Two Commitment Problems Are Better than One: Credit and Local Politics in Rural India*

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Abstract

Drawing together literature on credit market failure and political commitment, this paper proposes a new channel by which a politician may intervene in the credit market without pressuring banks to increase or redirect lending. Instead, the politician can make a constituent into a more attractive credit risk by making her receipt of private government aid conditional on her loan repayment; much like collateral, this allows the constituent to credibly commit to repaying her loan. However, the politician's offer to deliver benefits is itself only credible if the politician values the constituent's support. I provide evidence of this interaction with novel data from a survey of microcredit groups in South India. Using measures of the constituent's valuation of two forms of government aid and exogenous variation in the probability that the local politician is eligible for reelection, I show that a constituent with high aid valuation receives more aid, spends more time supporting the politician and his political allies, and receives more credit than a constituent with low valuation, but only when the politician is likely to be eligible for reelection. This analysis underscores the importance of local politicians as brokers, which may be very relevant in many contexts across both rich and poor countries.

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1 Introduction

The literature on political involvement in the credit market has so far concentrated on the division between three broad theories: the social view, the agency view, and the political view (Coleman 2011, Sapienza 2004). In the social view, governments can increase social welfare by forcing banks to make loans that are unprofitable but socially beneficial (Stiglitz 1993); the agency view complicates this by positing that government involvement produces weak managerial incentives that decrease the internal efficiency of banks (Tirole 1994). The political view, however, is that the government enables politicians to use their power over lending strategically, either to win reelection, increase campaign contributions, or otherwise reward favored individuals, creating inefficiencies in the credit market without any societal benefit (Shleifer and Vishny 1994).

These views differ on the motivation for political involvement in credit markets and on its social desirability, but all three share the common assumption that this involvement comes in the form of an implicit or explicit directive on lending issued by the politician, and therefore must have an adverse effect on the bank (as it would not choose to make the loan otherwise). There is a body of work that uses this assumption to test the political view by measuring how variations in political incentives affects credit outcomes; for instance, studies that show that lending increases in close elections (Coleman 2011, Cole 2009, Carvalho 2010). While that direct channel is present and relevant in many contexts, in this paper I show the existence of an alternate channel. Instead of forcing the banks the lend, the politician may increase lending by giving his constituents a way to credibly commit to repayment by using using the cooperative nature of the politician-constituent relationship as a kind of collateral. This could make bank, constituent, and politician better off by solving an underlying credit market failure while increasing the support received by the politician.

This idea is adapted from the literature on microcredit lending, and how it may exploit social capital to overcome credit market failures. Stiglitz and Weiss (1981) gives the canonical explanation of how credit market failure can affect poor borrowers: without collateral, there is no way to deter strategic default or to distinguish good credit risks from bad credit risks, potentially causing the entire market to unravel. Using this framework, Ghatak (1999) and Besley and Coate (1995) show that the joint-liability contract[1] typically used by microlenders can overcome these issues by harnessing the 'social capital' of the borrowing group. In particular, Besley and Coate (1995) shows how group members may be deterred from strategic default by the threat of social sanctions from other group members; in essence, the group's creditworthiness increases because of the ability of the group to revert from a mutually-beneficial cooperative outcome to a

[1] In a standard joint-liability contract, members of a joint-liability group take out loans individually from a bank, but default by any member results in the entire group of borrowers being cut off from future loans.

suboptimal uncooperative outcome. The 'social capital' that is used as 'collateral' is the surplus value derived from cooperation.

Just as two members of the same group enjoy a cooperation surplus, so too can the politician and the constituent: the politician depends upon constituents for reelection, while constituents depend upon politicians for the provision of government-supplied public and private goods. Cooperation between the two results in the reelection of the politician and the provision of these government resources to the constituent. In the proper institutional context, there is no reason why the politician-constituent cooperation surplus could not be used as 'collateral' in the same manner as the intragroup cooperation surplus, under the condition that politician and constituent both enjoy a sufficient surplus from cooperation.

This formulation of the politician-constituent relationship builds on previous developments in political economy. There is a substantial literature on the problem of commitment that exists between the politician and the constituent, much of it set in the citizen-candidate framework of Besley and Coate (1997), in which politicians are incapable of commitment and thus candidates with preferences that match those of the median voter will be selected. One arm considers how the preferences of individual candidates affect policy decisions: Chattopadhyay and Duflo (2004) presents convincing evidence that female local politicians in India provide a mix of public goods preferred by women in their state, and Washington (2008) shows that United States congressmen vote differently on women's issues depending on whether or not they have a daughter. Another arm of this literature shows how institutions can allow politicians to credibly commit to policies that do not match their personal preferences; Alesina and Spear (1988) and Harrington (1992) suggest that strong political parties can play this role, while Munshi and Rosenzweig (2010) give evidence that, in contexts with weak political parties, extended kinship networks can be the vehicle for commitment.

This paper fits into a third arm of the literature, dealing with how politicians respond to incentives created by their repeated interaction with constituents. Besley and Case (2003) provide a thorough overview of the effects of term limits in the United States, with evidence that term limits affect the behavior of governors (Besley and Case 1995, List and Sturm 2006) and members of Congress (McArthur and Marks 1988). Two papers in the Brazilian context give particularly interesting evidence: Ferraz and Finan (2009a) show that mayors who are eligible for reelection (or who later run for higher office) are significantly less corrupt than those who are term-limited, and Ferraz and Finan (2009b) show that increasing the wages of municipal legislators leads to greater effort and greater provision of certain public goods; they also provide suggestive evidence that this is due to changes in the behavior of legislators in office as well as attracting more talented individuals to run for office.

I contribute to this literature by incorporating the incentives of constituents as well as those of politicians: just as the constituents can discipline the politician by controlling his ability to

be reelected, so too can the politician discipline his constituents by controlling their access to government aid. This two-sided relationship potentially allows the politician to help his constituents both directly, by providing aid, and indirectly, by acting as a credible broker between constituents and third parties such as banks.

This paper was inspired by discussions with the leaders of an organization that sponsors and trains microcredit groups in Tamil Nadu, India. They expressed a desire to help their groups become involved with local electoral politics, despite the lack of formal connection between the powers and responsibilities of the local politicians and the interests of the microcredit borrowers. Results from preliminary data showed that these politicians did somehow affect credit provision; this was puzzling since, again, these politicians do not seem to have any formal power in that regard. This suggested that politicians might be inducing lending in an indirect manner, which shaped my survey instrument and led to the development of my model.

I test my theory using novel data from a survey of microcredit groups in an administrative block of Tamil Nadu, India. Due to the government's policy of reserving certain constituencies for members of historically "low" castes, local politicians face semi-random term limits. This creates an exogenous source of variation in the constituent's ability to discipline the politician. The government anti-poverty programs examined provide money and materials for upgrading thatch-roof huts into cement houses in one case and guarantee employment for rural households in another case; these have greater value for certain constituents, based on the condition of their housing and the demographic make-up of their households respectively. Section 2 provides background on these institutions.

Section 3 presents a simple model of lending and patronage as an infinitely-repeated two-step game between constituent, bank, and politician. The constituent would benefit from a bank loan, and is capable of repaying it; however, she lacks collateral and therefore cannot credibly commit to repayment, and so the bank is unwilling to extend these otherwise-profitable loans. The local politician is vested with the power to choose the beneficiaries of government anti-poverty programs, and desires political support from his constituents; however, they too face a commitment problem, because both support and aid are costly. I show that if the politician sufficiently values the constituent's support, there is a Pareto-optimal subgame perfect Nash equilibrium in which all three actors take a grim-trigger strategy in response to a defection in either game, and that this allows the actors to obtain the Pareto-optimal outcome under conditions in which bilateral grim triggers would not be equilibria. This predicts that constituents with a higher valuation for the politician's aid will receive more aid, give more political support, and receive more loans under a president with high valuation of support than under a president with a low valuation of support.

In Section 4, I test the key prediction of this model by regressing two forms of aid, the microcredit's political support for the president, and bank loans received on exogenous variation in

reelection eligibility caused by the reservation system, measures of the microcredit group's aid valuation, and their interaction. I find that, consistent with my theory, an increase in the president's eligibility for reelection causes large increases in credit, both forms of aid, and political support in high-valuation groups relative to low-valuation groups. I also consider two alternate hypotheses that could also produce these results and show robustness checks that provide evidence against these hypotheses. Section 5 concludes.

2 Institutional Background

In order to justify the model I present in the next section, in this section I detail the structure of elected local government in Tamil Nadu and its relationship with the "Self-Help Group" style of microcredit. I show that a particular elected official, the *gram panchayat* president, has authority over the provision of two important forms of aid and the distribution of this aid comprises a large part of his responsibilities, but that he[2] has few other formal powers. I also show how the reservation system which guarantees that historically low castes represented in local government causes high-caste presidents to face uncertain term limits. Finally, I discuss how Self-Help Groups receive loans from local bank branches, and show that these groups are used as sources of political support by elected officials at the local and state level.

2.1 *Gram Panchayats*

In 1992, the central government of India passed the 73rd Amendment of the Constitution, which mandated the creation of a three-tier system of local elected government, with the most local tier being the *gram panchayat* (GP). In Tamil Nadu, a single GP covers a village or a small group of villages with total population between 500 and 10,000. The GP council consists of a president, who is elected by popular vote[3] of the entire GP, and between six and fifteen representatives elected by individual wards within the GP. Elections for all offices are held every five years, beginning in October 1996.

The GP government has few formal responsibilities and resources. Its primary roles are to provide public goods such as roads and sanitation and to select beneficiaries for certain government anti-poverty programs (Besley, Pande, and Rao 2007). The majority of its revenue comes from block grants from the state and central governments (Munshi and Rosenzweig 2010), augmented by very limited taxation powers. It does not have any legislative duties or powers, and has no formal oversight powers over police, the local government bureaucracy, or the local

[2]For clarity, throughout this paper I refer to presidents and politicians as male, and borrowers and constituents as female, despite the presence of female presidents and male borrowers.

[3]In West Bengal and Rajasthan, the states studied in Chattopadhyay and Duflo (2004) and Bardhan, Mookherjee, and Torrado (2010), the president is instead indirectly elected in the manner of a parliamentary democracy, with different implications for effective term limits.

branches of public banks. The ward representatives are not paid (although the president does receive a monthly travel stipend) and the GP government has very few employees. However, GP officials may have an indirect ability to influence outcomes outside of their direct control due to their interactions with state and national officials. Evocatively, one GP president, when asked what made him an effective president, pointed to a picture on his desk of him shaking hands with the current MLA (Member of Legislative Assembly, the state-level elected representative).

This paper follows Besley, Pande, and Rao (2007) and Bardhan, Mookherjee, and Torrado (2010) in examining the GP government's role in the selection of aid beneficiaries (as opposed to Chattopadhyay and Duflo (2004) and Munshi and Rosenzweig (2010), which consider its role in provision of public goods). I consider two specific forms of aid, house construction and guaranteed employment. House construction aid is provided through a long-running national program (IAY) and a recently-started state program (KVVT), which are both intended to replace thatch-roof huts with cement houses. Guaranteed employment is provided through the National Rural Employment Guarantee Scheme (NREGS), a public works program started in 2008 which is intended to guarantee 100 days of annual employment to every household in rural India. The funding from these programs is quite large relative to the overall operating funds of the GP. In 2010, the three programs combined received Rs.48 billion (approximately $1.1 billion) in funding for operations in Tamil Nadu, while the State Grant to GPs totaled only Rs.14 billion (approximately $311 million) (TNRD 2010a). NREGS in particular has become a large component of rural life; an NGO in my study area that specialized in the export of handicrafts reported having difficulty recruiting local artisans since the introduction of NREGS, and my survey team frequently had to work around the respondents' NREGS schedules.

The GP president plays a large role in the selection of aid beneficiaries, with both formal and *de facto* power to choose the level of aid received by each constituent. The official implementation procedures for NREGS and the national housing aid program in Tamil Nadu give the GP president specific powers: he has the "responsibility of allocating employment opportunities" (TNRD 2006) and is the only fixed member of the committee responsible for the selection of housing aid beneficiaries. This is supported by evidence at the local level: a 2001 study of 20 GPs in Uttar Pradesh (another Indian state), found that in almost all cases "the names of the beneficiaries [for government housing aid] have been finalized by the pradhan [GP president], his henchmen, and ultimately by the village- and block-level functionaries" (Srivastava 2006), and in my survey I found that 70% of housing aid recipients reported that the GP president helped them get the aid and 12% reported that their ward representative helped them. Besley, Pande, and Rao (2007) also discuss the process of beneficiary selection for valuable ration cards intended for poor recipients, and report that GP politicians are more likely to possess these cards than others despite being wealthier on average, strongly suggesting that these politicians have influence over aid distribution.

