Electoral Rules and Political Selection: Theory and Evidence from a Field Experiment in Afghanistan

ANDREW BEATH

World Bank

FOTINI CHRISTIA

Department of Political Science, Massachusetts Institute of Technology

GEORGY EGOROV

Kellogg School of Management, Northwestern University, and NBER

and

RUBEN ENIKOLOPOV

ICREA–IPEG, UPF, Barcelona GSE, and New Economic School

Voters commonly face a choice between competent candidates and those with policy preferences similar to their own. This article explores how electoral rules, such as district magnitude, mediate this trade-off and affect the composition of representative bodies and the quality of policy outcomes. We show formally that anticipation of bargaining over policy causes voters in elections with multiple single-member districts to prefer candidates with polarized policy positions over more competent candidates. Results from a unique field experiment in Afghanistan are consistent with these predictions. Specifically, representatives selected by elections with a single multi-member district are better educated and exhibit less extreme policy preferences.

Key words: Electoral rules, Political selection, District magnitude, Quality of politicians, Competence, Polarization, Local public goods, Legislative bargaining, Field experiment, Afghanistan

JEL Codes: D72, D78

1. INTRODUCTION

Ideally, elections for representative bodies result in the selection of those candidates that both perfectly represent the preferences of the electorate and design effective policies. In the real world, however, candidates with the qualities necessary to design effective policies are scarce. As a result, voters face a trade-off between voting for candidates with policy positions closest to their own and candidates who are more capable of designing effective policies. How voters

choose between these two kinds of candidates impacts the composition of representative bodies and, by extension, the representativeness and quality of public policy. While the trade-off between well-qualified candidates and candidates with agreeable policy positions is familiar to almost all who have voted, there is less appreciation the role of electoral rules in mediating this trade-off and thereby producing differences in the composition of representative bodies and in the quality of public policy.

This article seeks to identify the effects of differences in electoral systems—and district magnitude in particular—on voter behaviour, political selection, and policy outcomes. While numerous studies have posited links between electoral rules and policy outcomes (Cox, 1997; Persson and Tabellini, 2000, 2005; Norris, 2004), explorations of the intermediate effects of voter incentives, political selection, and the qualities of elected representatives have been limited.[1] Moreover, difficulties in identifying exogenous sources of variation in electoral systems have generally precluded causal inference. This article overcomes these two issues, making a theoretical and empirical contribution to the understanding of the effects of differences in electoral rules and policy outcomes. Specifically, the article combines models of voter choice and legislative bargaining to generate predictions of how differences in district magnitude affect political selection and policy outcomes. These predictions are then tested using data from a unique experiment that induced randomized variation in electoral rules for local council elections across 250 villages in Afghanistan.

The article focuses on two alternate and commonly used electoral rules: the district election system and the at-large election system. District elections, which are used to elect the U.S. House of Representatives and the British House of Commons, are "single-winner systems" whereby successful candidates must attain at least a plurality of votes cast in their assigned electorate. District elections necessitate the division of the area to be represented into multiple geographic constituencies, with voters confined to casting votes for candidates competing to represent the voter's constituency. At-large elections systems, which are a common means by which parliaments are elected in continental Europe, broaden the scope of the constituency over which candidates are elected. As a result, multiple candidates are elected by each constituency. In the extreme, an at-large election may contain a single constituency spanning the area represented by the particular body (*e.g.* an entire country in the case of a national parliament).

The theoretical model developed in the article examines how these two different electoral rules affect the composition of a village council. The model considers a linear village with a uniform distribution of villagers. The location of a villager's home corresponds to her ideal point for the location of a public good (*e.g.* a drinking well). The location of the public good is decided by a two-member council, elected by village residents, through a bargaining process. Under at-large elections, each resident has two votes and can vote for any two candidates.[2] Under district elections, the village is split into two geographically defined districts and each citizen can only vote for a candidate residing in the same district. The number of residents capable of making effective policy decisions is assumed to be small and voters thereby trade-off candidates' policy

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1. The importance of political selection, though emphasized as equally important as political accountability as early as the Federalist papers (Madison, 1961[1788]), has been largely "neglected" (Besley, 2005, p. 44). The works by Myerson (1993), Galasso and Nannicini (2014), and Hirano and Snyder (2014) provide a notable exception in that they examine the effect of electoral rules on the quality of politicians. A number of other papers consider various aspects of the quality of politicians not related to electoral rules (these include Fearon, 1999; Besley *et al*., 2005; Besley, 2006; Ashworth and de Mesquita, 2008; Alt *et al*., 2011; as well as papers referenced below in Sections 1 and 4).

2. This is in-line with Cox (1984), who was the first to study double-member districts formally. The key difference is that in Cox (1984) voters vote sincerely and candidates choose positions strategically. In this article, voters are strategic, but candidates' positions are fixed and tied to their location of residence.

preferences with candidates' competence.[3] The model predicts that in district elections, voters prefer candidates with more extreme policy preferences over more competent candidates, as they expect such candidates to achieve a better outcome in the bargaining game with candidates elected from other districts. In at-large elections, these strategic considerations are less pronounced, so voters are more willing to elect competent candidates. The difference between the two electoral systems is magnified in villages with more heterogeneous policy preferences.

The predictions of the theoretical model are tested with data from a field experiment covering 250 villages across Afghanistan. The experiment induced randomized variation in the electoral rules governing the composition of village councils that were mandated to make decisions on the type and location of a package of local public goods. Of the 250 villages, 125 were randomly selected to compose councils by district elections. Per this procedure, each village was divided into several single-member districts, with candidates elected from each district separately and exclusively by villagers residing in that same district. The other 125 villages were assigned to at-large elections. Per this procedure, each village constituted one multi-member district, with villagers facing no restriction on which candidates in the village they could vote for. Council members were accordingly elected based on the number of votes garnered across the whole village. Under both electoral rules, all villagers were automatically considered candidates.

The results of the field experiment are consistent with the predictions of the theoretical model. Specifically, we find that at-large elections result in the election of more competent council members, as proxied by their level of education.[4] The effect is strong in heterogeneous villages (as measured by the divergence of villagers' *ex ante* policy preferences, the geographic size of villages, and ethnic composition) and is absent in homogenous villages. We also find evidence that district elections result in the election of council members with more biased preferences over the location of local public goods, as proxied by the location of their houses. We show that the results are not consistent with a number of alternative explanations, such as restrictions on the number of qualified candidates that can be elected from the same district or differences in incumbency advantage.

This article contributes to an extensive literature analysing the effects of electoral systems in general and district magnitude in particular. Previous studies have observed that the number of candidates increases with district magnitude (Duverger, 1954; Cox, 1997; Norris, 2004) and that proportional representation, which is characterized by high district magnitude, is more favourable to minorities (Lijphart, 2004), although this effect depends on the geographic concentration of minorities (Moser, 2008), their social status (Moser and Scheiner, 2012), as well as the size of the minority (Trebbi *et al.*, 2007). Studies generally find that single-member district systems result in better representation of geographically concentrated interests, with high-threshold proportional representation systems favouring geographically dispersed interests (Ferree *et al.*, 2013).[5]

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3. In a richer model, voters would face other trade-offs as well. For example, van Richard (2013) demonstrates a trade-off between aggregating preferences (choosing politicians with median voter preferences) and providing them with incentives to exert effort. There, the median voter prefers politicians with biased preferences, because they can be effectively punished without hurting the median voter by electing their polar opposites. Our focus is purely on political selection.

4. Education as a proxy for the quality of politicians has been previously used in Besley *et al.* (2005), Galasso and Nannicini (2011), Gagliarducci and Nannicini (2013), Folke *et al.* (2014).

5. Persson and Tabellini (1999, 2000) and Persson *et al.* (2003) argue that proportional systems with high district magnitude lead to higher levels of political rent extraction. Such systems also favour bigger governments and higher levels of redistribution (Persson and Tabellini, 2004; Iversen and Soskice, 2006). Other works that look at the effect of electoral rules on the composition of government spending include Lizzeri and Persico (2001) and Milesi-Ferretti *et al.* (2002).

