	education
	(1)	(2)	(3)	(4)	(5)	(6)
Water intercept	0.57	0.58	0.55	0.54	0.54	0.51
	(0.02)	(0.04)	(0.02)	(0.02)	(0.04)	(0.03)
Sanitation intercept	0.31	0.34	0.31	0.29	0.32	0.28
	(0.02)	(0.04)	(0.02)	(0.02)	(0.04)	(0.02)
Roads intercept	0.54	0.57	0.56	0.51	0.53	0.53
	(0.02)	(0.04)	(0.02)	(0.02)	(0.04)	(0.03)
Electricity intercept	0.09	-0.03	0.08	0.08	-0.03	0.07
	(0.01)	(0.03)	(0.01)	(0.01)	(0.03)	(0.01)
Street lights intercept	0.09	-0.03	0.09	0.08	-0.03	0.08
	(0.01)	(0.03)	(0.01)	(0.01)	(0.03)	(0.01)
Pivotal char. - water	5.76	-0.02	2.82	5.57	-0.02	3.67
	(4.43)	(0.04)	(3.31)	(4.26)	(0.04)	(3.20)
Pivotal char. - sanitation	2.20	-0.04	-1.05	2.07	-0.04	-0.24
	(4.85)	(0.04)	(3.49)	(4.58)	(0.04)	(3.33)
Pivotal char. - roads	24.50	-0.005	-1.22	23.60	-0.004	-0.01
	(5.47)	(0.04)	(3.55)	(5.22)	(0.04)	(3.40)
Pivotal char. - electricity	-17.70	0.10	-4.44	-16.50	0.09	-3.64
	(3.21)	(0.03)	(2.62)	(3.04)	(0.03)	(2.49)
Pivotal char. - street lights	-6.44	0.12	-3.19	-5.87	0.11	-2.37
	(3.50)	(0.03)	(2.65)	(3.28)	(0.03)	(2.51)
Ward fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.37	0.36	0.36	0.37	0.36	0.36
all pivotal char.-goods=0						
(F-statistic)	17.00	10.68	2.32	14.62	12.99	2.49
(p value)	0.00	0.00	0.04	0.00	0.00	0.03
Number of observations	14,270	14,215	14,255	14,270	14,215	14,255

Standard errors in parentheses are robust to heteroscedasticity and clustered residuals within each ward-term.

The dependent variable is computed as the share of the households in the ward who received a given public good in a given term. Public telephone (kiosk) is the excluded local public good.

The pivotal characteristic is the median in the ward (dominant caste) when a dominant caste is absent (present).

Land value is measured in thousands of Rupees. Coefficients on land value-goods in Columns 1 and 4 must be divided by 10^5.

Managerial occupation takes the value one for professional occupations and farming, zero for agricultural labor, housewife.

Education is measured as years of schooling. Coefficient on education-goods in Columns 3 and 6 must be divided by 10^3.

All regressions include term dummies and the election year.

Table 6(b): Leadership Competence Parameters

Dependent variable:	public good provision					
Specification:	no reservation interactions			reservation interactions		
Pivotal characteristic:	land value	managerial occupation	education	land value	managerial occupation	education
	(1)	(2)	(3)	(4)	(5)	(6)
Theta	0.13	0.16	0.17	0.15	0.20	0.19
	(0.03)	(0.03)	(0.03)	(0.05)	(0.05)	(0.05)
SC	--	--	--	0.08	0.12	0.12
				(0.05)	(0.05)	(0.05)
ST	--	--	--	0.09	0.11	0.13
				(0.07)	(0.08)	(0.08)
OBC	--	--	--	0.09	0.09	0.08
				(0.05)	(0.05)	(0.05)
Woman	--	--	--	-0.02	-0.001	-0.02
				(0.04)	(0.04)	(0.04)
SC x Theta	--	--	--	-0.02	-0.09	-0.04
				(0.08)	(0.08)	(0.08)
ST x Theta	--	--	--	0.09	0.04	0.02
				(0.10)	(0.10)	(0.10)
OBC x Theta	--	--	--	-0.05	-0.05	-0.04
				(0.06)	(0.06)	(0.06)
Woman x Theta	--	--	--	0.10	0.08	0.10
				(0.05)	(0.05)	(0.05)
Ward fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
all caste dummies=0						
(F-statistic)	--	--	--	0.79	1.57	1.93
(p value)				0.50	0.19	0.12
all caste dummies-dominant caste=0						
(F-statistic)	--	--	--	0.53	0.23	0.38
(p value)				0.66	0.88	0.77
R^2	0.37	0.36	0.36	0.37	0.36	0.36
Number of observations	14,270	14,215	14,255	14,270	14,215	14,255