2.2 GP reservation policies

As part of the 73rd Amendment, GP president positions in each block[4] are set aside ("reserved") for members of the historically "low" Scheduled Castes (SC) in proportion to their population in the block. In addition, one-third of positions are reserved for women.[5] The implementation of this reservation system varies somewhat from state to state. In Tamil Nadu, the reservations were initially set before the first election in 1996, and rotate every other election (in 2006 and upcoming in 2016) to GPs that have not previously been reserved for that group. For example, of the 27 GPs in my survey, 9 GPs were reserved for women from 1996-2006, 9 different GPs were reserved for women from 2006-2016, and in 2016 the final 9 GPs will be reserved for women from 2016-2026.

The reservation process is carried out by the District Rural Development Agency on a block-by-block basis, using data from the most recent national census (the 1991 census for the 1996-2006 rotation period, and the 2001 census for the 2006-2016 period). First, the District Rural Development Agency uses the percent of the block population which is SC to determine the number of SC-reserved GPs in the block. Then they assign SC-reservations to the GPs in the block with the highest percent SC *that have not previously been SC-reserved*. After this, they assign female reservations to the top third of GPs in each category (SC-reserved and non-SC-reserved) by percent female, once again skipping those which have previously been female-reserved. The reservation assignments are released publicly roughly 6 months before the election.

While the intent of this law is to increase the political participation of historically underprivileged groups, the rotation system also has the effect of creating pseudo-random term limits for some presidents. Each male non-SC president faces the possibility that he will be ineligible to run in either the next election or the election after next (recall that reservations are only rotated every other election). The probability that he will be ineligible due to his caste is based on two factors: the percent SC in his GP relative to the others in his block, and the reservation history of the GPs in his block. For instance, a GP that was SC-reserved from 1996-2006 will not be SC-reserved in either the 2006-2016 or 2016-2026 periods, so that the GP president elected in 2006 knows that either he or his wife will still be eligible for election in 2016. Similarly, a GP with very few SC residents is unlikely to ever be assigned an SC-reservation, so the president of that GP in 2006 also knows that he or his wife will be eligible for election in 2016.

I focus on the term limits created by the rotation of SC reservations, rather than those created by female reservations, due to the possibility of a 'dynastic' situation in which male and female

[4] A block, also called a *tehsil* or *taluk*, is an administrative unit roughly equivalent to a county. As of the 2001 census, there were 5564 administrative blocks in India, with average population of approximately 200,000.

[5] Unreserved seats can be contested by any member of the GP, including women or SCs/STs, but are almost always occupied by non-SC/ST men.

members of the same household alternately run for office; the work of Dal Bó, Dal Bó, and Snyder (2009) shows that this is a very salient concern (albeit in the very different context of U.S. congressional races), and anecdotal evidence suggests that husband-and-wife presidential pairs are not uncommon[6]. Since castes are largely endogamous and caste status is inherited (Munshi and Rosenzweig 2009), a single household almost never contains both SC and non-SC members, which removes this complication.

2.3 Self-Help Groups

Self-Help Groups (SHGs) are an extremely widespread form of microfinance supported by the Indian government, particularly in South India. An SHG is a group of between 10 and 20 people, usually women, that combines aspects of an accumulating savings and credit association with no-collateral, joint liability microcredit. An SHG is typically formed by a 'promoter', which can be an NGO, government agency, bank, or private individual, who approaches women in a village and provides training and resources to set up the SHG. As part of the training, the SHG learns to maintain records of its financial activities.

Initially, the SHG functions as accumulating savings and credit associations; each member saves a small amount of money with the SHG every month, and the SHG lends that money back to individual members. After successfully functioning in this way for at least six months, the SHG may then apply to a bank for no-collateral, joint liability loans, which range in size from Rs.10,000 to Rs.500,000 (about US $200 - $1250) and have durations of 12 to 36 months. These loans are usually split up among the members of the SHG; they are also occasionally used for investments in a joint business venture. Estimates of the repayment rates for these bank loans range from 88% to 95% (Sinha 2009), which is not atypical for microcredit.

Unlike the state and central governments, which fund SHG promoters, subsidize certain types of lending, and provide refinancing to banks which lend to SHGs, the GP government has no formal relationship with SHGs and has no formal power over banks or SHG promoters. However, in my discussions with GP presidents, they have described themselves as playing an important role in SHG lending in several ways. These include giving their constituents information about the availability and attractiveness of different loans, suggesting to bank officials which SHGs may be suitable for loans and encouraging SHGs to repay their loans in a timely manner. This informal engagement with the lending process is consistent with my theoretical model.

GP presidents have good reason to get involved: SHGs are widely recognized as being potential sources of political support. In Tamil Nadu, state-level elected officials take credit

[6]This does not contradict the evidence in Chattopadhyay and Duflo (2004) showing that male and female presidents provide more of the public goods favored by their own gender, because there is no reason to believe that providing public goods favored by one gender or another should affect reelection prospects.

for the growth of SHGs, promise additional support for SHGs present themselves as being responsible for nurturing SHGs, and hold rallies in which they preside over the distribution of SHG loans (The Hindu 2008). Kalpana (2008) also describes an instance in which SHG members explicitly discuss the possibility of promising a local politician votes if he intervenes with the bank to help them receive loans. Finally, my respondents reported that 75% of their public political activities (such as attending rallies and canvassing for votes) were conducted through their SHG.

3 A Theory of Lending and Patronage

In this section, I present a simple model of no-collateral lending and patronage and show that a politician can facilitate lending between a bank and a constituent by making the constituent's access to government aid contingent on repayment of her loan. In return, the constituent provides the politician with political support, in the form of votes, donations, volunteering, or attending rallies.

I formulate this as an infinitely-repeated game between constituent, bank, and politician and derive the conditions under which lending, aid, and support can obtain in equilibrium. Each stage game has two components: a bilateral lending game in which the bank chooses whether to make a no-collateral to the constituent and the constituent chooses whether to repay her loan, and a bilateral patronage game in which the politician chooses whether to give the constituent access to government aid and the constituent chooses whether to support the politician. I discuss how a trilateral grim trigger strategy can enable all three actors to reach a Pareto-efficient equilibrium under conditions where there are no Pareto-efficient bilateral equilibria, and derive testable predictions for how changes in the constituent's valuation of aid and the politician's valuation of support affect the incidence of aid, lending and support. My key prediction is that the interaction of the two valuations increases all three outcomes.

This set-up is similar to the 'community enforcement' games described in Kandori (1992). In that paper, he extends the result that any mutually-beneficial outcome of a stage game can be sustained as a subgame-perfect equilibrium in an infinitely-repeated game between the same players (Fudenberg and Maskin 1986) to stage games played repeatedly by different members of a population. In this case, the mutually-beneficial outcome of "lending, repayment, aid, support" can be sustained even though there are three players in the stage game rather than two. It is also similar in spirit to the joint-liability model of Besley and Coate (1995), in that the ability of two actors to discipline each other ("social capital") is used to overcome problems of strategic default.

In order to present the basic intuition of my model as cleanly as possible, I make three important simplifying assumptions. First, I consider a politician's interaction with one constituent

in isolation from his interaction with other constituents and have the politician derive intrinsic value from the constituent's support, rather than explicitly model the electoral process and make the politician value support as a means to reelection. Otherwise, the model would have to include a concept of the politician's optimal electoral coalition, and the testable predictions generated by such a model go beyond my data. Second, I treat the 'constituents' of this model as unitary decision-makers with well-defined utility functions, but in context a constituent represents an entire microcredit group. This 'unitary group' assumption is analogous to the common 'unitary household' assumption. Finally, I assume that all actors have complete information about each other's characteristics and actions. In the context of local politics, assuming perfect information between constituent and politician is not unreasonable, but in reality it may be very difficult for the bank to gather information about constituents (although this is not a concern if the politician and bank can communicate easily and are willing to share information). Models which weaken these assumptions and produce additional testable predictions are left for future work.

3.1 Set-up

There are three actors: a bank, a politician, and a constituent. The constituent is fully characterized by her valuation of aid $\nu_A \in [0,\infty)$, the value $\nu_L \in [1+r,\infty)$ of her potential investment, and her discount factor $\delta^C \in [0,1)$. In my empirical work, I use two measures of ν_A based on the two aid programs. For NREGS, households with unemployed or underemployed adults will have higher ν_A than households in which every adult member has a full-time job, and likewise for housing aid the households with thatch-roof huts will have higher ν_A.

The politician is described by his valuation of political support $\nu_S \in [0,\infty)$ and his discount factor $\delta^P \in [0,1)$. I focus on the variation in ν_S caused by term limits[7]: *ceteris paribus* a term-limited politician will have a lower ν_S, since he does not need to win the next election for his office. However, a term limit may not push ν_S to 0, because the politican may have some other use for that political support. For instance, he may run for a different office[8], or use the constituent's support on behalf of his party and be rewarded with an appointed position.

As noted above, I assume that all three actors have complete information about parameter values ν_A, ν_L, ν_S, δ^C ,δ^P, and r, and can observe all past actions.

[7] Alternatively, I could model term limits as causing a decrease in δ^P; as I show in section 3.5, the two are equivalent in my model.

[8] Supporting this idea, Ferraz and Finan (2009a) find that term-limited Brazilian mayors are more corrupt than those who do not face a term limit, but that this effect is lessened if the mayor then goes on to run for higher office.

3.2 Bilateral lending game

First, I consider the lending relationship in isolation from the patronage relationship. The bank, which faces no cost of capital, chooses whether to lend 1 unit of capital to the constituent at an exogenously-set interest rate r. The constituent then invests in a project that returns $\nu_L \geq 1+r$ with certainty and chooses whether or not to repay the borrowed principal. For simplicity, I collapse this process into a single-stage game, in which the bank chooses whether or not to lend and at the same time the constituent chooses her repayment strategy. The payoff matrix for the lending stage game is shown in figure 1, panel A, denoting the bank's choice to lend or not lend as L, NL and the constituent's choice to repay or not repay as R, NR. Note that (NL, R) and (NL, NR) have the same outcome, since the constituent's choice to repay is only relevant if the bank gives out a loan in the first place. This stage game is then repeated infinitely, with the constituent discounting between each round at factor δ^C.

Consider the following strategy profile:

Definition 1 In the **lending grim trigger** strategy profile, the bank chooses L if and only if the constituent has chosen R in all previous rounds, and the constituent chooses R if and only if the bank has chosen L in all previous rounds.

The constituent's IR constraint in this strategy profile is that ν_L, the present-discounted value of defecting to (L, NR) in the current round and then receiving the value of (NL, NR) in subsequent rounds, must be lower than $\frac{\nu_L-(1+r)}{1-\delta^C}$, the present-discounted value of receiving (L, R) outcome in this and all future rounds:

$$\delta^C \geq \frac{1+r}{\nu_L} \tag{1}$$

Since the lending grim trigger strategy profile results in (L, R) and enacts the maximum possible punishment for deviation, if it is not a subgame perfect Nash equilibrium then (L, R) cannot be the result of such an equilibrium. Thus (L, R) can only occur in bilateral equilibrium when equation 1 is satisfied.

There is no IR constraint for the bank because, unlike the constituent, the bank receives a higher payoff from the cooperative outcome (L, R) than it does from the defecting outcome (NL, R) and so it has no incentive to deviate. This means equation 1 is both necessary and sufficient to ensure that (L, R) is a bilateral equilibrium outcome.

3.3 Bilateral patronage game

In the patronage game, the politician chooses whether or not to give aid to the constituent, who values that aid at $\nu_A \geq 0$. Simultaneously, the constituent chooses whether or not to give political support to the politician, who values support at $\nu_S \geq 0$. I set both[9] the politician's

[9]Because these two costs are measured in different units (politician utility as opposed to constituent utility), I may normalize both to 1 without loss of generality.

cost of providing aid and the constituent's cost of providing support to 1. The cost to the politician could either reflect the opportunity cost of giving aid to this constituent rather than another or simply the foregone value of not embezzling the aid, while the cost to the constituent could either be the actual time cost of attending rallies or the opportunity cost of supporting this politician instead of a competitor. The payoff matrix for the bilateral patronage game is shown in figure 1, panel B, denoting the politician's choice to aid or not aid as A, NA and the constituent's choice to support or not support as S, NS. Note that (A,S) will only be the Pareto-efficient outcome if $\nu_S \geq 1$ and $\nu_A \geq 1$. As in the bilateral lending game, this stage game is repeatedly infinitely, with discount factors δ^C and δ^P for the constituent and politician respectively.

The grim-trigger strategy profile for this game parallels the lending grim trigger strategy profile:

Definition 2 In the **patronage grim trigger** strategy profile, the politician chooses A if and only if the constituent has chosen S in all previous rounds, and the constituent chooses S if and only if the politician has chosen A in all previous rounds.