There has been extensive theoretical investigation of the determinants of the capability of elected representatives and government agents (McKelvey and Reizman, 1992; Banks and Sundaram, 1998; Aragones and Palfrey, 2004; Caselli and Morelli, 2004; Acemoglu *et al*., 2010; Egorov and Sonin, 2011; Iaryczower and Mattozzi, 2013; Krasa and Polborn, 2015; Mattozzi and Merlo, 2015). Empirical investigations have tried to disentangle accountability and competence in elections (Alt *et al*., 2011), and have further established links between more capable elected officials and higher intra-party competition (Besley *et al*., 2013; Folke *et al*., 2014), higher inter-party competition (Banerjee and Pande, 2007), higher wages (Ferraz and Finan, 2011a; Kotakorpi and Poutvaara, 2011; Dal *et al*., 2013; Gagliarducci and Nannicini, 2013), smaller budgets (Brollo *et al*., 2013), and more democratic institutions (Besley and Reynal-Querol, 2011). However, only Myerson (1993) considers how the quality of elected representatives is affected by the type of electoral system, arguing that, when voting is strategic, small district magnitude increases the barriers to candidate entry, which has a negative effect on the capability of canditates.[6]

To the best of our knowledge, this article is the first to provide experimental evidence on the causal effects of electoral rules.[7] However, as with much other experimental work, internal validity is achieved within a specific setting, which raises the issue of external validity. We argue that this study's conclusions could have broad applicability, as the trade-off described in the theoretical model is general and the predictions of the model are potentially applicable to other representative bodies, local, regional, and national, across the world.[8] Moreover, in contrast to many field experiments conducted in a single region of a country, the 250 villages that form the sample are drawn from five diverse regions of Afghanistan that span numerous ethnicities, levels of social capital, economic structures, and openness to democratic practices. Field experiments in Afghanistan have already been used in the literature to study corruption (Callen and Long, 2015), determinants of risk preferences (Callen *et al*., 2014), the effect of school construction (Burde and Linden, 2013), and women's empowerment (Beath *et al*., 2013a).[9] The study's empirical context also has some particular institutional features (such as the bundling of district magnitude with the number of votes cast for individual candidates; absence of parties and party lists; the preclusion of electoral campaigning; and universal candidacy [*i.e.*, any villager can vote for any other villager]) that constrain external validity. However, these features also allow for the identification of the effects of electoral rules on political selection in a more precise manner than would be possible in a more complex political system.

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6. See also Adams (1996), who considers the effect of a constitutional change in Illinois in 1980 on business friendliness of state legislators, and Hirano and Snyder (2014) who look at the effect of primaries on the quality of candidates.

7. A number of papers use quasi-experimental methods to compare majoritarian and proportional elections, such as a difference-in-differences strategy (Funk and Gathmann, 2013) and a regression discontinuity design (Gagliarducci *et al*., 2011; Eggers, 2015). Other studies with quasi-experimental designs that study causal effects of elections include, among others, Alt *et al*. (2011), Ferraz and Finan (2011a), and Hainmueller, Hall and Snyder (2015).

8. For example, in the U.S. context, our model would suggest that the electoral success of the Tea Party movement in Republican primaries and general elections in 2010–2012 need not imply that voters became biased to the right or more polarized. Instead, following the global financial crisis, deficit spending increased, and the salience of taxation increased. In this context, voters who are only moderately averse to deficit spending may have decided to elect representatives who are extremely averse to increasing the deficit, anticipating that their more extreme position will lead, in equilibrium, to a more favourable compromise, such as lower deficits. Though always present, this effect became more pronounced as the salience of the issue increased. This interpretation is consistent with findings in Ansolabehere *et al*. (2006) and suggests that in the past three decades there has been growing polarization of politicians despite stable electorate preferences.

9. Other works that focus on a specific context include Olken (2007), Barron and Olken (2009), and Martinez-Bravo (2014a) on Indonesia; Ferraz and Finan (2008, 2011a) on Brazil; Dell (2012) on Peru; Casey *et al*. (2012) and Acemoglu *et al*. (2014) on Sierra Leone, among others.

The rest of the article is organized as follows: Section 2 presents the experimental design; Section 3 describes the theoretical model; Section 4 formulates empirical predictions from the model; Section 5 describes the data; Section 6 details the empirical results; Section 7 discusses the empirical and theoretical findings; and Section 8 concludes. The article contains three Online Appendices: Supplementary Appendix A presents extensions of the baseline model and explores the robustness of its predictions; Supplementary Appendix B lays out all the proofs; and Supplementary Appendix C offers additional empirical results.

2. EXPERIMENTAL DESIGN

We examine the effect of electoral rules on the quality of elected officials using a field experiment which randomized variation in the method of council elections across 250 villages in Afghanistan. This intervention was part of an impact evaluation of the National Solidarity Programme (NSP) that also randomized the assignment of project selection procedures (Beath *et al*., 2013b) and the programme itself (Beath *et al*., 2015a, 2013a). This section provides further details on NSP (Section 2.1), describes the variation in electoral rules induced across the 250 villages (Section 2.3), details the sample and randomization procedures (Section 2.4), and discusses the timing of the intervention and the data collection process (Section 2.5).

2.1. *National Solidarity Programme*

NSP was devised in 2002 by the Government of Afghanistan to deliver services and infrastructure to the country's rural population and build representative institutions for village governance. NSP has been implemented in over 32,000 villages in all of Afghanistan's 34 provinces and has disbursed over $1.1 billion, making it the largest development programme in Afghanistan. The programme is structured around two interventions: (1) the creation of an elected Community Development Council (hereafter, "council"); and (2) the disbursement of block grants to councils for implementation of village projects. The programme is executed by the Ministry of Rural Rehabilitation and Development, facilitated by contracted NGOs, and funded by bilateral and multilateral donors.

NSP mandates the creation of gender-balanced village development councils through a secret-ballot, universal suffrage election.[10] Once councils are formed, NSP disburses block grants valued at $200 per household, up to a village maximum of $60,000, to fund local development projects,[11] with villages required to contribute at least 10% of project costs, which they largely do in the form of labour. Projects are selected by the council in consultation with the village community and are ordinarily focused on either the construction or rehabilitation of infrastructure, such as drinking water facilities, irrigation canals, roads and bridges, or electrical generators; or the provision of human capital development, such as training and literacy courses.

Overall, the main task of the elected council members is to guide the choice of development projects and then oversee project implementation. In particular, they are responsible for compiling the list of candidate projects;[12] preparing budgets for the proposed projects for the approval of

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10. Note that this is the first time that the population is participating in a local election. Prior to that, villages in Afghanistan had only customary local governance structures (Beath *et al*., 2015c).

11. The average block grant in the sample villages was approximately $31,000.

12. The projects were selected either through a secret-ballot referendum or at a village meeting. In either case, the village council was responsible for preparing a list of proposed projects and for implementing the selected project (see Beath *et al*. 2015b, for more information). The project selection procedure assigned to a village was known to the NGOs, but we do not know whether this information was transmitted to the villagers prior to the elections. We check and confirm

the central NSP office in Kabul; and implementing projects (including selecting the relevant contractors and designating the labourers that will work on each project).

NSP aspires to provide repeat block grants to participating villages, although villages receive no firm guarantees of when—or if—they will receive these. The process for conducting follow-up elections for the council is also uncertain. Per NSP rules, villages are supposed to hold re-elections for council positions every 4 years, but since follow-up elections are not facilitated, it is unclear whether these actually occur.[13]

2.2. *Local governance in Afghanistan*

Afghanistan's central government has historically lacked the resources to exercise local control or provide public goods in many parts of the country. As a result, local communities developed customary structures of governance and accountability (Barfield, 1984). The foundation of governance in rural Afghanistan is the local *jirga* or *shura*, a participatory council that has traditionally managed local public goods and adjudicated disputes (Nojumi *et al*., 2004). *Shura* or *jirga* members tend to be the elders of the village (Rahmani, 2006), although membership is ordinarily not fixed. *Shuras* or *jirgas* generally convene when there is an issue to resolve and reach decisions based on consensus (Boesen, 2004). In addition to *shuras* or *jirgas*, villages ordinarily have a headman (termed a *malik*, *arbab*, or *qariyadar*)—usually a large landowner—-who serves as a liaison between the village and the central government (Kakar, 2005). Traditional leadership in rural Afghanistan consists almost exclusively of males, as the principle of *purdah*—which stipulates that women should generally be hidden from public observation—precludes female involvement in communal gatherings and local governance.

The elected development councils established by NSP differ from customary governance institutions in the mode of selection and the respective accountability structure. While the elected development councils are composed by a secret ballot, universal suffrage election, the position of headman is ordinarily inherited or otherwise derived on account of land holdings or other forms of economic authority. Although there is no formal assignment of local governance functions to elected development councils apart from managing NSP-funded projects, their authority in selecting, implementing, and managing these projects provides them with control over what is for many villages an unprecedented volume of resources. Thus, the elected development council exists in parallel with customary governance structures, but is vested with substantial *de facto* and *de jure* authority.

2.3. *Electoral rules*

Every village resident, whether male or female, who is aged eighteen or older and who has lived in the village for at least 1 year was eligible to vote and be elected to the council. NSP rules required that at least 60% of eligible voters must cast votes in the election for it to be valid. All eligible villagers were considered candidates and people voted by writing-in the name(s) of their preferred candidates.[14] Villagers interested in being elected to the council were prohibited

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that there are no statistically significant differences on the effect of electoral rules between villages with different project selection procedures.

    13. No such re-elections had occurred by early 2012, when the data collection for this evaluation was completed.

    14. Illiterate villagers could ask NGO workers to write the name for them. This arrangement could potentially violate the secrecy of the vote. However, the results of election monitoring (see below) indicate that 95% of voters were confident that their vote would remain secret.

from campaigning for the position.[15] The council had to contain an equal number of male and female members, with the total council size varying by village size. All villages in the sample were segmented into geographically contiguous districts containing between five and twenty-five families, with each district having its own polling station. A village map with districts and enclosed dwellings was displayed in a public area in the village.