Standard errors in parentheses are robust to heteroscedasticity and clustered residuals within each ward-term.
The dependent variable is computed as the share of the households in the ward who received a given good in a given term:
clean water(1), sanitation(2), improved roads(3), electricity(4), street lights(5). Public telephone kiosk is the excluded category.
The pivotal characteristic is the median in the ward (dominant caste) when a dominant caste is absent (present).
Land value is measured in thousands of Rupees.
Managerial occupation takes the value one for professional occupations, business and farming, zero for unskilled labor, skilled labor, technician, clerical and housewife.
Education is measured as years of schooling.
Reservation categories are SC, ST, OBC, and woman.
All regressions include term dummies and the election year.

Table 7: Commitment Estimates

Dependent variable:	public good provision					
Threshold for dominance:	0.4		0.5		0.6	
	(1)	(2)	(3)	(4)	(5)	(6)
Woman - water	-0.02	0.012	-0.006	0.007	0.004	0.003
	(0.028)	(0.019)	(0.024)	(0.020)	(0.021)	(0.024)
Woman - sanitation	0.004	0.014	-0.008	0.020	0.001	0.015
	(0.033)	(0.020)	(0.027)	(0.022)	(0.023)	(0.026)
Woman - roads	-0.020	0.025	-0.034	0.038	0.002	0.027
	(0.034)	(0.020)	(0.024)	(0.022)	(0.024)	(0.025)
Woman - electricity	0.063	-0.005	0.034	-0.002	0.029	-0.017
	(0.030)	(0.015)	(0.024)	(0.016)	(0.019)	(0.018)
Woman - street lights	0.067	-0.006	0.059	-0.009	0.056	-0.029
	(0.030)	(0.016)	(0.024)	(0.017)	(0.020)	(0.019)
Ward - reservation fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Dominant caste in the ward	No	Yes	No	Yes	No	Yes
All woman-goods=0						
(F-statistic)	1.65	0.40	1.41	0.73	1.64	0.74
(p value)	0.14	0.85	0.22	0.60	0.15	0.59
R^2	0.41	0.44	0.41	0.45	0.41	0.46
Number of observations	4,575	9,670	6,020	8,225	8,010	6,235

Standard errors in parentheses are robust to heteroscedasticity and clustered residuals within each ward-term.

The dependent variable is computed as the share of households in the ward who received a given good in a given term.

Public telephone kiosk is the excluded good.

Woman dummy equals one if the leader is a woman, zero otherwise.

A dominant caste is assumed to be present if the share of the most numerous caste in the ward exceeds the threshold.

Reservation includes SC=scheduled caste, ST=scheduled tribe, OBC=other backward caste, and Open.

All regressions include term dummies, the election year, and a full set of public good dummies.