Again, if this is not an equilibrium then (A,S) cannot be an equilibrium result. And just as in the lending game, the IR constraint for the constituent is that the value of a one-round defection ν_A must be lower than the value of continued cooperation $\frac{\nu_A - 1}{1-\delta^C}$. However, in this case the politician faces a symmetric IR constraint, that $\nu_S < \frac{\nu_S - 1}{1-\delta^P}$. Thus, (A,S) can only be sustained only if the parameters satisfy equation 2 and 3:

$$\delta^C \geq \frac{1}{\nu_A} \tag{2}$$

$$\delta^P \geq \frac{1}{\nu_S} \tag{3}$$

Equation 2 cannot be satisfied for any $\delta^C \in [0,1)$ when $\nu_A < 1$, as in this case the cost of supporting the president is higher than the constituent's value of aid. Similarly, equation 3 cannot be satisfied for any $\delta^P \in [0,1)$ when $\nu_S < 1$. As noted above, these are the same conditions for the Pareto-efficiency of the (A,S) outcome, so that it is never possible to sustain (A,S) in this equilibrium if it is not Pareto efficient.

3.4 Trilateral game

In the trilateral game, in each round the actors simultaneously play both the lending stage game and the political stage game. Clearly, the lending and patronage bilateral grim-trigger strategy profiles will continue to be equilibria under the same conditions as above, so that when equation 1 is satisfied, the (L,R) outcome can be sustained, and when equations 2 and 3 are satisfied the (A,S) outcome can be sustained. However, it is also possible to use a community enforcement mechanism to sustain cooperation in the trilateral game. I specifically consider a **trilateral grim trigger** strategy profile in which the politician and bank both stop cooperating with the

constituent if she defects in either game, and the constituent stops cooperating with both the politician and bank if either one defects. This strategy profile results in the fully cooperative outcome (L,R,A,S), and will be an equilibrium whenever there is an equilibrium that results in the fully cooperative outcome.

Definition 3 In the **trilateral grim trigger** strategy profile, the bank chooses L if and only if the constituent has chosen R and S in all previous rounds and the politician has chosen A in all previous rounds. The constituent chooses R and S if and only if the bank has chosen L and the politician has chosen A in all previous rounds. The politician chooses A if and only if the bank has chosen L in all previous rounds and the constituent has chosen R in all previous rounds.

In order for this strategy profile to be in equilibrium, the politician and constituent must satisfy certain IR constraints. Since the politician suffers the same consequences from defection in the trilateral game as he does in the patronage game, his IR constraint remains the same (and is given by equation 3). But the constituent now faces a new trilateral IR constraint, as defection in either game causes her to forfeit the potential benefits of all future cooperation in both games. This means that the most profitable possible deviation from her trilateral grim trigger strategy is to simultaneously default on her loan and withdraw support from the politician, yielding the following IR constraint:

$$\nu_L + \nu_A \leq \frac{\nu_L - [1+r] + \nu_A - 1}{1-\delta^C} \xrightarrow{rearrange} \delta^C \geq \frac{2+r}{\nu_L + \nu_A} \tag{4}$$

This IR constraint is always less restrictive than one of the previous two constituent IR constraints and more restrictive than the other. This is because the trilateral grim trigger strategy effectively operates by allowing the constituent to stake the surplus value of cooperation in one game (that is, the present-discounted value of repeated cooperation minus the present-discounted value of a one-time defection followed by repeated non-cooperation) as an additional cost of defection in the other game. This can only be a valuable commitment device if the surplus value of cooperation in one of the games is positive, which is precisely the condition under which the constituent's IR constraint for that game's bilateral grim trigger strategy will be fulfilled. This is shown in figure 2, which plots the three constituent IR constraints (equations 1,2, 4) with ν_A as the horizontal axis, δ^C as the vertical axis, and parameter values $r = 0.7$, $\nu_L = 2$.

3.5 Comparative statics

Consider a term-limited politician with constituents who vary in ν_A and δ^C but who have fixed ν_L and r. Because of the term limit, this politician has a low $\nu_S = \underline{\nu}_S < \frac{1}{\delta^P}$, and can not credibly commit to either the patronage grim trigger strategy or the trilateral grim trigger strategy since he does not fulfill his IR constraint (equation 3). This means that his constituents can only receive lending in equilibrium if they have $\delta^C \geq \frac{1+r}{\nu_L}$ (equation 1) and are therefore capable of committing to the lending grim trigger strategy, and since they only receive aid and give

support in equilibrium under the patronage grim trigger or trilateral grim trigger strategies, aid and support do not occur in equilibrium under this politician.

Now consider a politician who is likely to be able to run for reelection and who therefore has a high $\nu_S = \bar{\nu}_S > \frac{1}{\delta^P}$, satisfying equation 3. The bank can lend to his constituents in equilibrium so long as they fulfill equations 1 or 4, so that either the bilateral lending or trilateral grim trigger strategy profiles are equilibria. This means that any constituent who could receive a loan in equilibrium under the term-limited president can also receive a loan under the reelectable politician, and that there may be additional constituents who can receive loans under the reelectable politician but not under the term-limited politician. In other words, the constituents who can receive loans in equilibrium under the term-limited politician are a subset of the constituents who can receive loans in equilibrium under the reelectable president.[10]

The solid line in Figure 2 shows the minimum level of δ^C for which equilibrium lending occurs under a reelectable politician as a function of ν_A. Note that more lending is possible as ν_A increases. By contrast, the minimum level of δ^C for lending under a term-limited politician is given by $\frac{1+r}{\nu_L}$ and stays constant as ν_A increases. Thus, as ν_A increases, so does the increase in potential lending associated with shifting from a term-limited to reelectable politician, since the loss from defection under the trilateral grim trigger strategy (available only under the reelectable politician) increases with ν_A while the loss from defection under the lending grim trigger strategy (available under either politician) does not.

The same will be true for aid and support. Under a reelectable politician, a constituent will receive aid and give support as long as she satisfies $\delta^C \geq \frac{1}{\nu_A}$ (equation 2) or $\delta^C \geq \frac{2+r}{\nu_L+\nu_A}$ (equation 4). Looking again at Figure 2, the minimum δ^C can be found by looking at $\frac{2+r}{\nu_L+\nu_A}$ until it intersects with the other lines and $\frac{1}{\nu_A}$ thereafter. This is clearly decreasing in ν_A, while means that more lending is occurring as ν_A increases, and since no aid or support at all can occur under a term-limited politician this means that the effect of an increase in ν_S on aid and support will also be increasing in ν_A.

This intuitively leads to my key theoretical prediction:

Prediction 1 The average effect of an increase in the politician's valuation of support ν_S from $\underline{\nu}_S$ to $\bar{\nu}_S$ on the lending received by constituents with aid valuation ν_A is an increasing function of ν_A. The same is true for the aid received and support given to the politician.

I show this prediction formally by defining the function $\Delta_Y(\nu_A)$ to be the effect of a change from $\underline{\nu}_S$ to $\bar{\nu}_S$ on the average outcome $Y \in \{L, A, S\}$ (lending, aid, and support respectively) that can occur in the constituency as a function of ν_A, and then taking the partial derivative of this function with respect to ν_A. $\Delta_Y(\nu_A)$ is the difference between the lowest δ^C for which outcome

[10]Note that while I model the term-limited politician as having a low ν_S and the reelectable politician as having a high ν_S, it would be equally accurate to say that the term-limited politician has a low δ^P and the reelectable politician has a high δ^P.

Y is in equilibrium under the term-limited politician and the lowest δ^C for which outcome Y is in equilibrium under the reelectable politician, as the constituents between these two lower limits are the ones who are capable of receiving loans (or receiving aid, or giving support) under the reelectable politician but not under the term-limited politician. As discussed above, lending under the term-limited politician can occur when equation 1 is fulfilled, while lending under the reelectable politician can occur when either equations 1 or 4 are fulfilled. Therefore

$$\Delta_L(\nu_A) = \frac{1+r}{\nu_L} - \min(\frac{1+r}{\nu_L}, \frac{2+r}{\nu_L+\nu_A}) \tag{5}$$

Aid and support can only occur in equilibrium under the reelectable politician, and only with constituents who can credibly commit to either the patronage or trilateral grim trigger strategies (equation 2 or equation 4). Therefore the increase in aid and support associated with a change in ν_S will be

$$\Delta_S(\nu_A) = \Delta_A(\nu_A) = 1 - \min(1, \frac{1}{\nu_A}, \frac{2+r}{\nu_L+\nu_A}) \tag{6}$$

by the same reasoning as above.

If I take the derivatives of Δ_Y with respect to ν_A, I find that $\frac{\partial \Delta_A}{\partial \nu_A} = \frac{\partial \Delta_S}{\partial \nu_A} \geq 0$ and $\frac{\partial \Delta_L}{\partial \nu_A} \geq 0 \; \forall \; \nu_A \geq 0$. To see this simply, note that the right-hand term is non-increasing in ν_A, and since that term is subtractive Δ_Y is therefore non-decreasing in ν_A, which proves prediction 1.

4 Empirical Analysis

4.1 The Data

My empirical analysis uses novel data from a survey of SHG members in 27 rural GPs in one block of Vellore district, in northern Tamil Nadu, India, as well as census data from the 1991 and 2001 Indian censuses. The survey took place in three stages, beginning in June 2010. First, my survey team contacted local informants, SHG-promoting NGOs, and the Block Development Office and compiled a complete list of all 985 existing and defunct SHGs in the administrative block. Then, between November 2010 and January 2011, we attempted to interview one current or former leader from every group, conducting a total of 926 leader interviews (a 95% response rate). These leader interviews included questions about the SHG's saving and borrowing practices each year from 1997 to 2010. The respondents usually had access to the SHG record books, which aided in recall of this information. The interview also involved compiling a roster of current and former SHG members, which we used as a sample frame for the next stage, the member interview.

For the member interview, we sampled 5 current or former members from each SHG, excluding members who were reported to be dead or who had moved out of the survey area. Between January and April 2011, we interviewed 4101 of the 4630 members sampled (an

89% response rate). These member interviews included questions on household demographics, household living standards, and aid received from the government for each year from 1997 to 2010.

Table 1 contains group-level summary statistics on membership and bank lending. The rate of loan delinquency is only 4%, which is quite low even by the standards of microcredit. I suspect that this is an underestimate for two reasons: the SHGs who refused to participate in the leader survey probably had a higher rate of loan delinquency than participants, and the participants may have thought they were being evaluated for inclusion in a program of some kind (despite being told otherwise in the consent statement) and underreported their delinquency rates. Figure 3 shows the total number of active SHGs each year, which increases dramatically over the survey period.

In my analysis, I combine the responses from the leader and member surveys and form a pseudo-panel dataset at the SHG-year level. The dataset overlaps with two "rotation periods": 1996-2006 and 2006-2016. Because my key source of variation is in GP president term limits, which are assigned at the GP-rotation period level, I cluster at the GP-rotation period level as well for a total of 54 clusters. However, as I discuss in the next section, I exclude the 9 clusters which are reserved for SC presidents, leaving 45 usable clusters.

4.2 Variables of interest

4.2.1 Valuation of support E_{pt}

My empirical strategy relies on having a plausibly-exogenous source of variation in ν_S, the GP president's valuation of political support. Because much of the value of political support is tied to reelection, a non-SC president who thinks his GP will be SC-reserved next rotation period will *ceteris paribus* have a lower ν_S. I use simulation methods to construct reelection eligibility E_{pt}, which is an approximation of the probability that GP p will not be SC-reserved in the next rotation period.

As discussed in Section 2.2, the determinants of SC-reservation for the 2006-2016 rotation period are the %SC as of the 2001 census and the SC-reservation status of each GP in the 1996-2006 rotation period. Likewise, SC-reservations for 2016-2026 rotation period depend on the %SC in the 2011 census and the SC-reservation status for the 1996-2006 and 2006-2016 rotation periods. If a president had perfect information about these values for all 27 GPs, he could determine with certainty whether or not his GP would be reserved, and E_{pt} would either equal 0 or 1. While it is reasonable to assume that a president is aware of the relevant reservation histories, it is unlikely that he knows the exact %SC for each GP from the relevant census. Therefore, from the perspective of the president, the %SC in each GP is a random variable, and his probability of being eligible for reelection will be determined by the distribution of these

variables for each GP.

In order to approximate the perceived distribution of 2001 %SC, I assume that the president has accurate information about the 1991 %SC in each GP, and that he believes that the 2001 %SC of each GP will be equal to the sum of 1991 %SC and an independent identically distributed error term. I further assume that he has an accurate perception of the distribution of this error term, so that I randomly draw from the actual change in %SC between 1991 and 2001 when I conduct my simulations.

Based on these assumptions, I use a simple simulation method to construct reelection eligibility E_{pt}. I describe this process in detail in Appendix A, but, in brief, I create simulated data for %SC in 2001 in each GP by taking the true 1991 census data on %SC for each GP and adding a random error term. The error term is drawn from the 27 actual changes in GP %SC between the 1991 and 2001 census. Using the simulated %SC data, I assign simulated reservations according to the rules discussed in Section 2.2. After performing 10,000 of these simulations, I set E_{pt} for the first rotation period to be the fraction of simulations in which GP p was not reserved. I use a similar method for the second rotation period, again drawing error terms from the pool of changes between 1991 and 2001 (since data from the 2011 census was not available at the time of writing).