Council elections were conducted by secret ballot according to one of two sets of electoral rules that differ primarily in district magnitude:[16]

District Election: Voters were restricted to casting a ballot for a single candidate, who had to reside in the same district as the voter. In each district, the one male and the one female with the largest number of votes were elected to the council as representatives of their district. Thus, this method represents a single member, simple plurality election with multiple districts (Cox, 1997), similar to the first-past-the-post system.

At-large Election: Under this method, voters could cast their ballot for anyone residing in the village. The men and women receiving the most votes across the village were elected as council members. Voters could cast ballots for a maximum of three different people, who were not ranked.[17] The at-large election method represents a multi-member election under a plurality rule with a single district and multiple non-transferable votes. The two main differences from district elections are: (1) higher district magnitude (multiple elected members instead of one) and (2) number of votes cast (three instead of one).

In all villages, council elections were administered by "social organizers" employed by the NGO contracted to facilitate NSP in the district. Monitoring results from a randomly selected set of sixty-five villages that held district elections and sixty-six villages that held at-large elections (including data from the monitors' 784 polling station reports and interviews administered to 1,675 male voters) indicate that election procedures were professionally executed by the contracted NGOs and that villagers exhibited a good understanding of the different electoral rules.[18] Monitoring results confirm high levels of compliance with the assigned treatment status.

2.4. *Sample and randomization*

Electoral rules were randomized across 250 villages that formed the treatment group for the randomized impact evaluation of NSP and which were assigned to receive NSP. The villages are evenly split across ten administrative districts in northern, northeastern, eastern, central, and western Afghanistan (Figure 1). Despite the necessary exclusion of southern areas from the sample due to security concerns, the ten districts are broadly representative of Afghanistan's ethnolinguistic diversity, with five predominantly Tajik districts, four predominantly Pashtun districts, one predominantly Hazara district, and two districts with significant populations of Uzbek and Turkmen minorities.

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15. The NGOs that implemented the elections claim that this campaign ban was enforced and we do not have any evidence to the contrary. However, pre-existing elites would be likely to be more readily considered for these positions and would also have the opportunity for informal campaigning through their denser networks of acquaintances in the village.

16. A detailed guide on the procedures is available at http://www.nsp-ie.org/sti.html.

17. This means the system allows for plumping, but not cummulation (Cox, 1997). Participating NGOs requested the casting of up to three votes in at-large elections as they considered it a high probability that if villagers were accorded only one vote in at-large elections, the number of candidates receiving votes would be fewer than the number of council seats, thereby necessitating multiple rounds of voting.

18. A detailed description of the monitoring results can be found at http://www.nsp-ie.org/reports/CDCE-MR.pdf

FIGURE 1
Ten sample districts

The average population in our sample of villages is roughly 1,000 people (see Table 1). There is notable variation in the geographic size of villages, with quite a few villages spanning several kilometres. The average distance between the house of a randomly selected survey respondent and the centre of the village is about 400 m, with a standard deviation of more than 1 km. About 25% of villages are ethnically mixed, with the rest being exclusively Pashtun, Tajik, or Hazara (as well as one Turkmen village). The average level of education in the sampled villages is very low, with more than 70% of adult male villagers having no formal education and only 4% having finished high school. An average household consists of ten people, of which about five are children under the age of fifteen. The sample villages are also very poor: only 45% of respondents indicate that they never or rarely have problems supplying food for their families.[19]

Random assignment of electoral rules was made concurrently with the assignment of project selection procedures. Specifically, twenty-five treatment villages in each district were paired to minimize differences in background characteristics within each pair (leaving one village unpaired) and then matched in pairs of pairs to form quadruples.[20] Unpaired villages across districts were also grouped into two quadruples (leaving two villages unmatched). Each village

19. An assessment of the demographic and economic characteristics of the sample villages reveals few substantive differences with those of a random sample of Afghan villages surveyed by the 2007–08 National Risk and Vulnerability Assessment. See Beath *et al*. (2013b) for more details.

20. The full list of variables employed in the matching procedure consists of village size (based on data collected by Afghanistan's Central Statistics Office) and a set of geographic variables (distance to river, distance to major road, altitude, and average slope). Pairs of pairs were formed by performing the same matching procedure treating each pair as a single village with background characteristics that equal the average of the respective characteristics of the two villages in a pair. Randomization was performed after the baseline survey was conducted, but before it was processed, so this information was not included in the matching procedure.

TABLE 1
Balance of pre-treatment Covariates

	Mean (full sample)	Standard deviation (full sample)	Observation	Mean in district villages	Mean in at-large villages	Standardized difference	t-statistics for equality of means
Number of households in village	119.94	122.77	2356	126.12	113.66	0.10	0.94
Household members	9.76	5.00	2473	9.54	9.98	0.09	1.22
Household members under 15 years	4.58	2.76	2473	4.50	4.65	0.06	0.85
Distance in metres from respondent's house to village centre	403.55	1017.93	2170	363.34	445.19	0.08	1.49
Primary source of household income is agriculture	0.66	0.48	2458	0.67	0.64	0.05	0.82
Age of male head-of-household respondent	43.77	13.31	2433	43.97	43.57	0.03	0.64
Male head-of-household respondent has no formal education	0.71	0.45	2486	0.73	0.69	0.09	1.47
Male head-of-household respondent finished middle school	0.07	0.26	2486	0.07	0.08	0.02	0.33
Male head-of-household respondent finished high school	0.04	0.20	2486	0.04	0.05	0.03	0.55
First language of male head-of-household respondent is Dari	0.70	0.46	2486	0.72	0.69	0.07	0.59
Household never or rarely faces food shortages	0.45	0.50	2486	0.43	0.48	0.10	1.49
Household's main source of drinking water is unprotected spring	0.27	0.44	2486	0.28	0.26	0.03	0.28
Household has access to electricity	0.15	0.36	2486	0.14	0.16	0.05	0.48
Household has a mobile phone	0.17	0.38	2486	0.18	0.17	0.03	0.39
Household has a radio	0.75	0.43	2486	0.74	0.77	0.07	1.10
Household expenditure on food in last 30 days (Afghani)	3566.46	1977.76	2439	3509.73	3623.71	0.06	0.72
Household received loan in past 12 months	0.47	0.50	2486	0.49	0.45	0.09	1.13
Most preferred project of male respondents is drinking water	0.29	0.45	2486	0.31	0.28	0.06	0.77
Most preferred project of male respondents is irrigation	0.13	0.34	2486	0.11	0.15	0.12	1.70
Most preferred project of male respondents is electricity	0.06	0.24	2486	0.07	0.06	0.03	0.46
Most preferred project of male respondents is road or bridge	0.15	0.36	2486	0.16	0.14	0.05	0.73
Male head-of-household respondent attends *Shura* meetings	0.31	0.46	2486	0.33	0.30	0.06	0.87
Village is ethnically mixed	0.24	0.43	250	0.21	0.26	0.13	1.04

Note: Standardized difference reflects difference in means between district and at-large villages, divided by the standard deviation of district villages. *t*-statistics adjusted for clustering at the village level.

within the quadruple (and the two unmatched villages) was then randomly assigned one of the four combinations of council election rules and project selection procedures.

This assignment procedure, which essentially represents randomization with stratification by quadruples, ensures that each village in the sample had an equal probability of being assigned to each of the two electoral rules and that this assignment was orthogonal to the assignment of project selection procedures. To account for stratification at the randomization stage, we include quadruple fixed effects in the empirical analysis (Bruhn and McKenzie, 2009).

The randomization resulted in a well-balanced set of villages. Table 1 presents a comparison between the two groups of villages with regard to a number of pre-intervention characteristics, which shows that the differences between the two groups never exceed 13% of a standard deviation.

2.5. *Phasing of intervention and data collection*

The baseline survey was administered in September 2007, prior to the randomization of election procedures. Council elections occurred between October 2007 and May 2008. Elections in 131 out of 250 villages were monitored by agents of the research team. Project selection occurred between November 2007 and August 2008 and project implementation occurred between April 2008 and September 2011. A first follow-up survey (midline) was conducted between May and October of 2009. A second follow-up survey (endline) was conducted between May and October of 2011, at which time 99% of projects funded by NSP were complete.

3. THEORY

In this section, we introduce a simple model of elections where competent candidates are rare in order to study voters' choice between electing the most competent candidate versus voting for someone whose political positions they share. The model is deliberately simple (*e.g.* we make some extreme assumptions such as perfect political segregation and that only one candidate in the village is competent), but in Supplementary Appendix A we consider multiple extensions on how electoral rules can affect the competence and political positions of elected candidates and show that our main findings are robust. Some features of the model, such as absence of entry costs for candidates or the absence of parties, were inspired by the specific setting of the experiment; we discuss the generality of these assumptions in Section 8.