Figure 1: Median Distance by the Share of the Dominant Caste in the Ward

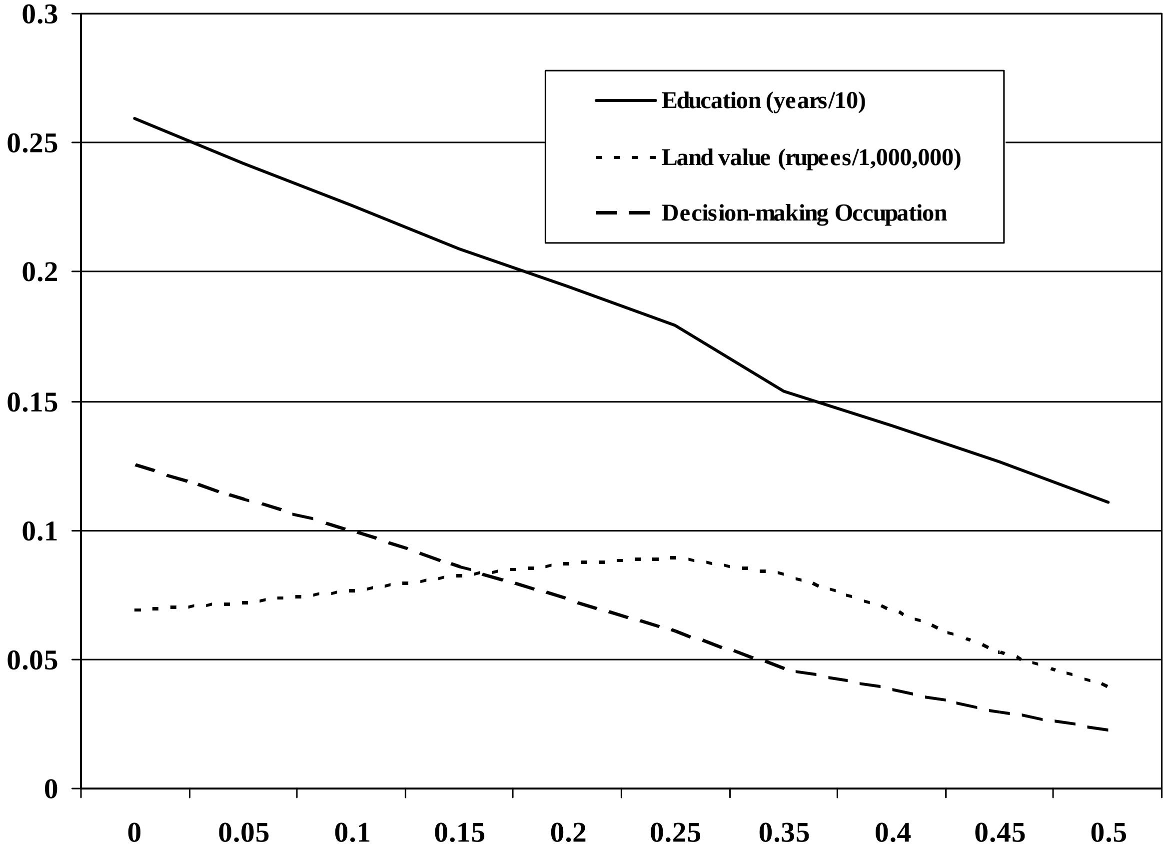

Figure 2: Estimated Effect , with 95% Confidence Bounds, of a Dominant Caste on the Landholding Value (1,000's rupees) of the Ward Representative, By Share Threshold