My approximation of how the GP president determines his probability of reelection eligibility is clearly very simplistic, and the values of E_{pt} are subject to considerable error. However, my empirical results are qualitatively unchanged if I use a binary variable E_{pt}^{high} in place of E_{pt}, where $E_{pt}^{high} = 1$ if $E_{pt} \geq 0.5$ (results shown in Appendix Tables A1 and A2). My results are therefore driven by large differences in eligibility rather than small differences, so that it is unlikely that the relatively small inaccuracies of my simulation method are important in my analysis. Figure 4 shows how eligibility and reservation status varied across GPs over the two rotation periods.

I exclude SC-reserved GP-rotation periods from my analysis due to the difficulty of coding E_{pt} for those clusters. Technically, SC presidents may be elected in unreserved GPs, so that an SC president (or a member of his household) will always be eligible for reelection, and thus $E_{pt} = 1$; however, this rarely happens in practice, which suggests that SC presidents may see themselves as facing very different reelection incentives than non-SC presidents. However, including these clusters and assigning them $E_{pt} = 1$ strengthens my results (shown in Appendix Tables A3 and A4).

Table 2 supports the exogeneity of E_{pt} by showing that there are no significant differences between the characteristics of SHGs in GPs with $E_{pt} > 0.5$ and the characteristics of those in GPs with $E_{pt} < 0.5$. The only exception is that the average fraction of SC members in each SHG in 2005 and 2010 is higher when E_{pt} is low, mostly likely because having a low E_{pt} is correlated with having a high %SC in the GP as shown in Figure 4. I therefore include a specification that

controls for this possible confounding variable.

4.2.2 Valuation of aid V_{gpt}

In order to test my predictions empirically, I construct measures of SHG-level valuation of two different forms of government aid: housing assistance and guaranteed employment. I will use these as my measures of ν_A, the valuation of aid.

I use the demographic characteristics of the sampled households to measure the SHG valuation of guaranteed employment aid. As demonstrated in figure 5, the most common users of NREGS are women between 18 and 70 years old with 8 or fewer years of education. This makes intuitive sense: these individuals are likely to be healthy enough to perform manual labor and relatively unlikely to have better employment opportunities. I choose 8 years of education as my cutoff because it is the threshold between elementary and secondary education, as defined by the 2009 Right to Education Act (Government of India 2009), as well as the median level of education for 18-70 year old women in my data in 2010. My results are sensitive in magnitude and significance to using alternate cutoffs, such as 5 years or 10 years (the 25th percentile and 75th percentile, respectively), but the signs remain the same.

I use two measures of NREGS valuation: the fraction of individuals sampled in the SHG who live in households with one or more such women, and the fraction who live in households with two or more such women. The first serves as a proxy for how much the SHG values the first 100 days of NREGS provided per household, while the second measures how much the SHG values values provision of NREGS beyond 100 days. Because the GP president is charged with ensuring that households do not exceed the 100 day limit on NREGS, he can very easily allow households to "double-dip" by having two members each work 100 days by simply turning a blind eye; however, it may be more difficult for him to deny households the use of NREGS up to 100 days. In terms of my model, it may be that the president's action of "giving aid" actually corresponds to "allowing the household a 100 day per member cap instead of a 100 day total cap", so that the proper measure of aid valuation is the value of *more than 100* days of NREGS, not the value of *up to 100* days of NREGS. I will therefore use the 2+ measure for most of the empirical work, and only use the 1+ measure as a robustness test (as described in section 4.5).

As a measure of how the much the SHG collectively values housing aid, I use the fraction of individuals sampled in the SHG who live in a thatch-roof dwelling (i.e. a hut). Individuals reported that government housing aid came partially in the form of materials in 63% of instances; certainly in these cases, the aid will be more valuable to those with huts than those with higher-quality houses. I use roof material as my indicator of low housing quality (instead of other features, such as the walls or floor of the dwelling) because the Tamil Nadu state government housing program KVVT specifically notes that "all huts with thatched roof irrespective of the type of wall of the huts, will be taken up for conversion into permanent houses" (TNRD 2010b).

Figure 6 shows the average fraction of huts per SHG over time and the average fraction of households with 1+ and 2+ low education women per SHG. As should be expected, the fraction of huts is decreasing over time (due to government intervention and general economic growth), while the fraction of low education women remains more or less constant.

4.2.3 Outcome variables

The four outcomes under consideration are housing aid given to SHG members, NREGS aid given to SHG members, political support given to the president by SHG members, and lending by banks to the SHG. For housing aid, I use the value of housing aid (in thousands of Rs.) received by each sampled household in each year, averaged across all sampled households in the SHG. For NREGS aid, I use the total number of person-days of NREGS attended by members of each sampled household in each year, again averaged across sampled households in the SHG. For political support, I use the average hours spent by SHG members each year in political activities (such as attending rallies or speeches, or canvassing) that were planned by the GP president, supported the GP president, or which the GP president asked them to attend. For bank lending, I use annual bank lending (in thousands of Rs.) to each SHG in each year.

All values are self-reported. While the respondents typically had access to SHG record books, which helped them recall details of loans, the respondents undoubtedly made mistakes in giving the details of housing aid received and political support given over the past 14 years. Since these are outcome variables, measurement error should increase the standard errors of my estimates but should not be a source of bias. The NREGS data will also be subject to this source of measurement error, but to a much lesser extent since that program has only been in place since 2008.

Figure 7 shows the change in average housing aid and NREGS use over time. Housing aid is low and roughly constant from 1997-2009, except for a spike in 1998 that is likely due to the small number of SHGs in existence at that time (as shown in figure 3), then experiences a jump in 2010 with the introduction of KVVT. NREGS usage increases steadily from 2008-2010 as the program expands. Figure 8 shows the change in political support and credit. For the recent and upcoming elections, political support increases in election years (2006) and in the year before the election year (2005, 2010), while credit is expanding rapidly over the survey period. Note that this is average credit per SHG, and that the number of SHGs also increased rapidly over this period, so that the total credit is expanding even faster.

4.3 Empirical strategy

Using E_{pt} as my measure of the president's support valuation and V_{gpt} as my measures of the SHG's aid valuation, and assuming that E_{pt} is exogenous, I can test my model by estimating a

simple interacted OLS regression:

$$Y_{gpt} = \beta_0 + \beta_1 V_{gpt} + \beta_2 E_{pt} + \beta_3 E_{pt} * V_{gpt} + \mu_t + \varepsilon_{gpt} \quad (7)$$

where Y_{gpt} is one of the four outcomes described above for group g of GP p in year t, V_{gpt} is a measure of the group's valuation of aid as described above, and E_{pt} is the probability that the GP president will be eligible for reelection in the next rotation period.

The key empirical test is to show that the coefficient on the interaction term $E_{pt} * V_{gpt}$ is positive. Due to the inclusion of this interaction term, the coefficient on eligibility E_{pt} should be interpreted as the effect on the outcome of an increase in eligibility when the valuation of aid is 0. However, because my measures of aid valuation (low education adult women and thatch roof huts) are very likely to be correlated with unobservable drivers of the outcomes, such as poverty, the coefficients on aid exposure V_{gpt} will be biased and do not have a causal interpretation.

Since all variables change substantially over time, I include year fixed effects μ_t in all specifications. I also include specifications with GP fixed effects to increase power and to allow for the possibility that GPs may have different aid budgets:

$$Y_{gpt} = \beta_0 + \beta_1 V_{gpt} + \beta_2 E_{pt} + \beta_3 E_{pt} * V_{gpt} + \mu_t + \chi_p + \varepsilon_{gpt} \quad (8)$$

In specifications where V_{gpt} is the valuation of NREGS, I restrict my sample to 2008-2010, so that there will only be one value of eligibility for each GP. For these specifications, eligibility will be collinear with the GP fixed effects and thus I do not report it in the results table.

I also include a specification with GP-year fixed effects, which fully control for differential changes over time between GPs:

$$Y_{gpt} = \beta_0 + \beta_1 V_{gpt} + \beta_2 E_{pt} * V_{gpt} + \theta_{pt} + \varepsilon_{gpt} \quad (9)$$

Note that, in this case, eligibility will always be collinear with the GP-year fixed effects and so eligibility will always be excluded from the results table.

I include two more specifications to deal with concerns that eligibility may be endogenous. Since eligibility is determined by factors including the %SC in GP p as of the last census, one legitimate concern is that the coefficients on eligibility and the interaction in equations 5-7 will actually be picking up some effect of $\%SC_{pt}$ and its interaction with aid valuation $\%SC_{pt} * V_{gpt}$. I therefore include a specification that controls for those variables:

$$Y_{gpt} = \beta_0 + \beta_1 V_{gpt} + \beta_2 E_{pt} + \beta_3 \%SC_{pt} + \beta_4 E_{pt} * V_{gpt} + \beta_4 \%SC_{pt} * V_{gpt} + \mu_t + \chi_p + \varepsilon_{gpt} \quad (10)$$

Another concern is that the SHGs in high eligibility clusters differ systematically from SHGs in low eligibility clusters; for instance, SHGs in low eligibility clusters are more likely to be SC. I therefore include a specification with a vector of SHG-level controls $\mathbf{X}_{gpt}$:

$$Y_{gpt} = \beta_0 + \beta_1 V_{gpt} + \beta_2 E_{pt} + \beta_3 E_{pt} * V_{gpt} + \gamma \mathbf{X}_{gpt} + \mu_t + \chi_p + \varepsilon_{gpt} \quad (11)$$

where $\mathbf{X}_{gpt}$ includes SHG size, fraction of members in households where the primary earner is a fieldworker, fraction of members who are SC, and fraction of members in households with a member that has 12 or more years of education.

4.4 Results

The results from equations 7-9 for NREGS valuation and housing aid valuation are presented in tables 3 and 4. The results for NREGS valuation are very consistent with my key theoretical prediction: for all three outcomes, the interaction coefficient is large, positive, and significant. In the regressions using housing aid valuation, the interaction coefficient is large and positive for housing aid and credit, but there is no effect on support and the effect on credit is only 95% significant when I include year and GP fixed effects. This may be because housing aid is given much less frequently than NREGS, lowering the power of the statistical tests, and in addition problems of recall may be exacerbated for housing aid and for the more distant past as discussed above.

The results from equations 10-11 are presented in tables 5 and 6. For the NREGS specifications, including $\%SC$ and its interaction or the SHG controls has a negligible effect on the magnitude or significance of the interaction coefficient for any outcome. The housing aid specifications are also mostly robust to these inclusions, however the interaction coefficient halves in magnitude and becomes insignificant in the specification including $\%SC$, as shown in column 5 of table 6. However, it remains positive and is still quite large relative to average credit.

The effect of the interaction on credit is extremely large. In an SHG where all members live in households with two or more low-educated women, going from an ineligible president to a fully eligible one increases the bank credit received by the SHG by Rs. $57,690$ per year in my specification with year and GP fixed effects. This is roughly equal to the *overall* average annual bank credit received by SHGs over the period. Another way to look at it is that, with an average SHG size of 15.2 members, each affected SHG household receives Rs. $3,795$ more credit on average each year. This increase is equal to roughly 8% of the average rural household income in India in 2005 of Rs. $48,097$ (Shukla 2010). The differential increase in credit caused by the same change in presidential eligibility for an SHG where all members live in huts as compared to an SHG where no members live in huts is estimated to be Rs. $20,920$ in my preferred specification, corresponding to Rs. $1,376$ more credit per household, or about 3% of income.

In my model, the president uses access to aid as an incentive to induce SHGs to repay their loans. For this to be the case, the increase in aid should be comparable in magnitude to the increase in credit; if the effect on aid were much smaller than the effect on credit, it would be implausible that the aid promised would be sufficient to induce the SHG to repay the loan. The average annual increase in NREGS usage per household that results from a president going

from completely ineligible to completely eligible for an SHG where all members live in households with two or more low-educated women is 22.2 days. Multiplied by the NREGS daily wage of Rs. 80 in 2008 and 2009, the average increase in income per household is Rs. $1,776$, a significant fraction of the Rs.$3,795$ increase in SHG credit. Given that the increased access to NREGS may be sustained over several years, this effect could easily be of similar magnitude to the effect on lending. Similarly, an all-hut SHG receives Rs. $1,250$ more housing aid per member than a no-hut SHG if the president is fully eligible instead of completely ineligible. This is very similar to the credit increase of Rs. $1,376$ per household experienced by those SHGs. It makes sense that the ratio of aid to credit is higher for housing aid than for NREGS, since housing aid is a one-time transfer rather than a flow of income (as is NREGS). The magnitude of my results is thus quite consistent with the assumptions of my model.