3.1. *Setup*

The society consists of a continuum of individuals distributed uniformly on a compact $S = [-B, B]$. The policy space that these agents care about coincides with the set S.[21] We assume that if policy $p \in S$ is enacted, then an individual with bliss point $b \in S$ gets the baseline utility $u(p, b)$, which we assume, for simplicity, to be quadratic

$$u(p, b) = -k(p - b)^2,$$

where $k > 0$ measures the importance of the policy issue to the society.

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21. The model could represent a situation where citizens care only about the location of a public good, such as a school or a water well. However, the results of the model naturally extend to a much more general set of environments where an individual's preferences are correlated with geographic location.

In addition to different bliss points, individuals in the society differ by their competence, or education, which may be high or low: $a \in \{0, h\}$, with $h > 0$. In other words, each citizen i is characterized by a pair (a_i, b_i), where the first component is his competence (a for *ability*), and the second is his location (b for *bliss point*). To study the trade-off between policy position and competence, we assume that almost all individuals are incompetent ($a_i = 0$), except for a finite number N who have high competence $a_i = h$. The results are most transparent when $N = 1$, which we assume for the rest of the article; in Supplementary Appendix A (Section A1) we show that the results go through if we allow N to be any number. We assume that the types of all individuals are known to all other individuals.[22] We also make a technical assumption that, for any $b \in [-B, B]$, there is a citizen i with $(a_i, b_i) = (0, b)$; this assumption that there is an incompetent citizen for any policy position ensures existence of an equilibrium.

Policy p is chosen and implemented by a governing body (henceforth "council"), which is elected by the citizens and from the citizens. We assume that the council consists of two elected individuals (again, this assumption is relaxed in Supplementary Appendix A in section A4), and both must agree on a policy for it to be chosen. We also assume that the competence of council members increases the quality of policy implementation regardless of the policy. If the two council members have types (a_l, b_l) and (a_r, b_r) and implement policy p, then individual i will get utility:

$$w_i(a_l, a_r; p) = a_l + a_r + u(p, b_i) = a_l + a_r - k(p - b_i)^2.$$

To simplify exposition, we assume that council members pick a policy that maximizes their joint utility: $p = \frac{b_l + b_r}{2}$. Notice that this policy will be the outcome of a bargaining game with alternating offers (Rubinstein, 1982) or a legislative bargaining game with random recognition (Baron and Ferejohn, 1989; Banks and Duggan, 2000) in the limit where offers are made very frequently.[23] We consider a bargaining game explicitly when we generalize the game to incorporate councils with more than two members and show that the results are robust to alternative assumptions regarding the bargaining process (Supplementary Appendix A). Here, slightly abusing notation, we assume that having a council with members (a_l, b_l) and (a_r, b_r) yields utility:

$$w_i(a_l, b_l, a_r, b_r) = a_l + a_r + u\left(\frac{b_l + b_r}{2}, b_i\right) = a_l + a_r - k\left(\frac{b_l + b_r}{2} - b_i\right)^2.$$

We compare two electoral procedures: at-large elections and district elections. In district elections, the society is divided into two districts: left district L, containing individuals with $b_i < 0$, and right district R, containing individuals with $b_i \geq 0$. This division is made according to the location of an individual's residence, so that the two districts also differ by the policy preferences of their inhabitants.[24] Each individual casts a vote for one of the citizens living in

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22. Given the context of the experiment, it is natural to assume that location of villagers' dwellings and education are observable to fellow villagers. But the theory is applicable in environments where political positions and/or competence are not readily observable by voters, as long as candidates are able to signal their political positions or competence prior to elections.

23. If the offers are not made frequently, $p = \frac{b_l + b_r}{2}$ is still the expected outcome of the game, but there is some variance, which will result in disutility for the citizens. We consider an explicit bargaining game in Supplementary Appendix A (Section A2).

24. The assumption that the two districts perfectly segregate the inhabitants by political preferences is stark, but simplifies the exposition considerably (and is not unrealistic in the context of the experiment). The substantive insights of the model hold as long as the correlation between geographic location and political preferences is above some threshold. The details are available from the authors upon request.

his/her district; that is, every individual living in the district is considered a candidate.[25] Then, in each district, the individual who received the largest share of votes is elected, and in the case of a draw, a random person among those who received the most votes is chosen. In at-large elections, the entire society comprises a single district, and each individual casts two votes for two (different) citizens. The two candidates who receive the most votes are elected.[26] This setup assumes a homogenous population with no gender differentiation; in Supplementary Appendix A (Section A7), we show that the predictions of the model hold if the council is formed from two populations (*e.g.* men and women) that have the same geographic distribution, which is more in-line with the experiment.

The strategy of each voter in district elections is, therefore, $\lambda(i)$, the identity of the individual in his district for whom he casts his vote (since only members of the same district may be elected, $b_{\lambda(i)} \in [-B, 0)$ if $b_i \in [-B, 0)$ and $b_{\lambda(i)} \in [0, B]$ if $b_i \in [0, B]$). The strategy of each voter in at-large elections is $\Lambda(i) = (\lambda_1(i), \lambda_2(i))$, which corresponds to the (unordered) pair of individuals for whom he votes. All voting decisions are made simultaneously, which gives rise to a coordination problem. We make the following refinement:

Definition 1. *Voting strategies $\{\lambda_i\}$ in case of district elections or $\{\Lambda_i\}$ in case of at-large elections constitute an equilibrium if, for any electoral district (i.e. L or R in the first case, or the entire society S in the second), there is no subset of voters X in this district who would strictly improve the utility of all voters in X by choosing different voting strategies.*

In other words, we refine the (otherwise huge) set of Nash equilibria by allowing for deviations by coalitions of voters, but only within a district. For at-large elections, our equilibrium concept coincides with the strong Nash.

3.2. *Analysis*

Analysis of the game is greatly simplified by the fact that the median voter theorem applies in both at-large and district elections. In district elections, each of the two districts L and R will elect the council member most favoured by the median voter in that district, holding the decision of the other district fixed (denote these median voters by m_L and m_R, respectively). In at-large elections, the median voter of the entire society, m_S, will elect the pair of candidates that he/she likes best. These individuals (or this pair of individuals) will, in fact, be the Condorcet winners in their respective districts. These results hold because individual preferences exhibit the single-crossing property: if a citizen i prefers policy p_1 to $p_2 < p_1$, then so does a citizen j with $b_j > b_i$. The fact that one of the citizens is competent (denote his policy preference by q, so

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25. Our model of elections falls into the category of citizen-candidate models with costless entry (Besley and Coate, 1998; see also Osborne and Slivinski, 1996 and Besley and Coate, 1997).

26. We will prove that in at-large elections there is a Condorcet winner, that is, a pair of citizens such that there is no other pair that a majority would want to elect. The voting model we selected ensures that the Condorcet winner pair is elected. The assumption that voters cannot cast both their votes for the same candidate is important. If voters could cast both votes for the same candidate, there may be a continuum of election outcomes even if coalitional deviations are allowed, as in Definition 1 (we show that in Supplementary Appendix B). We would run into the same problem if each citizen had only one vote. However, if citizens could cast more than two votes, or if they could cast votes for pairs of candidates rather than individuals, the same Condorcet winner pair would always be elected. This is an interesting observation per se: because citizens' preferences in at-large elections are defined over pairs of politicians, voting procedures that facilitate extracting this information are more successful in aggregating these preferences. (In district elections, each district has a standard majority voting rule and for any choice by the other district it elects the Condorcet winner.)

his type is (h,q)) makes the argument just marginally more involved. The proof of Proposition 1 (Supplementary Appendix B) fills in the details.

Proposition 1. *In both district elections and at-large elections, equilibria exist, and the types of elected politicians are uniquely determined for almost all realizations of q. Moreover:*

(1) *In district elections, the district without the competent citizen elects the most biased individual (with $b_i = \pm B$), and the district with the competent citizen (h,q) elects either this citizen or the most biased individual (with $b_i = \pm B$).*

(2) *In at-large elections, the two elected citizens are the most competent individual (h,q) and a citizen with the opposite political preferences $(0,-q)$.*

Proposition 1 implies that the equilibrium concept we use (Definition 1) is sufficiently strong to pick a (generically) unique equilibrium. To build an intuition for which types of citizens get elected, consider at-large elections first. The median voter in the whole district, m_S, has the bliss point $b_{m_S} = 0$ and his ideal outcome is to elect two council members who negotiate and implement his ideal policy 0, while at the same time making sure that one of the two is competent. This is feasible: he can achieve this ideal outcome by having the competent citizen (h,q) and his political antipode $(0,-q)$ elected.