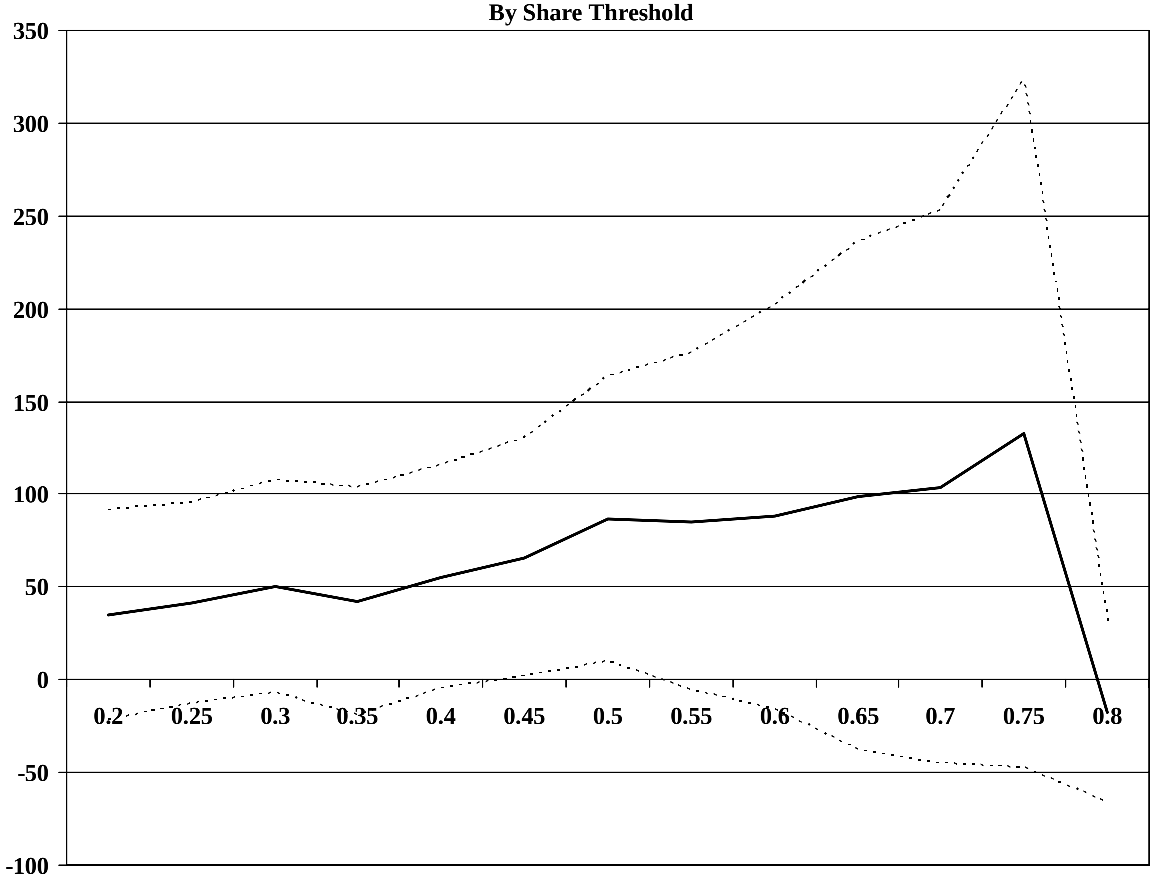

Figure 3: Estimated Effect, with 95% Confidence Bounds, of a Dominant Caste on Whether the Ward Representative is a Decision-Maker, By Share Threshold