The weakest results occur when political support is the outcome variable. For the housing aid valuation specifications, I find that the interaction coefficient is completely insignificant in table 4, and it actually becomes negative (although still insignificant) in the specifications of table 6. While these regressions are likely to be subject to a large degree of measurement error, since it is difficult to remember attendance at political events 10 years in the past, even in the more recent NREGS valuation specifications the coefficient is not very large (although it is significant): the differential increase in political support is only 14.4 minutes per member per year. This would appear to be a very small price to pay, given the large payoff in aid and credit discussed above. However, the show of public support is likely to be indicative of how the SHG members and their families will vote, which means that it may carry a higher value to the president than it would otherwise seem. It is then more relevant to consider the increase in political support relative to average levels of support, and in that light the effect is quite large, as SHG members on average spent only 6.6 minutes per year supporting the president politically between 2008 and 2010.

While my model only has strong predictions for the interaction coefficient of these regressions, the coefficients on eligibility and valuation deserve mention as well. The coefficient on eligibility, which can be interpreted as the effect of eligibility when the SHG has the minimum possible valuation for aid, is never statistically significant at the 95% level. This is roughly consistent with my model, because if the president truly had nothing to offer the SHG, then he would have no way of motivating the SHG to support him or to repay their loans, and so whether the president values political support will not be relevant in determining any of the outcomes. The coefficient on valuation cannot be causally interpreted, but the fact that higher valuation is associated with a significant *decrease* in credit under an ineligible president suggests these characteristics are indeed picking up the effect of poverty as I suggested above. One surprising result is that there is a robust negative correlation between higher housing aid valuation and lower levels of housing aid. While this does not contradict my model, intuitively

one would expect that a program intended to upgrade huts would succeed at distributing more aid to households living in huts than to households living in houses, even under an indifferent president. The fact that it does not may reflect just how much personal discretion the president has over the allocation of this aid.

4.5 Robustness tests

There are two other competing theories that could explain the pattern of results showed above. The first competing theory is that the presidents that are likely to face reelection will do a better job of distributing aid to the households who can benefit most from it, and that, as a consequence of receiving aid, household income increases and this directly increases creditworthiness. I can test this theory by using "fraction of members in households with *one* or more low education adult women" as my measure of NREGS valuation $V_{gpt}^{N'}$:

$$Y_{gpt} = \beta_0 + \beta_1 V_{gpt}^{N'} + \beta_2 E_{pt} + \beta_3 E_{pt} * V_{gpt}^{N'} + \mu_t + \varepsilon_{gpt} \tag{12}$$

Having one potential NREGS user in the household should increase the household's income upon the introduction of NREGS, while having two potential NREGS users will increase the household's income further *only if* the president allows the household to exceed the legal limit of 100 days per household. This allows me to distinguish the straight effect of an increase in income from the effect of increase in income subject to the president's discretion. While I do not have a similar test for housing aid, it is a one-time transfer that is likely to result in decreased eligibility (if, as intended, the household uses the aid to upgrade their dwelling) rather than a continual stream of benefits for which the household will remain eligible. This makes it unlikely that an increase in housing aid will substantially increase the SHG's ability to repay loans.

The results of equation 12 are reported in table 7, and are not consistent at all with the "increased income" theory. There is a large increase in NREGS usage among SHGs that have many households with one or more likely NREGS user, and this does not change with the president's eligibility; however, there is no corresponding increase in credit, but rather an (insignificant) decrease. This makes it highly unlikely that my previous results have been caused by a mechanical relationship between NREGS aid and creditworthiness.

Another possibility is that the presidents have the ability to force the banks to make certain loans (possibly through connections with state-level officials with more direct influence), and that the president believes that the constituents with high valuations of aid are the marginal voters who can be convinced to vote for him if he forces the bank to give them additional credit. I conduct two tests to distinguish this theory from my theory. The first test is to use loan delinquency D_{gpt} as my outcome:

$$D_{gpt} = \beta_0 + \beta_1 V_{gpt} + \beta_2 E_{pt} + \beta_3 E_{pt} * V_{gpt} + \mu_t + \varepsilon_{gpt} \tag{13}$$

While default does not occur in equilibrium in my theoretical model, obviously in reality some borrowers default on their loans or have other difficulty repaying; in my data, about 4% of completed loans were reported as having late or low payments, or as resulting in default. In my model, the loans given out to constituents with high valuations of aid under presidents with high eligibility for reelection are unlikely to have higher levels of delinquency, since these groups have additional incentive to repay. However, if the presidents are pressuring the banks to increase lending to certain borrowers, those marginal borrowers should be worse credit risks, and in that case I would expect to observe a positive interaction coefficient.

The results of equation 13 are reported in table 8: the interacted effect is consistently large and *negative* but insignificant. This is consistent with my model but not the alternative.

The forced lending model also requires the assumption that the constituents with high valuations of aid are the marginal voters. If the identity of the marginal voters is not changed by the introduction of NREGS, then a president with high eligibility should be increasing credit to individuals with high valuations of NREGS aid even before the introduction of NREGS. I can test this empirically by rerunning equations 7 and 8 for the pre-NREGS period. Under my model, I would expect to see that the interaction has no effect on support or credit, and under this alternate model I would expect to see that the interaction increases credit and support.

These results are reported in table 9. The interaction coefficient is insignificant and does not follow the same pattern as the results of equations 7-8 (shown in table 3), which again is consistent with my model but not with the alternative .

5 Conclusion

This paper has proposed a new channel by which a politician may intervene in the credit market without pressuring banks to increase or redirect lending. Instead, the politician can make a constituent into a more attractive credit risk by making her receipt of private government aid conditional on her loan repayment; this allows the constituent to credibly commit to repaying her loan in much the same manner as collateral. However, the politician's offer to deliver benefits is itself only credible if the politician values the constituent's support. I have shown evidence of this dynamic with novel data from a survey of microcredit groups in South India: a constituent with high aid valuation receives more aid, spends more time supporting the politician and his political allies, and receives more credit than a constituent with low valuation, but only when the politician is likely to be eligible for reelection. With additional robustness checks, I have ruled out the possibility that the politician is applying pressure to the banks to increase lending or that receiving aid directly increases the income of the constituent and thus her capacity to receive credit.

These findings show that political involvement in the credit market could be beneficial not

only for the borrower and the politician, but for the bank as well; this parallels Maurer and Haber (2007), which showed that loans to firms with close associations to the lending bank (so-called 'related lending') performed as well as other loans in late 19th century Mexico, and runs contrary to the three prevailing views of government lending. And while my results do not permit me to perform welfare calculations or make claims regarding the efficiency of this brokered lending, it is notable that the households which received additional credit were those with low-quality housing and with multiple women with low levels of education, characteristics which may be associated with poverty and inability to access alternate forms of credit.

Finally, my model of the politician as broker could have applications beyond the context of low-collateral credit markets. The interdependence of politician and constituent could allow the politician to play an informal role in any relationship that requires the constituent or politician to make a credible commitment. This is especially true at the local level, where the politicians have more direct contact with constituents and the party apparatus may be weaker, and in developing countries, where contract enforcement is more difficult and costly. Shedding light on the hidden role of local politicians could provide social scientists and policymakers with novel insights into these vital but opaque areas of the economy.

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A Simulation method for generating E_{pt}

I use data on GP populations in 1991 and 2001 perform a simple simulation of GP-level population dynamics and use the result to construct a variable E_{pt}, the probability that the current president of GP p, or his or her spouse, will be eligible for reelection in the next rotation period.

In the first step, I used census data on the %SC members in each GP p for 1991 (labelled $S_{p,1991}$) and 2001 ($S_{p,2001}$) and found the difference between them ($\Delta_{1991,p} = S_{p,2001} - S_{p,1991}$). I also used a binary variable indicating SC reservation status for the first reservation period, $R_{p,1997}$. In each simulation i, I constructed a counterfactual 2001 %SC for each GP, $\hat{S}^i_{p,2001} = S_{p,1991} + \hat{\Delta}^i_{1991,p}$, where $\hat{\Delta}^i_{1991,p} = \Delta_{1991,r}$ for a randomly selected r. Since there were 5 GPs that were SC-reserved for the second reservation period, I constructed a counterfactual reservation variable $\hat{R}^i_{p,2007}$, which took value 1 if $\hat{S}^i_{p,2001}$ was among the top 5 $\hat{S}^i_{p,2001}$ *that were not SC-reserved in 1997*, and 0 otherwise. In other words, I created a counterfactual for 2001 by taking the value for 1991 and then adding a random error term, which was distributed the same as were the GP population changes between 1991 and 2001. I then assigned simulated reservation status on the basis of those population changes.

I performed this simulation 10,000 times, and use the results to set E_{pt} for the first reservation period:

$$E_{pt} = \frac{\sum_i [1 - \hat{R}^i_{p,2007}]}{10000} \text{ if } t < 2006 \text{ and } R_{p,1997} = 0 \tag{14}$$

In the second step, I used a similar procedure again to find E_{pt} for the second reservation period. Since the 2011 census data was not yet available at the time this was written, I assumed that the dynamics between 2001 and 2011 were the same as the dynamics between 1991 and 2001, and set $\hat{\Delta}^i_{2001,p} = \Delta_{1991,r}$ for a randomly selected r. I then generated $\hat{S}^i_{p,2011} = S^i_{p,2001} + \hat{\Delta}^i_{2001,p}$, and constructed the counterfactual reservation variables $\hat{R}^i_{p,2017}$ to take value 1 if f $\hat{S}^i_{p,2011}$ was among the top 5 $\hat{S}^i_{p,2011}$ *that were not SC-reserved in 1997 or 2007*, and 0 otherwise. I then used those results to set E_{pt} for the second reservation period:

$$E_{pt} = \frac{\sum_i [1 - \hat{R}^i_{p,2017}]}{10000} \text{ if } t >= 2007 \text{ and } R_{p,1997} = R_{p,2007} = 0 \tag{15}$$