Next, consider district elections. The reason to elect the most competent citizen if he lives in the district is clear, but what is the rationale to elect the most biased individual? To answer this question, suppose that district L elects a citizen of type (a_l, b_l) and consider the best response of the median voter of district R, m_R. His ideal policy is $\frac{B}{2}$, and if he elects a resident with type (a_r, b_r), he would get utility:

$$w_{m_R}(a_l, b_l, a_r, b_r) = a_l + a_r - k\left(\frac{b_l + b_r}{2} - \frac{B}{2}\right)^2. \tag{1}$$

The right-hand side of equation (1) is strictly increasing in b_r for $b_r \leq B$, because $b_l \leq 0$, and thus it reaches its maximum for $b_r = B$. In other words, holding competence fixed, the median voter of district R prefers the most biased candidate, and this is true regardless of voting strategies of the citizens in the left district.[27] We thus see the following strategic delegation effect: even though the median voter m_R likes policies which are close to m_R, he/she prefers to elect a biased citizen because the latter would negotiate a better policy; this is similar to delegating bargaining to a more committed type.[28] The same effect causes the median voter in the left district, m_L, to favour a candidate with $b_l = -B$. Of course, it is also possible that the most competent candidate will be chosen over the most biased, and the next proposition tells us exactly when this happens.

Proposition 2. *In district elections, both districts elect the most biased and incompetent candidates if:*

$$|q| < \hat{q} \equiv 2B - \sqrt{4\frac{h}{k} + B^2}, \tag{2}$$

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27. This preference for the most biased candidate would not necessarily hold if the distribution of individuals were non-uniform, for example, in the case of non-bounded support. However, the tendency to elect a relatively biased candidate would remain. We maintain the assumption of a uniform distribution for expositional purposes.

28. This effect is similar to strategic polarization in the case of a divided government in Alesina and Rosenthal (2000) and in the case of party competition in Ortuño-Ortín (1997).

where q is the ideal point of the competent citizen. If equation (2) does not hold, then one district elects the most biased of its residents, and the other elects the competent citizen. The competent citizen is more likely to be elected if:

- *(i) the society is more homogenous, i.e. less polarized in their preferences (B is lower);*
- *(ii) competence is more pronounced (h is higher);*
- *(iii) policy matters less relative to competence (k is lower).*

The district without a competent citizen is bound to elect the most biased council member, $(0,-B)$ or $(0,B)$. The median voter of the other district faces a trade-off between electing the most biased citizen and the competent citizen. Thus, he is more likely to choose competence over policy if competence is more important (h is high and k is low) or if the competent citizen is also biased (q is close to $\pm B$). Interestingly, polarization hurts the chances of the competent citizen, because high polarization makes the median voter more sensitive to the political preferences of the council member he elects.

We can now compare the expected outcomes of at-large elections with those of district elections. *Ex ante*, the identity of the competent individual is not known, but in expectation the following proposition holds:

Proposition 3. *In at-large elections, as compared to district elections:*

- *(1) The expected competence of an elected council member is higher (strictly higher if $\frac{h}{k} < \frac{3}{4}B^2$) and this difference is increasing in B and k;*
- *(2) The expected polarization (distance between preferences of a council member and the society's median voter, normalized by dividing by B) is strictly lower, and this difference is increasing in B and k;*
- *(3) There is no correlation between preferences and competence of council members in at-large elections, while in district elections, competence and distance from the median voter are negatively correlated.*

These results follow from Propositions 1 and 2 and are shown in Figure 2, which depicts the outcome of elections (types of council members) for different realizations of q. In at-large elections, the competent individual is always elected, which is not true in district elections provided that $\hat{q} > 0$. Interestingly, if h is high or k is low or B is low, the competent individual will be elected in both cases and the difference between the two types of elections disappears. The polarization result is easy to see from the following consideration: the two council members elected in at-large elections are as far from the median as the competent one, while in district elections, one or both districts elect individuals who are further from the median than the competent individual. In addition, if $\hat{q} > 0$, then in district elections, the most moderate types will never be elected. Finally, in at-large elections, there is no correlation between preferences and the competence of a council member: as one can see from Figure 2, any council member with any political bliss point is equally likely to be competent or incompetent. In contrast, in district elections, the most biased council members are likely to be incompetent, and any council member with a more moderate ideal point is likely to be competent.[29]

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29. The ability of the median voter to choose both council members at once help him achieve the first best, but it does not drive the results in Proposition 3, as we show in Supplementary Appendix A (Section A2 shows that at-large elections lead to a worse outcome than district elections if offers are made infrequently and Section A6 shows that at-large
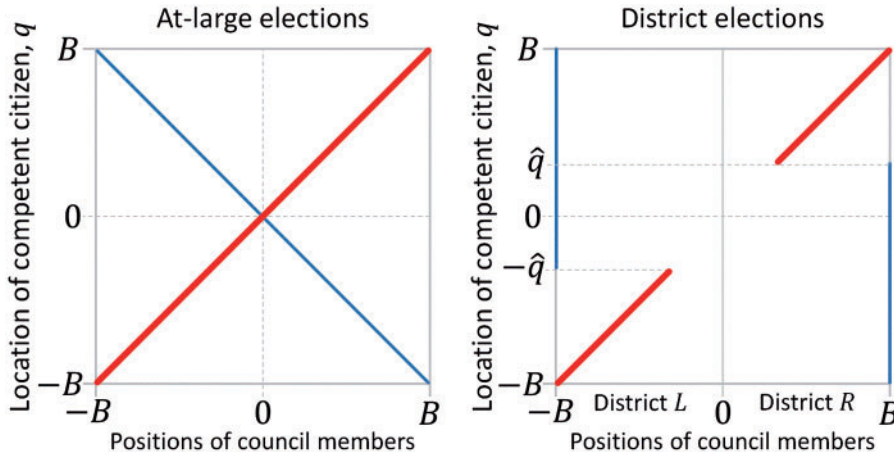
FIGURE 2

Types of council members (competent in thick, incompetent in thin) as a function of the competent citizen's ideal point

Let us consider the effect of electing a competent candidate on political polarization. At first glance, the question seems moot: in at-large elections, a competent candidate is always elected, while in district elections, the other, non-competent council member has extreme bias. Consider, however, the possibility that a village has no competent candidates. In the case of district elections, such a village would elect the two most biased candidates for the same strategic reason as before. In the case of at-large elections, there are multiple equilibria (any two candidates with opposite biases may be elected); however, if one restricts attention to equilibria which are the limits of ones in a game where council members play an explicit alternating bargaining game as in Section A2 in Supplementary Appendix A (a plausible refinement), only the equilibrium where two politicians located in the centre, with $b=0$, will be elected. Formally, we have the following proposition:

Proposition 4. *In district elections, electing a competent council member in one district does not affect the political bias of the council member elected in another district. In at-large elections, electing a competent council member increases the political bias of the second council member, provided that the equilibrium that is the limit of equilibria in games with an explicit bargaining between council members is played.*

Apart from the empirical predictions about competence and polarization, our model has clear welfare implications:

Proposition 5. *In at-large elections, compared to district elections, the expected utility of every individual is higher, and thus social welfare is higher.*

In light of Proposition 3, it is not surprising that social welfare is higher, in expectation, in at-large elections. It is more striking that the expected utility of every single individual is higher in at-large elections, provided that the expectation is taken before the location of the competent

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elections result in more competent council members even if one member is elected at a time. The results are entirely driven by the bargaining over policies by the council members, which is anticipated by voters at the time of elections.

citizen becomes known. The intuition, however, is simple: the expected policy is $\mathbb{E}p = 0$ under both procedures, and by moving from at-large to district elections, the society makes the policy outcome less certain and runs the risk of electing two incompetent citizens; both effects hurt every citizen equally.

4. EMPIRICAL PREDICTIONS

The theoretical model generates several empirical predictions, which we test using data from the field experiment. Only empirical results for the first prediction were obtained before the model was formulated. All the remaining empirical predictions were first obtained from the model and only then tested empirically.

Based on the first statement of Proposition 3, we formulate the following empirical prediction:

(1) The competence of elected candidates is higher in at-large elections than in district elections.

Following Besley *et al*. (2005), Galasso and Nannicini (2011), Gagliarducci and Nannicini (2013), and Folke *et al*. (2014), we use educational attainment as a measure of candidate competence, since there is evidence that the leader's educational level has a positive effect on governance outcomes. In particular, better educated public officials are less likely to use power opportunistically (Besley *et al*., 2005), are more likely to promote higher economic growth (Besley *et al*., 2010; Congleton and Zhang, 2013), and are more likely to provide higher quality public goods (Martinez-Bravo, 2014b). We also check the robustness of our results to using occupation as a measure of candidate competence.[30]

The first part of Proposition 3 also asserts that the effect of the electoral system on the competence of politicians is stronger in communities with more diverse preferences (higher *B*) or where the choice of policy is relatively more important than the politicians' competence (higher *k*), whereas for communities with sufficiently homogenous preferences (where $\frac{3}{4}B^2 < \frac{h}{k}$) there should be no differences in the competence of candidates elected by the two electoral systems. Thus, we formulate the following two empirical predictions:

(2) The difference in the competence of council members between at-large and district elections is higher in more heterogeneous villages.
(3) In homogenous villages, the competence of council members does not depend on the type of elections.

In the empirical analysis, we use three alternative measures of heterogeneity: fractionalization of preferences over projects; ethnic heterogeneity; and geographic size of villages. These measures were chosen due to the nature of tasks performed by council members. As noted above, the main tasks of the elected council members were to guide the choice over development projects and then oversee the implementation of these projects. Thus, a candidate's preferences over projects can affect both the type and the location of development projects, which can be treated as the policy dimension in the model.