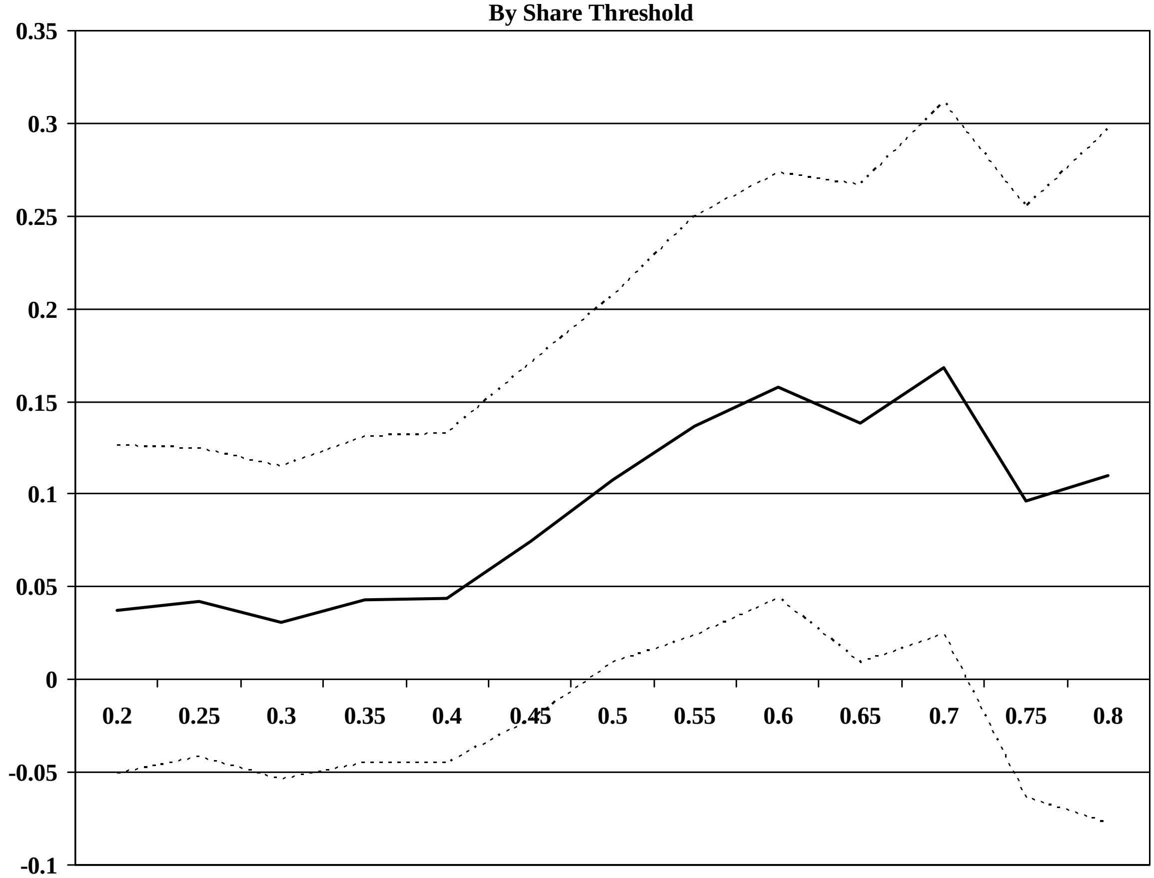

Figure 4: Estimated Competence Coefficient, with 95% Confidence Bounds, By Share Threshold (Land Wealth)