Figure 1: Stage Games

Panel A: Lending Game

Constituent \ Bank	L	NL
R|L	λ – (1+r),r	0,0
NR|L	λ,-1	0,0

Panel B: Patronage Game

Constituent \ Politician	A	NA
S	α-1,σ-1	-1,σ
NS	α,-1	0,0

Figure 2: Constituent IR Constraints

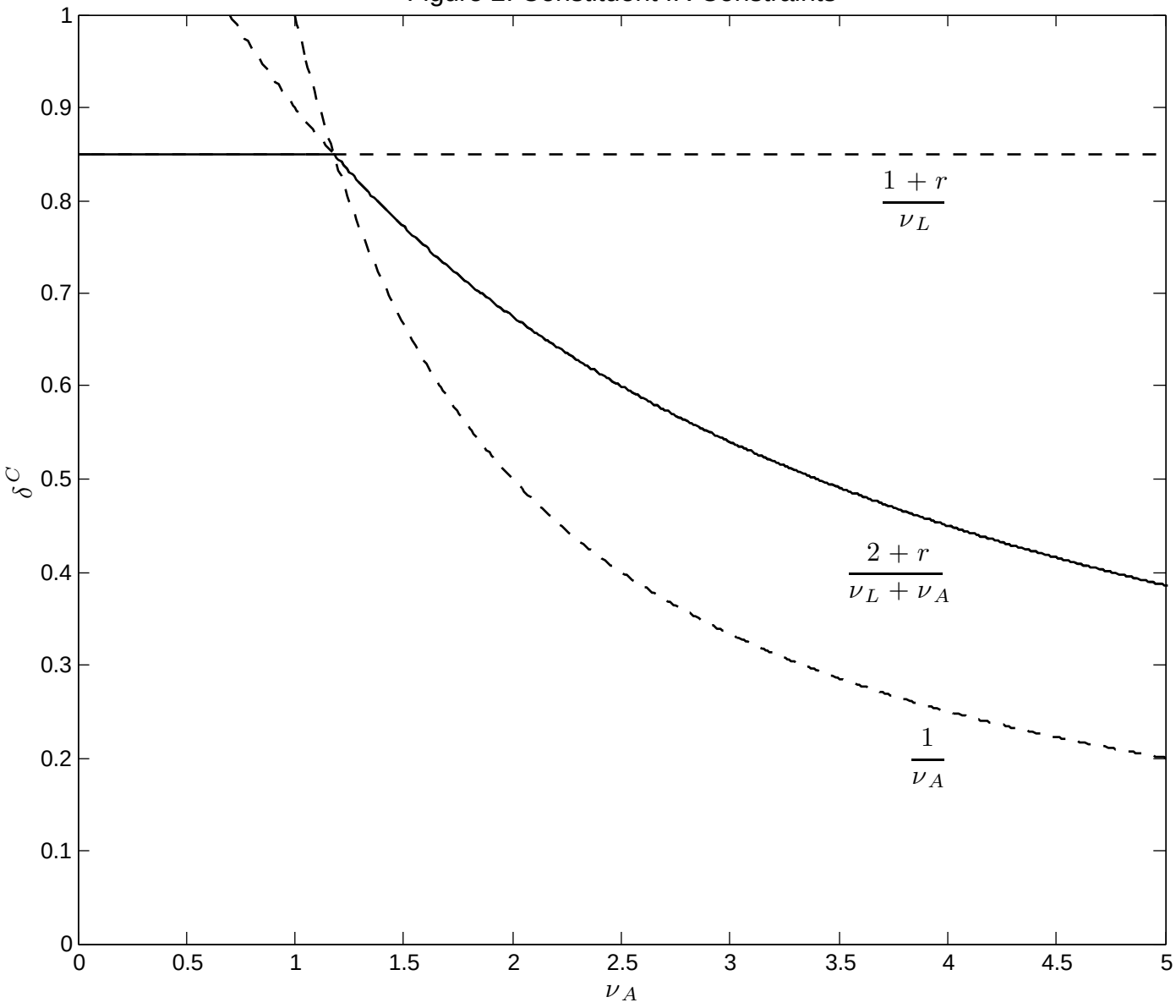

Figure 3: Number of SHGs

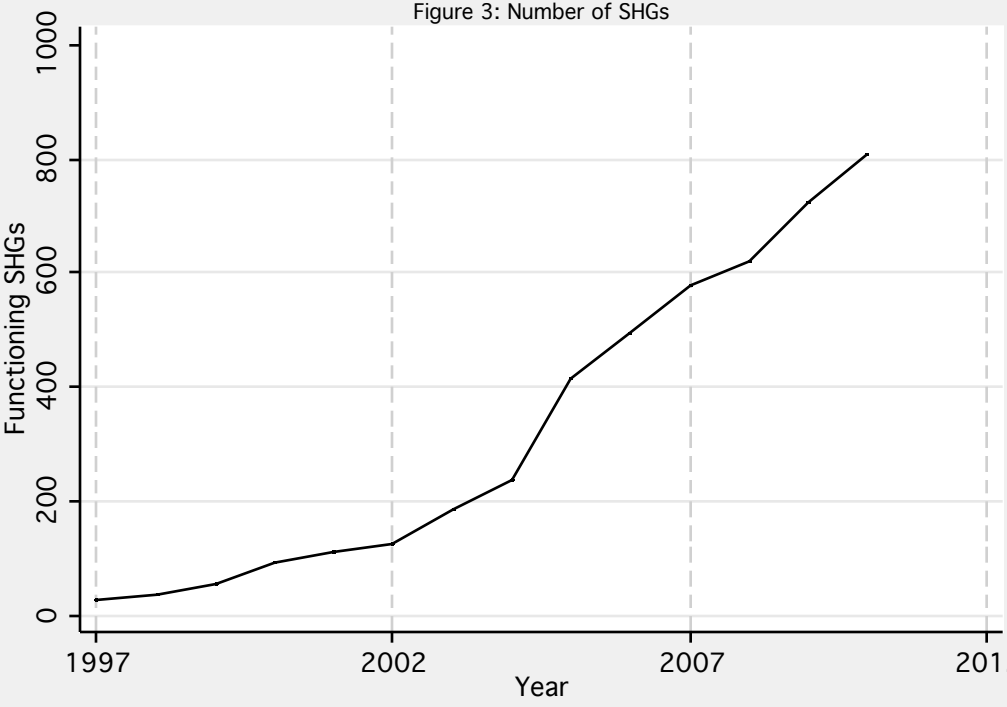

Figure 4: GP President Eligibility by %SC in GP in 1991

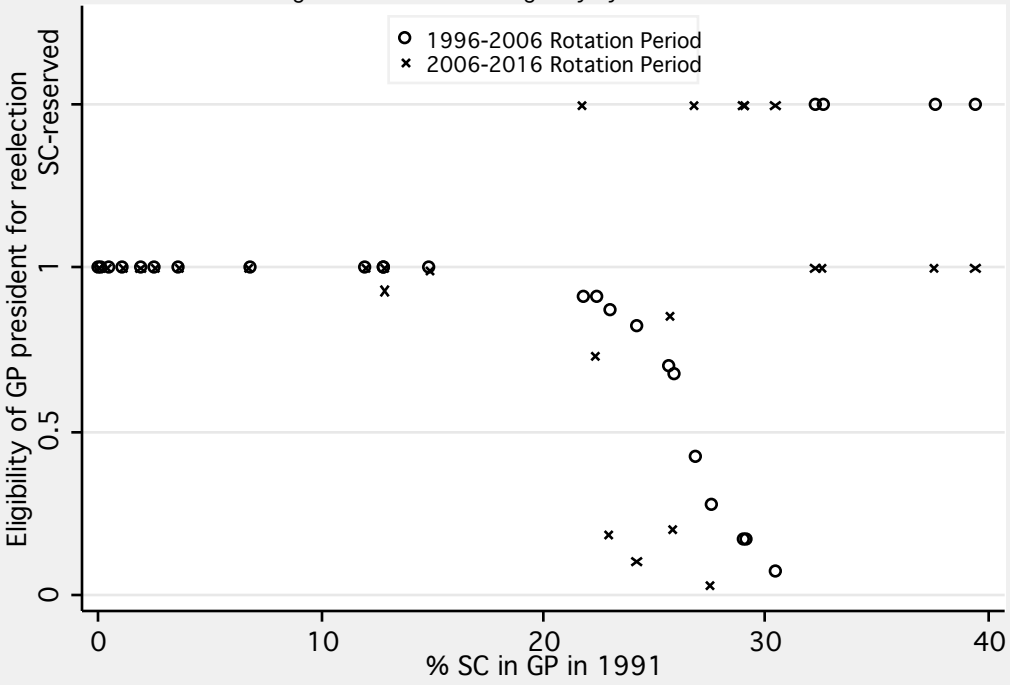

Figure 5: NREGS Usage by Age, Sex, Education

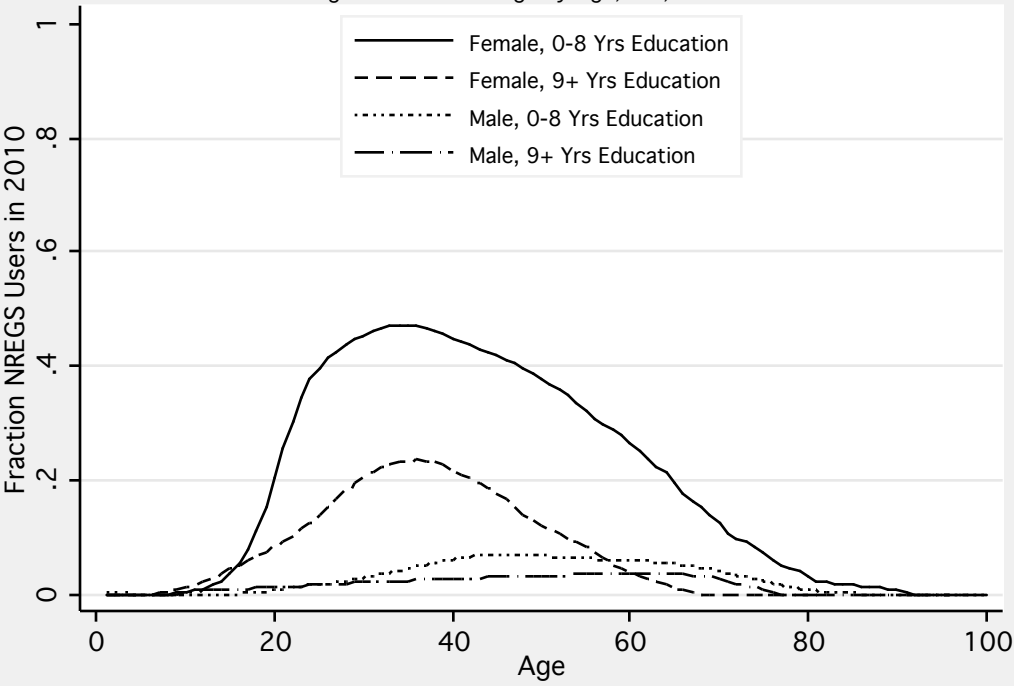

Figure 6: Valuation of NREGS and Housing Aid

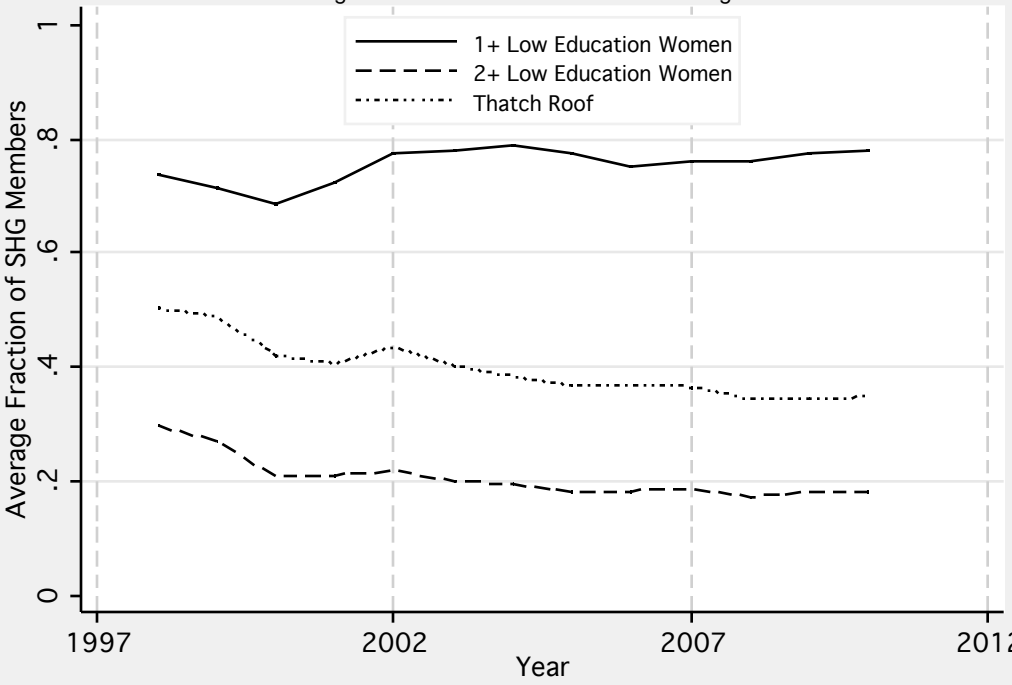

Figure 7: NREGS Use and Housing Aid

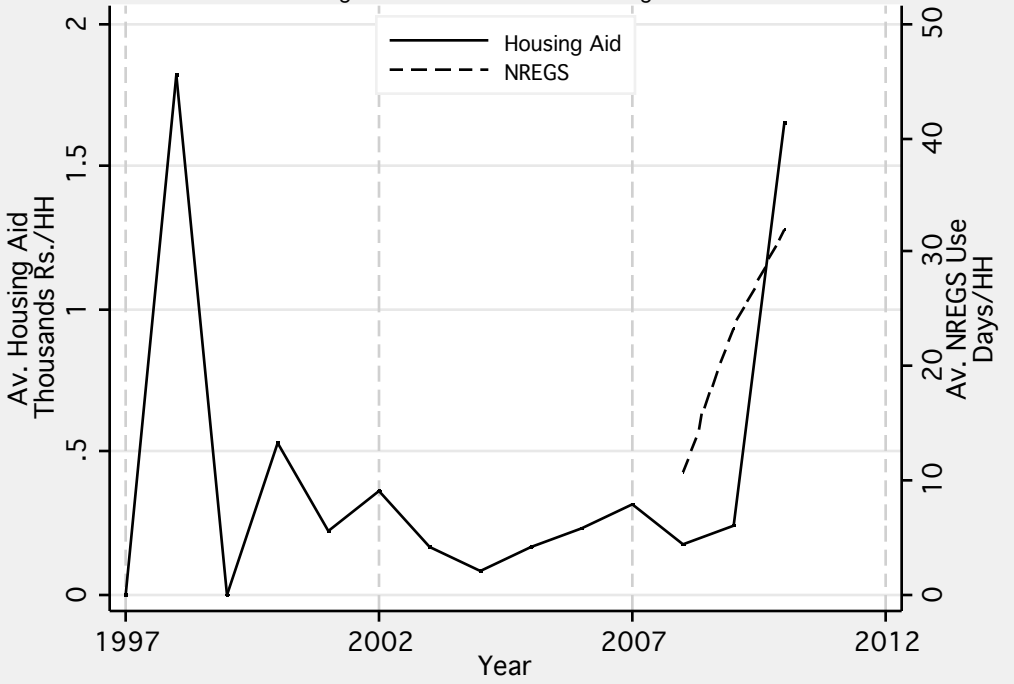

Figure 8: Political Support and Credit

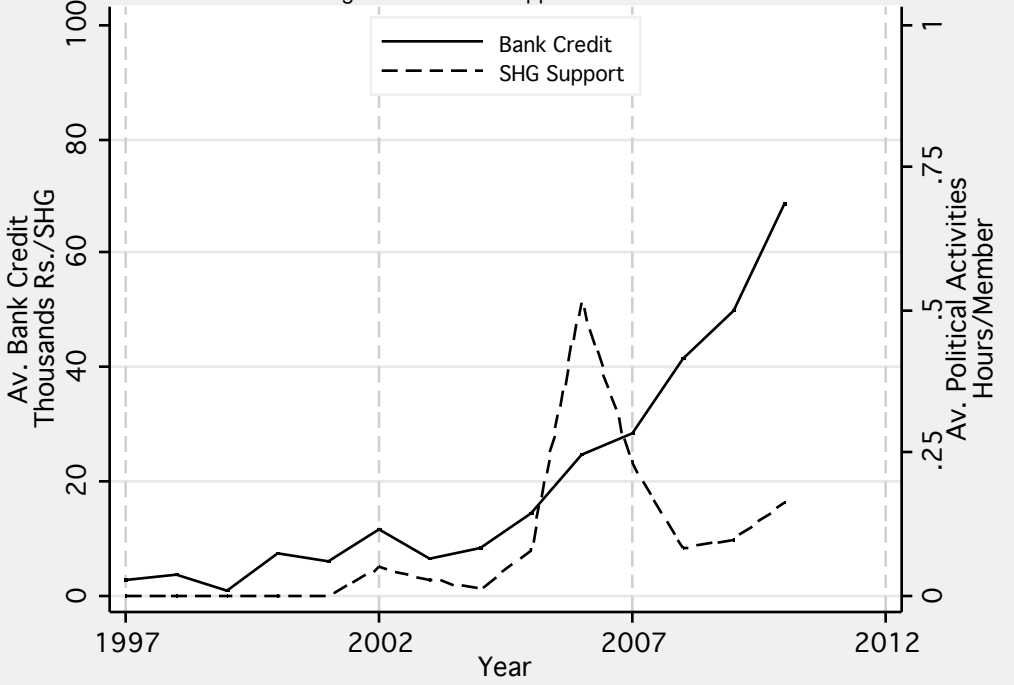

Table 1: Summary Statistics

Member characteristics	Mean	SD
Age	38.60	11.66
Education	6.11	4.35
Female	0.94	0.24
Fieldworker HH	0.42	0.49
SC	0.21	0.38
SHG size	15.20	3.42

Loan Characteristics	Mean	SD
Loans per year	0.36	0.58
Average loan size	97.48	99.07
Loan delinquency rate	0.04	0.18
Loan Usage	**Mean**	**SD**
Health Care	0.43	0.48
Education	0.59	0.48
Ceremonies	0.16	0.36
Business	0.50	0.49
Livestock	0.35	0.47
Agriculture	0.27	0.44
Housing	0.23	0.41
Repay other loans	0.03	0.17
Other	0.01	0.11

SHG member data from 2010.

"Fieldworker HH" indicates that the primary earner of the member's household is an unlanded agricultural worker.

Size is number of members in 2010

Loan size reported in Rs. thousands (Rs. 1000 is approximately US$22)

Loan delinquency indicates that a group reported making late or low payments or defaulting on the loan.

Loans were used for multiple purposes, so that loan usage does not sum to 1.

Table 2: Differences between SHGs in GPs with high and low E

Year:	2000			2005			2010		
Variable	GPs with E<0.5	GPs with E>0.5	t-stat	GPs with E<0.5	GPs with E>0.5	t-stat	GPs with E<0.5	GPs with E>0.5	t-stat
SHG size	14.88	14.20	0.57	15.41	15.85	-0.91	15.30	15.01	1.18
SHG age	1.65	1.35	0.71	2.25	1.72	1.58	3.99	3.83	0.57
SC	0.24	0.41	-2.03	0.44	0.29	2.95	0.32	0.18	4.00
Fieldworker HHs	0.33	0.47	-1.27	0.41	0.43	-0.30	0.44	0.41	1.20
Education	4.22	4.82	-0.70	5.78	5.24	1.36	6.25	6.16	0.38
Thatch roof huts	0.40	0.47	-0.52	0.33	0.38	-1.02	0.37	0.35	0.94
HHs with 1+ low education women	0.74	0.72	0.13	0.76	0.79	-0.64	0.79	0.78	0.50
HHs with 2+ low education women	0.15	0.25	-1.04	0.13	0.18	-1.47	0.19	0.18	0.46

"SHG size" is the number of members in the SHG.
"SHG age" is years since the SHG was formed.
"SC" is the fraction of SHG members which are SC.
"Fieldworker HHs" is the fraction of SHG members in households where the primary earner is an unlanded agricultural worker.
"Education" is the average years of education of SHG members.
"Thatch roof huts" is the fraction of SHG members living in thatch roof huts.
"HHs with 1+ low education women" is the fraction of SHG members living in households with one or more woman with 8 or less years of education.
"HHs with 2+ low education women" is the fraction of SHG members living in households with two or more woman with 8 or less years of education.

Table 3: Effect of NREGS Valuation and President Eligibility for Reelection on NREGS Usage, Political Support, and Credit Received, 2008-2010

Dependent variable:	NREGS Usage Days Per Member HH			Support to President Hrs. Per Member			Annual SHG Credit Rs. Thousands		
Subset:	SHG-Years 2008-2010								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
President Eligibility	19.73	22.20	22.41	0.22	0.24	0.24	53.80	57.69	56.74
X NREGS Valuation (2+)	(8.95)	(6.71)	(6.56)	(0.10)	(0.11)	(0.11)	(22.64)	(15.89)	(16.08)
NREGS Valuation (2+)	-4.34	-2.79	-2.72	-0.05	-0.08	-0.07	-23.39	-30.47	-29.84
	(4.43)	(3.68)	(3.57)	(0.02)	(0.04)	(0.04)	(12.55)	(10.99)	(11.52)
President Eligibility	5.06	-	-	0.06	-	-	15.67	-	-
	(7.33)	-	-	(0.05)	-	-	(17.31)	-	-
Year Fixed Effects	YES	YES	NO	YES	YES	NO	YES	YES	NO
GP Fixed Effects	NO	YES	NO	NO	YES	NO	NO	YES	NO
Year-GP Fixed Effects	NO	NO	YES	NO	NO	YES	NO	NO	YES
Adjusted R^2	0.41	0.56	0.58	0.05	0.06	0.06	0.23	0.30	0.30
Number of observations	1885	1885	1885	1885	1885	1885	1885	1885	1885
Number of clusters	22	22	22	22	22	22	22	22	22

Standard errors in parentheses are robust to heteroscedasticity and clustered residuals within each GP-rotation period.

"President Eligibility" is the simulated probability that the current GP president will be eligible for election in the next rotation period (2016-2026).

"NREGS Valuation (2+)" is the fraction of SHG members who live in households with two or more women with 8 or fewer years of education.