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30. Other potential measures of candidate competence such as age or being a member of the pre-existing elite are not well suited for the Afghan context, in which capture of local institutions by pre-existing elites (including elders) is a serious concern.

Fractionalization of preferences over projects directly measures heterogeneity of interests in terms of project type and corresponds to higher B in the model. In addition, if preferences are diverse, policy choice becomes more important relative to the quality of implementation, so fractionalized preferences correspond to the case where policy is important relative to competence—that is, high k. Ethnic heterogeneity is often used in the literature to capture differences in tastes (*e.g.* Alesina *et al.*, 1999) that might affect preferences over both project type[31] and location (if villages are ethnically segregated),[32] so ethnically heterogeneous villages are also likely to have higher B and k. Finally, preferences over project location are likely to be driven by the location of voters and candidates. The larger the village, the more diverse the preferences of villagers with respect to project location (which corresponds to higher B), and the more important the policy dimension relative to the quality of candidates (which corresponds to higher k).

The second statement of Proposition 3 suggests that expected polarization is lower in at-large elections, leading to the following prediction:

(4) Elected council members exhibit less biased policy preferences under at-large elections as compared to district elections.

In the model, polarization corresponds to the distance between council member preferences and the median voter. In the empirical analysis, we make the assumption that the geographic location of elected candidates and voters reflects their policy preferences. This assumption is based on two observations. First, preferences over the type of projects are geographically correlated. Table C1 in Supplementary Appendix C shows that the probability that two respondents within the same village prefer the same type of project in the baseline survey is significantly higher for villagers who live closer to each other (see Section 5 for more information on measures employed in the analysis). Secondly, all four main types of projects (drinking water, irrigation, electricity, and roads) are likely to benefit households that live closer to the project location more (even in the case of electricity projects, which mainly refer to micro-hydro generators, houses located closer to the generator are more likely to get electricity). Indirect evidence that villagers prefer to have projects located closer to their residence is presented in Beath *et al.* (2015b), which shows that projects selected via a method that privileges village elites end up being located closer to the houses of village heads. These results suggest that village heads have a preference for projects that are located closer to their houses, which is consistent with the assumption that all villagers would prefer to have projects be located closer to their home.

Thus, based on the assumption that the geographic location of elected candidates and voters reflects their policy preferences, we use the distance between a council members's house (which reflects his preferences) and the centre of the village (which reflects the preferences of the median voter) as a proxy for the bias in his/her preferences.

Proposition 4 leads to the following empirical prediction:

(5) Under at-large elections, if a competent candidate is elected, the bias of all other council members is lower. There is no such effect in district elections.

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31. This is confirmed in our context, as ethnic heterogeneity is correlated with fractionalization of preferences over types of projects (the correlation is significant at the 5% level).

32. Unfortunately, the number of observations within villages is not large enough to directly test for the existence of segregation.

The third statement of Proposition 3 corresponds to the following empirical prediction:

(6) In district elections, there is a negative correlation between the competence of an elected representative and the bias of his preferences, while there is no such relationship in at-large elections.

We test this prediction using the same measures as above—educational attainment as a proxy of elected candidate's competence and the distance between an elected candidate's house and the centre of the village as a proxy for the bias in his preferences.

According to Proposition 5, social welfare is higher in at-large elections as a result of the election of more qualified candidates. Although we do not have measures of social welfare, we can examine the effect of electoral rules on outcomes that are likely to be affected by the competence of council members and could serve as proxies for the welfare of villagers.[33] Since the elected council prepares budget for approval by NSP's central office and oversees project implementation, the competence of elected candidates may increase the speed of project implementation. In particular, council members of high competence would be expected to implement projects faster, as more educated candidates are expected to take less time to prepare the budget and sign contracts with project subcontractors. Thus, we formulate the following empirical prediction:

(7) Projects are implemented faster in villages that held at-large elections as compared to villages with district elections.

In particular, we look at the effect on two measures that are likely to affect the welfare of villagers: time to project start (which corresponds to the period of time until resources start flowing into the village) and time to project completion (which corresponds to the period of time when villagers can start enjoying the benefits of these projects).

Candidate quality might also affect the quality of project implementation and, as a result, the benefits delivered by the projects (access to clean water, electricity, irrigation etc.). Successful project implementation, in turn, should also improve overall economic welfare and have a positive effect on the attitudes of the population towards their local leaders. Thus, we can formulate an additional empirical prediction:

(8) The effectiveness of development projects, improvements in general economic welfare, and increases in support for local leaders and democratic processes are all higher in villages that held at-large elections as compared to villages with district elections.

To examine the effect of the electoral system on the effectiveness of development projects, we exploit data on access to clean drinking water, access to electricity, and agricultural productivity. These three indicators measure impacts of the three projects most commonly funded by NSP in

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33. Another channel through which election type could affect social welfare is the location of the project chosen by the village council. According to the model, in equilibrium, the project is implemented in the village centre, except for the case of district elections if a competent candidate is actually elected, and only if the competent candidate is sufficiently radical. Thus, we do not expect to see a pronounced effect of election type on project location. Empirically, on average, district elections lead to a higher distance between the project location and the village centre, and the election of a competent candidate makes this effect stronger (consistent with the model), although neither of the effects is statistically significant (see Table C9 in Supplementary Appendix C). The low number of villages that could drive the result (there are twenty five villages in the sample which held a district elections where a competent candidate was elected and where data on project location is available) may also contribute to the lack of conclusive evidence for this channel.

TABLE 2

Summary statistics for outcome variables

	Mean	Standard error	Obs.	Mean	Standard error	Obs.	t-statistics for equality of means
	District elections			At-large elections			
Male council member finished high school	6.98	25.50	1,031	10.46	30.62	985	1.78
Male council member finished middle school	15.42	36.13	1,031	18.27	38.67	985	1.04
Male council member finished primary school	31.81	46.60	1,031	33.50	47.22	985	0.41
Female council member finished high school	1.08	10.36	1,015	0.51	7.13	980	1.03
Female council member finished middle school	3.25	17.74	1,015	2.35	15.15	980	0.83
Female council member finished primary school	10.34	30.47	1,015	8.88	28.46	980	0.56
Distance between residences of council members and village centre (metres)	502.28	1155.18	509	295.70	338.59	494	1.75
Days between council election and project start	413.30	180.88	252	375.36	155.21	226	1.86
Days between council election and project end	710.67	181.04	252	682.70	172.54	226	1.28

Note: t-statistics adjusted for clustering at the village level.

the sample: drinking water wells, electrical generators, and irrigation facilities.[34] Measures of general economic welfare are provided by measures of subjective economic welfare, as well as measures of household income and expenditure. Finally, we look at villager attitudes towards local leaders and their support for democratic elections. Since the village council elections under study were the first local elections experienced by these villagers, we expect satisfaction with particular candidates elected to the council to be readily translated into attitudes towards elections more generally.

5. DATA

Indicators of educational attainment of council members, which are used to assess the competence of elected representatives, are given by three dummy variables indicating whether a member finished high school, middle school, or primary school. Data on members' educational attainment, as well as their gender, age, occupation, and district of residence and the election results for each village, were provided for 2,044 men and 2,015 women elected to councils of 241 villages by NGOs contracted to facilitate NSP in the ten sample administrative districts.[35] The average council size in terms of male members is 8 and the median is 7 (see Figure C1 in Supplementary Appendix C for the histogram for council size). Overall, the level of education of council members is very low, although still higher than the average level of education of villagers (Table 1). Among male council members, only 9% had finished high school, 17% had finished middle school, and 33% had finished primary school (see Table 2 for a breakdown by election type). In 161 out of 241 villages, none of the male council members had finished high school. The educational level among female representatives was even lower: only 0.8% had finished high school and less than 10% had finished primary school.

We use the distance between the location of council members' houses and village centres as a proxy for policy bias of elected representatives. To construct this measure, we first compute the

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34. The fourth most popular type of project is the renovation of roads and bridges within the village, but unfortunately we do not have good measures to capture the benefits delivered by this type of project.

35. Of the nine villages for which data were not received, seven villages did not comply with the NSP treatment assignment, an error driven primarily by confusion between villages with similarly sounding names. For the remaining two villages, the relevant NGO did not provide the necessary information. In both cases, attrition was not correlated with the assigned electoral rules.

location of the village centre by averaging GPS coordinates of the houses of the baseline survey respondents. Then, we compute the distance between the village centre and the locations of council members' houses. Information on the locations of council members' houses is available only for a subset of villages, since some monitors failed to collect coordinates.[36] For cultural reasons, information was not collected on the location of the residences of female council members. The data provides coordinates of the residences of 1,104 male council members in 140 communities in nine out of ten evaluation districts. Although much data are missing, it is not correlated with the type of election assigned to the village.