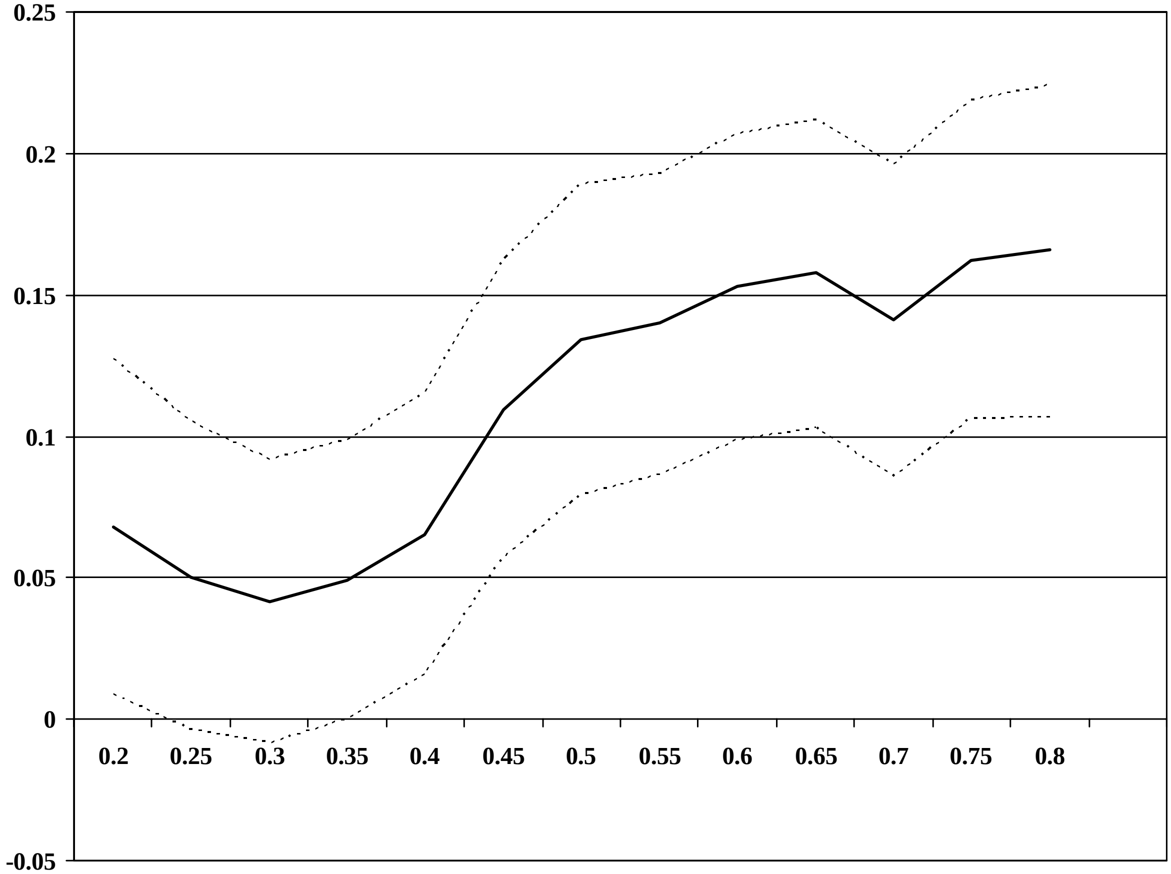

Figure 5: Estimated Competence Coefficient, with 95% Confidence Bounds, By Share Threshold (Occupation)

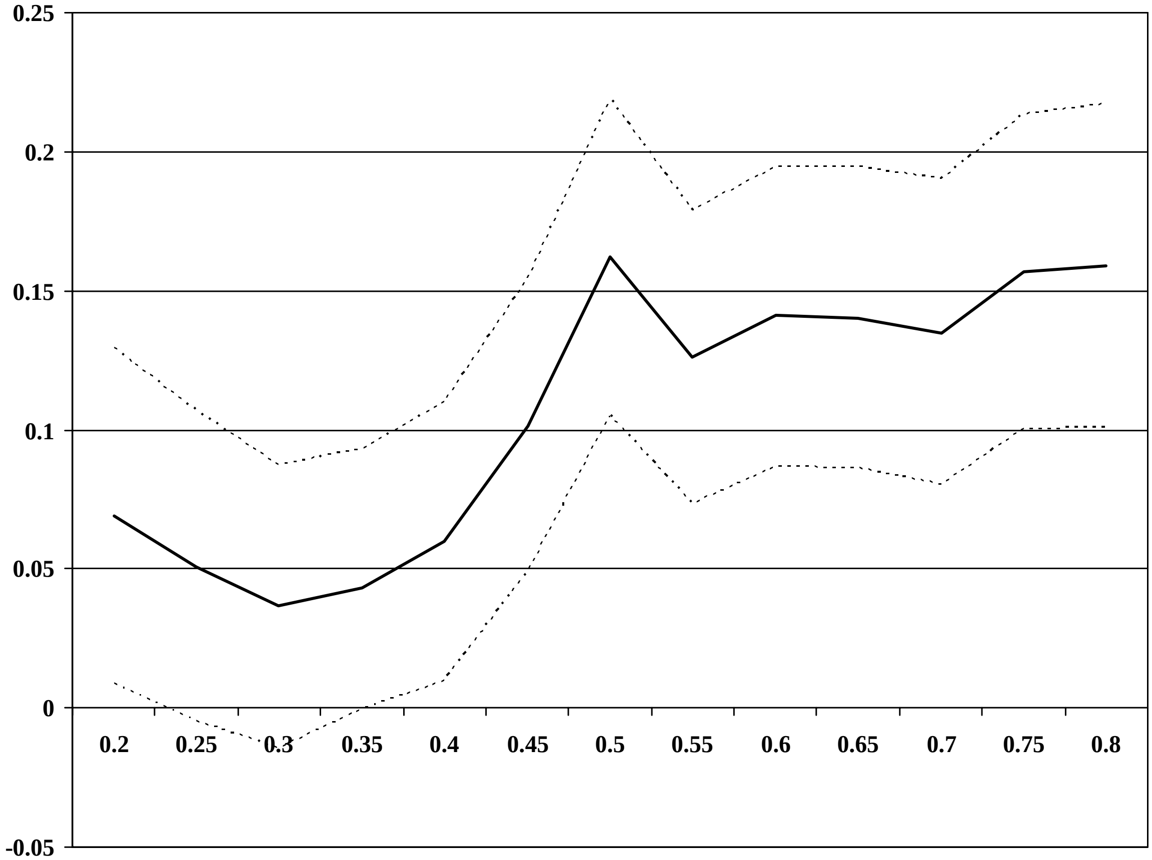

**Figure 6: Estimated Competence Coefficient, with 95% Confidence Bounds,
By Share Threshold (Education)**