Table 4: Effect of Housing Aid Valuation and President Eligibility for Reelection on Housing Aid, Political Support, and Credit Received, 1997-2010

Dependent variable:	Housing Aid Rs. Thousands Per Member			Support to President Hrs. Per Member			Annual SHG Credit Rs. Thousands		
Subset:	SHG-Years 2008-2010								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
President Eligibility	1.43	1.25	1.19	0.03	0.01	0.04	10.26	20.92	15.53
X Housing Aid Valuation	(0.48)	(0.44)	(0.46)	(0.11)	(0.10)	(0.10)	(7.91)	(9.10)	(8.71)
Housing Aid Valuation	-0.89	-0.77	-0.73	0.01	0.05	0.02	-13.61	-17.48	-14.79
	(0.36)	(0.34)	(0.38)	(0.07)	(0.07)	(0.06)	(5.41)	(5.88)	(5.77)
President Eligibility	-0.32	-0.47	-	0.11	-0.20	-	11.84	21.48	-
	(0.30)	(0.40)	-	(0.06)	(0.11)	-	(11.12)	(12.94)	-
Year Fixed Effects	YES	YES	NO	YES	YES	NO	YES	YES	NO
GP Fixed Effects	NO	YES	NO	NO	YES	NO	NO	YES	NO
Year-GP Fixed Effects	NO	NO	YES	NO	NO	YES	NO	NO	YES
Adjusted R^2	0.07	0.08	0.11	0.00	0.02	-0.02	0.21	0.27	0.25
Number of observations	3710	3710	3710	3710	3710	3710	3710	3710	3710
Number of clusters	45	45	45	45	45	45	45	45	45

Standard errors in parentheses are robust to heteroscedasticity and clustered residuals within each GP-rotation period.

"President Eligibility" is the simulated probability that the current GP president will be eligible for election in the next rotation period (2006-2016 or 2016-2026).

"Housing Aid Valuation" is the fraction of SHG members who live in thatch-roof huts.

Table 5: Effect of NREGS Valuation and President Eligibility for Reelection on NREGS Usage, Political Support, and Credit Received, 2008-2010
Alternate Specifications

Dependent variable:	NREGS Usage Days Per Member HH		Support to President Hrs. Per Member		Annual SHG Credit Rs. Thousands	
Subset:	SHG-Years 2008-2010					
	(1)	(2)	(3)	(4)	(5)	(6)
President Eligibility	30.51	21.62	0.24	0.22	50.87	43.22
X NREGS Valuation (2+)	(7.37)	(7.48)	(0.15)	(0.11)	(15.31)	(12.32)
%SC in GP	70.4	-	0.01	-	-57.71	-
X NREGS Valuation (2+)	(41.68)	-	(0.63)	-	(68.68)	-
NREGS Valuation (2+)	-21.37	-6.76	-0.08	-0.05	-15.24	-16.43
	(11.41)	(4.63)	(0.18)	(0.05)	(20.38)	(8.21)
Year Fixed Effects	YES	YES	YES	YES	YES	YES
GP Fixed Effects	YES	YES	YES	YES	YES	YES
Additional Controls	NO	YES	NO	YES	NO	YES
Adjusted R^2	0.57	0.58	0.06	0.06	0.30	0.31
Number of observations	1885	1881	1885	1881	1885	1881
Number of clusters	22	22	22	22	22	22

Standard errors in parentheses are robust to heteroscedasticity and clustered residuals within each GP-rotation period.
"President Eligibility" is the simulated probability that the current GP president will be eligible for election in the next rotation period (2016-2026).
"NREGS Valuation (2+)" is the fraction of SHG members who live in households with two or more women with 8 or fewer years of education.
Controls include SHG size, fraction of members in fieldworker HHs, fraction of SC members, and fraction of members in HHs where earner has 12+ years of education.

Table 6: Effect of Housing Aid Valuation and President Eligibility for Reelection on Housing Aid, Political Support, and Credit Received, 1997-2010
Alternate Specifications

Dependent variable:	Housing Aid Rs. Thousands Per Member		Support to President Hrs. Per Member		Annual SHG Credit Rs. Thousands	
Subset:	SHG-Years 1997-2010					
	(1)	(2)	(3)	(4)	(5)	(6)
President Eligibility	1.69	1.24	-0.09	-0.04	10.07	19.22
X Housing Aid Valuation	(0.51)	(0.43)	(0.12)	(0.10)	(10.35)	(9.49)
%SC in GP	2.65	-	-0.57	-	-64.64	-
X Housing Aid Valuation	(1.72)	-	(0.5)	-	(37.18)	-
Housing Aid Valuation	-1.56	-0.89	0.22	0.09	1.88	-15.3
	(0.60)	(0.35)	(0.15)	(0.08)	(12.53)	(6.52)
President Eligibility	-0.66	-0.55	-0.15	-0.20	25.35	20.73
	(0.42)	(0.36)	(0.12)	(0.13)	(14.86)	(12.90)
%SC in GP	-1.34	-	0.67	-	1.34	-
	(2.23)	-	(1.36)	-	(228.60)	-
Year Fixed Effects	YES	YES	YES	YES	YES	YES
GP Fixed Effects	YES	YES	YES	YES	YES	YES
Additional Controls	NO	YES	NO	YES	NO	YES
Adjusted R^2	0.08	0.09	0.02	0.02	0.27	0.27
Number of observations	3710	3705	3710	3705	3710	3705
Number of clusters	45	45	45	45	45	45

Standard errors in parentheses are robust to heteroscedasticity and clustered residuals within each GP-rotation period.
"President Eligibility" is the simulated probability that the current GP president will be eligible for election in the next rotation period (2006-2016 or 2016-2026).
"Housing Aid Valuation" is the fraction of SHG members who live in thatch-roof huts.
Controls include SHG size, fraction of members in fieldworker HHs, fraction of SC members, and fraction of members in HHs where earner has 12+ years of education.