Measures of preference fractionalization and the size and ethnic heterogeneity of villages are derived from data collected in the baseline survey, which was administered in September 2007 to 2,387 randomly selected male heads-of-household in the 250 sample villages. Data on preference fractionalization are given by responses to a question whereby respondents were asked to indicate their preference from a list of fifteen potential projects commonly funded by NSP. In each village v for each type of project j we calculate the share s_{vj} of respondents that indicated this project and calculate fractionalization of preferences in the village $f_v = 1 - \sum s_{vj}^2$. An indicator of preference fractionalization is then given by a dummy variable, which equals one if fractionalization is above the median in the sample and zero otherwise. An indicator of village size is given by a dummy variable which captures whether the average distance between respondents' households is above the sample median. Ethic heterogeneity of a village is given by a dummy variable that equals zero if all villagers belong to the same ethnicity.[37]

A measure of the speed of project implementation is derived from NSP administrative records,[38] which indicate the type, budget, and start and end dates of 478 projects funded by NSP.[39] Project start dates range from April 2008 to February 2011 and completion dates range from July 2008 to September 2011. Two indicators are constructed, which measure the number of days between election of a council and the start of a project and the number of days between election of a council and the end of a project.[40]

Measures of project effectiveness, improvements in general economic welfare, and increases in support for local leaders and democratic processes are derived from data collected in the midline and endline surveys. The midline survey was administered to 2,367 male and 2,141 female respondents between May and October 2009 and the endline survey was administered to

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36. In addition, some coordinates contained obvious mistakes and were excluded from the analysis. These mistakes were identified by superimposing the location of council members' houses and satellite images of the respective villages and identifying the instances in which coordinates did not belong to the village. We documented all such instances and ensured that the data cleaning exercise was conducted in absence of information about the treatment status of the villages, so that it does not bias the results. We winsorize the distance at the 95% quintile to limit the influence of potential outliers.

37. The measure is based on a question that asks heads of households to indicate their ethnicity with seven options: Pashtun, Tajik, Hazara, Uzbek, Turkmen, Baluch, and other. All results hold if we use a similar measure based on the question from the focus group of village leaders that asked them to indicate what ethnicities reside in the village or if we use a measure of ethnic fractionalization instead, although the latter measure of fractionalization is not very reliable given the small number of observations per village.

38. Information from NSP administrative records is well correlated with the self-reported data on project completion from the midline survey, but provides more detailed information on the timing of the works.

39. Six projects failed and were terminated before completion. For some projects, the time between the start and the end of the project was unrealistically high, so we trimmed all observations for which the duration of project implementation was above the 95th percentile. There is no significant difference in the number of trimmed observations between the two types of electoral rules.

40. Election dates do not depend on the type of electoral rules. The results are similar, but less precise if we look at the number of days from a specific date common to all villages.

2,130 male and 1,858 female respondents between May and October 2011.[41] Project effectiveness is assessed by five indicators: (1) number of seasons in past year during which the primary source of drinking water was perceived to be contaminated; (2) incidence of diarrhea among children in the past two weeks; (3) hours of electricity available in the past month; (4) yield of the most recent harvest; and (5) revenue from the most recent harvest.[42] Indicators of improvement in general economic welfare are given by: (1) a dummy for whether the respondent perceived an improvement in their economic situation in the past year; (2) a dummy for whether the respondent attributes positive economic change to local leaders and/or the council; (3) annual household income; and (4) annual household expenditure.[43] Measures of support for local leaders and democratic processes are given by: (1) whether the respondent expressed desire to change some decisions made by local leaders in the last year; (2) whether the respondent expressed dissatisfaction with implementation of the development projects in the village in the past three years; (3) whether the respondent had any complaints about corruption or nepotism related to the projects; (4) whether the respondent prefers a secret ballot election for village headman, over the customary hereditary practice; and (5) whether the respondent prefers a secret ballot election for the President of Afghanistan.[44]

To address the issue of multiple inferences, we construct a summary index of the 18 variables used in this analysis following the approach of Kling *et al.* (2007). In particular, we define the summary index as the equally weighted average of z-scores of the individual indicators, where the z-scores are calculated by subtracting the mean in villages with district elections and dividing by the standard deviation in villages with district elections. Thus, each component of the index has a mean equal to 0 and a standard deviation equal to 1 for villages with district elections.

6. EMPIRICAL RESULTS

The first empirical prediction of the model posits that at-large elections result in the election of more competent representatives. To test this prediction, we estimate the following OLS model:

$$\text{Education}_{vi} = \alpha + \tau \cdot AL_v + \phi_q + \varepsilon_{vi}, \tag{3}$$

where Education$_{vi}$ is a dummy variable for whether council member i in village v has finished high school, AL_v is a dummy variable, which equals one if village v has been assigned at-large elections and zero if the village has been assigned district elections, ϕ_q is the quadruple fixed effect, and ε_{vi} is the error term. Standard errors are clustered at the village level. The first empirical prediction posits that $\tau > 0$.

Under district elections, an average of 7% of male council members finished high school (Table 2), whereas under at-large elections, the proportion is higher by four percentage points (the

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41. Because of the deterioration in security conditions, we were not able to conduct surveys of male heads of household in eleven villages at midline and in thirty-two villages at endline. For female heads of household the surveys were not conducted in thirty-three villages at midline and in fifty-nine villages at endline. Enumerators administering the male household questionnaire were instructed to locate and interview the same households and, whenever possible, the same villagers who participated in the baseline survey. Enumerators were able to successfully locate such respondents in 65% of cases at midline and 44% of cases at endline. The predominant reason for enumerators not being able to interview baseline respondents was that the person was away from home on the day that the survey team visited the village, as it was the time of harvest. Differences in levels of attrition between villages with different electoral rules are not statistically significant.

42. The latter three variables were winsorized at the 95th percentile and logged.

43. The first two measures are available for female and male respondents separately. The latter two variables were winsorized at the 95th percentile and logged.

44. Indicators (1) and (4) are available for female and male respondents separately.

TABLE 3
Effect of electoral rules on council members' competence

	Percent of male council members who finished high school			
	(1)	(2)	(3)	(4)
At-large elections	3.96*** [1.32]	0.07 [1.80]	1.95 [1.23]	−0.90 [1.55]
Fractionalized project preferences * At-large elections		7.97*** [3.01]		
Fractionalized project preferences		−3.10 [1.99]		
Ethnically mixed village * At-large elections			7.9** [3.21]	
Ethnically mixed village			−3.27 [2.21]	
Geographically large village * At-large elections				9.96*** [3.01]
Geographically large village				−3.36* [1.96]
Quadruple fixed effects	Yes	Yes	Yes	Yes
Observations	2,016	2,016	2,016	2,016
R^2	0.18	0.19	0.19	0.19

Notes: The unit of observation is council member. The dependent variable is a dummy variable that equals 100 if a council member finished high school and zero otherwise. Standard errors clustered at the village level in parentheses. Significant at * 10%; ** 5%; *** 1%.

difference is statistically significant at the 1% level; see column (1) in Table 3. Although modest in absolute magnitude, this effect constitutes a 57% increase in the share of male council members who finished high school. Given the overall low level of education of council members and the very low level of education and literacy in rural Afghanistan, the effect is substantively large. Additional results discussed in Section 7 indicate that these results are not driven by a mechanical effect related to geographic restrictions in district elections or by changes in the incumbency advantage. Thus, the results lend confirmation to the first empirical prediction of the model.

Due to the very low levels of variation in the competence of elected female representatives (which in turn are caused by the very low levels of female education in Afghanistan), the empirical analysis of the effects of electoral rules on education levels focuses on male council members. Theoretical analysis shows that the main predictions of the model regarding male candidates hold in the presence of a group with no such variation, but also predicts no effect of the electoral system on the competence of female candidates (see Section Section A7 of Supplementary Appendix A).[45] Consistent with this prediction, the broadening of the sample to include both male and female council members does not substantively change the finding that at-large elections enhance the competence of elected representatives, but the effect is fully driven by male council members, with no effect for female council members (see Table C2 in Supplementary Appendix C).[46]

45. The extension of the model in Section A7 of Supplementary Appendix A also predicts that female council members would have more extreme policy preferences if elected by district elections and that the extremity of such preferences would be higher than that of male council members. Unfortunately, we do not have information on the location of households for female council members, so we cannot test this prediction.

46. Another reason to focus on male council members is that in Afghan villages, women are traditionally excluded from community-level decision-making and, consequently, female council members are not expected to have a significant

The second empirical prediction posits that the effect of at-large elections on the competence of elected council members is higher in more heterogeneous villages, while the third empirical prediction posits that the effect of at-large elections is insignificant in homogenous villages. To test the second and third empirical predictions of the model, we use the following OLS model:

$$\text{Education}_{vi} = \alpha + \gamma \cdot AL_v + \delta \cdot AL_v \cdot \text{Heterogen}_v + \mu \cdot \text{Heterogen}_v + \phi_q + \varepsilon_{vi}, \qquad (4)$$

where Heterogen_v is a measure of heterogeneity of village v and all other variables are the same as in equation (3). The second empirical prediction posits that $\delta > 0$ and the third one that $\gamma = 0$ (as long as the measure of heterogeneity is normalized to zero in homogenous villages).