Table 7: Effect of NREGS Valuation and President Eligibility for Reelection on NREGS Usage, Political Support, and Credit Received, 2008-2010
Valuation Measured as 1+ Low Education Women

Dependent variable:	NREGS Usage Days Per Member HH			Support to President Hrs. Per Member			Annual SHG Credit Rs. Thousands		
Subset:	SHG-Years 2008-2010								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
President Eligibility	3.96	1.14	1.93	0.07	0.13	0.12	-19.52	10.62	8.77
X NREGS Valuation (1+)	(9.27)	(9.33)	(9.18)	(0.10)	(0.10)	(0.10)	(17.24)	(12.73)	(12.89)
NREGS Valuation (1+)	18.34	18.47	17.12	0.01	-0.02	-0.02	-4.67	-9.03	-8.14
	(6.86)	(5.89)	(5.87)	(0.08)	(0.07)	(0.08)	(10.71)	(8.97)	(9.14)
President Eligibility	5.81	-	-	0.04	-	-	40.47	-	-
	(8.07)	-	-	(0.05)	-	-	(22.15)	-	-
Year Fixed Effects	YES	YES	NO	YES	YES	NO	YES	YES	NO
GP Fixed Effects	NO	YES	NO	NO	YES	NO	NO	YES	NO
Year-GP Fixed Effects	NO	NO	YES	NO	NO	YES	NO	NO	YES
Adjusted R^2	0.43	0.57	0.59	0.05	0.06	0.05	0.23	0.30	0.30
Number of observations	1885	1885	1885	1885	1885	1885	1885	1885	1885
Number of clusters	22	22	22	22	22	22	22	22	22

Standard errors in parentheses are robust to heteroscedasticity and clustered residuals within each GP-rotation period.
"President Eligibility" is the simulated probability that the current GP president will be eligible for election in the next rotation period (2016-2026).
"NREGS Valuation (1+)" is the fraction of SHG members who live in households with one or more women with 8 or fewer years of education.

Table 8: Effect of Housing Aid Valuation, NREGS Valuation, and President Eligibility for Reelection on Loan Delinquency

Dependent variable:	Late Repayment, Low Repayment, or Default Indicator					
Subset:	SHG-Years with Lending			SHG-Years with Lending 2008-2010		
	(1)	(2)	(3)	(4)	(5)	(6)
President Eligibility	-	-	-	-0.07	-0.09	-0.09
X NREGS Valuation (2+)	-	-	-	(0.08)	(0.09)	(0.09)
President Eligibility	-0.04	-0.02	-0.02	-	-	-
X Housing Aid Valuation	(0.04)	(0.04)	(0.04)	-	-	-
NREGS Valuation (2+)	-	-	-	0.02	0.04	0.04
	-	-	-	(0.07)	(0.08)	(0.07)
Housing Aid Valuation	0.03	0.01	0.00	-	-	-
	(0.03)	(0.04)	(0.03)	-	-	-
President Eligibility	0.00	0.03	-	0.01	-	-
	(.02)	(0.03)	-	(0.02)	-	-
Year Fixed Effects	YES	YES	NO	YES	YES	NO
GP Fixed Effects	NO	YES	NO	NO	YES	NO
Year-GP Fixed Effects	NO	NO	YES	NO	NO	YES
Adjusted R^2	0.04	0.06	0.13	0.02	0.05	0.09
Number of observations	1216	1216	1216	752	752	752
Number of clusters	45	45	45	22	22	22

Standard errors in parentheses are robust to heteroscedasticity and clustered residuals within each GP-rotation period.

"President Eligibility" is the simulated probability that the current GP president will be eligible for election in the next rotation period (2006-2016 or 2016-2026).

"Housing Aid Valuation" is the fraction of SHG members who live in thatch-roof huts.

"NREGS Valuation (2+)" is the fraction of SHG members who live in households with two or more women with 8 or fewer years of education.

Table 9: Effect of NREGS Valuation and President Eligibility for Reelection on Political Support and Credit Received, 1997-2006

Dependent variable:	Support to President Hrs. Per Member			Annual SHG Credit Rs. Thousands		
Subset:	SHG-Years 1997-2006					
	(1)	(2)	(3)	(4)	(5)	(6)
President Eligibility	0.09	0.20	0.26	-14.06	-9.32	-8.81
X NREGS Valuation (2+)	(0.18)	(0.26)	(0.28)	(9.89)	(7.59)	(8.98)
NREGS Valuation (2+)	-0.11	-0.20	-0.28	11.36	7.26	6.05
	(0.13)	(0.20)	(0.24)	(9.64)	(6.66)	(7.51)
President Eligibility	0.18	-	-	6.18	-	-
	(0.10)	-	-	(4.45)	-	-
Year Fixed Effects	YES	YES	NO	YES	YES	NO
GP Fixed Effects	NO	YES	NO	NO	YES	NO
Year-GP Fixed Effects	NO	NO	YES	NO	NO	YES
Adjusted R^2	0.01	0.01	-0.11	0.12	0.15	0.10
Number of observations	1328	1328	1328	1328	1328	1328
Number of clusters	23	23	23	23	23	23

Standard errors in parentheses are robust to heteroscedasticity and clustered residuals within each GP-rotation period.
"President Eligibility" is the simulated probability that the current GP president will be eligible for election in the next rotation period (2006-2016).
"NREGS Valuation (2+)" is the fraction of SHG members who live in households with two or more women with 8 or fewer years of education.

Appendix Table A1: Effect of NREGS Valuation and President Eligibility for Reelection on NREGS Usage, Political Support, and Credit Received, 2008-2010, Alternate Eligibility

Dependent variable:	NREGS Usage Days Per Member HH			Support to President Hrs. Per Member			Annual SHG Credit Rs. Thousands		
Subset:	SHG-Years 2008-2010								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
President Eligibility > 50%	15.66	18.76	18.83	0.19	0.21	0.21	52.42	50.70	49.76
X NREGS Valuation (2+)	(7.09)	(5.20)	(5.12)	(0.07)	(0.08)	(0.08)	(18.30)	(13.47)	(13.74)
NREGS Valuation (2+)	-2.15	-0.66	-0.49	-0.04	-0.06	-0.06	-23.97	-26.31	-25.69
	(2.92)	(2.85)	(2.76)	(0.01)	(0.03)	(0.03)	(10.50)	(10.69)	(11.25)
President Eligibility > 50%	2.02	-	-	0.05	-	-	17.37	-	-
	(5.99)	-	-	(0.04)	-	-	(14.97)	-	-
Year Fixed Effects	YES	YES	NO	YES	YES	NO	YES	YES	NO
GP Fixed Effects	NO	YES	NO	NO	YES	NO	NO	YES	NO
Year-GP Fixed Effects	NO	NO	YES	NO	NO	YES	NO	NO	YES
Adjusted R^2	0.41	0.56	0.58	0.05	0.06	0.06	0.23	0.30	0.30
Number of observations	1885	1885	1885	1885	1885	1885	1885	1885	1885
Number of clusters	22	22	22	22	22	22	22	22	22

Standard errors in parentheses are robust to heteroscedasticity and clustered residuals within each GP-rotation period.

"President Eligibility > 50%" is an indicator for the president's simulated election eligibility probability in the next rotation period (2016-2026) being greater than 50%.

"NREGS Valuation (2+)" is the fraction of SHG members who live in households with two or more women with 8 or fewer years of education.

Appendix Table A2: Effect of Housing Aid Valuation and President Eligibility for Reelection on Housing Aid, Political Support, and Credit Received, 1997-2010, Alternate Eligibility

Dependent variable:	Housing Aid Rs. Thousands Per Member			Support to President Hrs. Per Member			Annual SHG Credit Rs. Thousands		
Subset:	SHG-Years 1997-2010								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
President Eligibility > 50%	0.93	0.83	0.77	0.03	0.03	0.05	10.10	16.20	11.65
X Housing Aid Valuation	(0.42)	(0.40)	(0.44)	(0.08)	(0.08)	(0.08)	(5.41)	(6.06)	(6.06)
Housing Aid Valuation	-0.51	-0.45	-0.41	0.01	0.03	0.02	-13.69	-13.98	-11.90
	(0.36)	(0.36)	(0.40)	(0.05)	(0.05)	(0.04)	(3.69)	(3.81)	(4.00)
President Eligibility > 50%	-0.22	-0.40	-	0.12	-0.10	-	12.94	10.00	-
	(0.24)	(0.30)	-	(0.04)	(0.07)	-	(9.53)	(7.28)	-
Year Fixed Effects	YES	YES	NO	YES	YES	NO	YES	YES	NO
GP Fixed Effects	NO	YES	NO	NO	YES	NO	NO	YES	NO
Year-GP Fixed Effects	NO	NO	YES	NO	NO	YES	NO	NO	YES
Adjusted R^2	0.07	0.08	0.11	0.00	0.02	-0.02	0.21	0.27	0.25
Number of observations	3710	3710	3710	3710	3710	3710	3710	3710	3710
Number of clusters	45	45	45	45	45	45	45	45	45

Standard errors in parentheses are robust to heteroscedasticity and clustered residuals within each GP-rotation period.
"President Eligibility > 50%" is an indicator for the president's simulated election eligibility probability in the next rotation period (2006-2016 or 2016-2026) being greater than 50%.
"Housing Aid Valuation" is the fraction of SHG members who live in thatch-roof huts.

Appendix Table A3: Effect of NREGS Valuation and President Eligibility for Reelection on NREGS Usage, Political Support, and Credit Received, 2008-2010, SC Clusters Included

Dependent variable:	NREGS Usage Days Per Member HH			Support to President Hrs. Per Member			Annual SHG Credit Rs. Thousands		
Subset:	SHG-Years 2008-2010								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
President Eligibility	18.57	21.74	21.74	0.19	0.20	0.20	57.72	57.02	55.81
X NREGS Valuation (2+)	(8.15)	(6.50)	(6.42)	(0.08)	(0.10)	(0.10)	(21.46)	(15.20)	(15.23)
NREGS Valuation (2+)	-4.13	-2.71	-2.59	-0.04	-0.07	-0.07	-24.08	-30.31	-29.67
	(4.34)	(3.64)	(3.52)	(0.02)	(0.04)	(0.04)	(12.35)	(11.03)	(11.48)
President Eligibility	6.46	-	-	0.05	-	-	8.44	-	-
	(6.37)	-	-	(0.04)	-	-	(15.4)	-	-
Year Fixed Effects	YES	YES	NO	YES	YES	NO	YES	YES	NO
GP Fixed Effects	NO	YES	NO	NO	YES	NO	NO	YES	NO
Year-GP Fixed Effects	NO	NO	YES	NO	NO	YES	NO	NO	YES
Adjusted R^2	0.43	0.57	0.58	0.05	0.06	0.05	0.22	0.29	0.29
Number of observations	2133	2133	2133	2133	2133	2133	2133	2133	2133
Number of clusters	27	27	27	27	27	27	27	27	27

Standard errors in parentheses are robust to heteroscedasticity and clustered residuals within each GP-rotation period.

"President Eligibility" is the simulated probability that the current GP president will be eligible for election in the next rotation period (2016-2026).

"NREGS Valuation (2+)" is the fraction of SHG members who live in households with two or more women with 8 or fewer years of education.

Appendix Table A4: Effect of Housing Aid Valuation and President Eligibility for Reelection on Housing Aid, Political Support, and Credit Received, 1997-2010, SC Clusters Included

Dependent variable:	Housing Aid Rs. Thousands Per Member			Support to President Hrs. Per Member			Annual SHG Credit Rs. Thousands		
Subset:	SHG-Years 1997-2010								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
President Eligibility	1.41	1.26	1.21	0.07	0.04	0.07	12.67	20.96	15.93
X Housing Aid Valuation	(0.47)	(0.44)	(0.47)	(0.10)	(0.10)	(0.10)	(6.86)	(8.13)	(7.70)
Housing Aid Valuation	-0.89	-0.75	-0.74	0.00	0.03	0.02	-13.96	-18.06	-14.90
	(0.36)	(0.34)	(0.38)	(0.07)	(0.07)	(0.06)	(5.31)	(5.81)	(5.67)
President Eligibility	-0.30	-0.13	-	0.08	0.00	-	5.54	-2.37	-
	(0.29)	(0.25)	-	(0.05)	(0.06)	-	(9.74)	(5.44)	-
Year Fixed Effects	YES	YES	NO	YES	YES	NO	YES	YES	NO
GP Fixed Effects	NO	YES	NO	NO	YES	NO	NO	YES	NO
Year-GP Fixed Effects	NO	NO	YES	NO	NO	YES	NO	NO	YES
Adjusted R^2	0.07	0.08	0.09	0.00	0.02	-0.02	0.20	0.26	0.24
Number of observations	4293	4293	4293	4293	4293	4293	4293	4293	4293
Number of clusters	54	54	54	54	54	54	54	54	54

Standard errors in parentheses are robust to heteroscedasticity and clustered residuals within each GP-rotation period.

"President Eligibility" is the simulated probability that the current GP president will be eligible for election in the next rotation period (2006-2016 or 2016-2026).

"Housing Aid Valuation" is the fraction of SHG members who live in thatch-roof huts.