Consistent with the second empirical prediction, we find that the effect of variation in electoral rules is significantly stronger in more heterogeneous villages for all measures of heterogeneity (columns (2–4) in Table 3). Consistent with the third empirical prediction, we find no significant effect of variation in electoral rules on the competence of elected candidates in homogenous villages. The results also provide some evidence that increasing heterogeneity is associated with lower competence of elected candidates in villages with district elections. Although this result is not based on an exogenous source of variation, it provides evidence that is consistent with Proposition 2 and thus with the hypothesized mechanism for the effect. To further ensure that the interaction results are not driven by some other characteristics of villages that are correlated with our measures of heterogeneity, we show that they are robust to controlling for a number of observable characteristics of villages, as well as their interaction with the treatment indicator (see Table C3 in Supplementary Appendix C).[47]

The first two empirical predictions hold—but with smaller coefficients—if we define competence as the completion of middle school rather than high school (see Table C4 in Supplementary Appendix C), but do not hold if we define it as the completion of primary school. The first empirical prediction also holds if competence is defined as holding an occupation other than farming (see Table C5 in Supplementary Appendix C).[48] The results for the second empirical prediction are no longer statistically significant if competence is defined by occupation, but the signs of the coefficients are aligned with the predictions of the model. The results in Table 3 are also robust to looking at village averages, rather than at individual council members, which indicates that the results are not driven by a few villages with a high fraction of educated council members.[49]

The fourth empirical prediction posits that district elections will lead to the election of representatives that hold more extreme policy preferences. To test this prediction, we use the following OLS model by estimating a model similar to equation (3) with the outcome variable provided by the logarithm of the distance between the house of an elected council member and the village centre:

$$\text{Distance}_{vi} = \alpha + \chi \cdot AL_v + \upsilon \cdot \text{AverageDistance}_v + \phi_q + \varepsilon_{vi}, \qquad (5)$$

effect on project selection and implementation. This is confirmed by Beath *et al.* (2015a), which finds that the preferences of even the most important female villagers do not have a significant effect on the choice of projects. However, despite their limited role in project-related decisions, female council members have played an important role in solving women-related issues and their election had an important effect on attitudes towards women (Beath *et al.*, 2013a). However, these considerations are not related to the trade-off analysed in this article.

47. The set of additional controls includes: population of a village, average household size, average age of male villagers, household expenditure on food in last 30 days, share of households for which the primary source of income is agriculture, share of male villagers who finished high school.

48. Farming is the occupation characterized by the lowest levels of education. Of council members, 53% are farmers. The results also hold if we broaden the definition to include keepers of livestock and unskilled labourers.

49. These results are available upon request.

TABLE 4
Effect of electoral rules on council member location

	Full sample			Council members who did not finish high school		
	(1)	(2)	(3)	(4)	(5)	(6)
At-large elections	−0.28*** [0.11]	−0.25*** [0.07]	−0.25*** [0.07]	−0.55*** [0.16]	−0.40*** [0.12]	−0.40*** [0.12]
At-large elections * at least one council member finished high school			0.73*** [0.21]	0.41** [0.20]	0.41** [0.20]	
District elections * at least one council member finished high school			0.55** [0.22]	0.31* [0.18]	0.30 [0.19]	
Natural log of median distance between residences of villagers	[0.05]	0.72*** [0.05]	0.72***	0.67*** [0.06]	0.67*** [0.06]	
Share of baseline survey respondents who finished high school			0.56* [0.31]			0.17 [0.62]
Quadruple fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,003	1,003	1,003	770	770	770
R^2	0.192	0.346	0.347	0.209	0.338	0.338

The header "Natural log of distance between residences of council members and village centre" spans all columns.

Notes: The unit of observation is council member. The sample includes only male council members. Standard errors clustered at the village level in parentheses. Significant at * 10%; ** 5%; *** 1%.

where Distance$_{vi}$ is the logarithm of the distance between the house of council member i and the centre of the village, AverageDistance$_v$ is the average distance between houses of baseline survey respondents in village v (which reflects the size of the village), and other variables are the same as in the previous equations. The fourth empirical prediction posits that $\chi < 0$.

Consistent with the fourth empirical prediction, we find that the distance between the homes of elected officials and the centre of the respective village is smaller in at-large elections (see columns (1–2) in Table 4).[50] The magnitude of the effect is sizeable, with the distance being approximately 25% smaller in villages with at-large elections.

The fifth empirical prediction posits that if a competent candidate is elected, the distance between the homes of other elected representatives and the centre of the respective village is smaller in at-large elections, whereas there is no such relationship in district elections. We test this prediction by estimating the following model on the subsample of elected candidates who are not competent:

$$\text{Distance}_{vi} = \alpha + \chi \cdot AL_v + \pi \cdot AL_v \cdot \text{Competent} + \theta \cdot DS_v \cdot \text{Competent}_v$$
$$+ \upsilon \cdot \text{AverageDistance}_v + \phi_q + \varepsilon_{vi}, \tag{6}$$

where Competent$_v$ is a dummy variable that equals one if at least one competent candidate is elected in village v and zero otherwise, DS_v is a dummy variable for district elections, and all other variables are the same as in the previous equations. The empirical prediction posits that $\pi > 0$ and $\theta = 0$. Since the supply of competent candidates depends on the educational level of the village population, we also control for the educational attainment of baseline survey respondents.

50. Not surprisingly, the distance between the homes of elected officials and village centres is larger in villages with greater distance between the houses of baseline respondents.

TABLE 5
Location of council member residence and educational attainment

	Council member finished high school		
	(1)	(2)	(3)
Natural log of distance between council member's residence and village centre	−1.21 [1.18]	−2.51** [1.24]	−2.34* [1.23]
At-large election * natural log of distance between council member's residence and village centre	5.13** [2.27]	5.43** [2.24]	4.86** [2.22]
At-large elections	7.53*** [2.45]	7.69*** [2.47]	7.62*** [2.36]
Natural log of median distance between residences of villagers		4.28** [1.70]	4.52*** [1.73]
Share of baseline survey respondents who Finished high school			48.25* [26.10]
Quadruple fixed effects	Yes	Yes	Yes
p-value for effect of distance in at-large villages	0.045	0.151	0.210
Observations	857	857	857
R^2	0.21	0.21	0.22

Notes: The unit of observation is council member. The dependent variable is a dummy that equals 100 if a council member finished high school and zero otherwise. Natural log of distance between a council member's residence and village centre is demeaned. Standard errors clustered at the village level in parentheses. Significant at * 10%; ** 5%; *** 1%.

The findings are consistent with the fifth empirical prediction. The distance between the homes of elected representatives and the centre of the respective village is indeed significantly higher in villages that have elected educated representatives (see columns (3–5) in Table 4). The effect in at-large elections is highly statistically significant and robust to controlling for village size and villagers' educational attainment. The effect is large in magnitude, suggesting that, controlling for the village's geographic size, the distance to the homes of elected representatives in such villages was lower by one half.[51] In district elections, the distance to the homes of elected representatives is higher in villages that elected educated representatives, but the effect loses statistical significance once we control for the village's geographic size. Thus, the results provide support for the fifth prediction of the model.

The sixth empirical prediction posits that, in district elections, there will be a negative correlation between a representative's competence and the extremity of his/her policy preferences. We test this prediction by estimating the following model:

$$\text{Education}_{vi} = \alpha + \varphi \cdot AL_v + \rho \cdot AL_v \cdot \text{Distance}_{vi} + \kappa \cdot \text{Distance}_{vi} + \phi_q + \varepsilon_{vi}, \qquad (7)$$

where all the variables are the same as in the previous equations. The empirical prediction posits that $\kappa < 0$ and $\rho + \kappa = 0$.

The findings indicate that, in district elections, there is a negative correlation between a representative's education and the distance between his house and the centre of the village, although it becomes statistically significant only when controlling for village size (Table 5). In addition, the difference between the effects of distance in villages with at-large and district elections is positive and statistically significant, confirming that $\rho > 0$. We also find that, in at-large elections, the correlation between a representative's educational attainment and the distance between the representative's house and the centre of the village is positive (rather than zero, as

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51. The number is obtained by taking the exponent of the coefficient in column (4) of Table 4.

TABLE 6

Effect of electoral rules on on the speed of project implementation

Panel A	Days between elections and project start				
	(1)	(2)	(3)	(4)	(5)
At-large elections	−40.05**	−42.91**	−39.25**	−37.40**	−36.27**
	[16.29]	[16.85]	[16.79]	[16.99]	[16.92]
Number of projects in a village			18.07*	10.45	10.49
			[10.72]	[11.65]	[11.71]
Log (budget of the project in USD)				−35.13***	−35.15***
				[13.34]	[13.39]
Share of baseline survey respondents who finished high school					−175.80
					[149.33]
Type of project fixed effects	No	Yes	Yes	Yes	No
Quadruple fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	478	478	478	478	478
R^2	0.34	0.35	0.36	0.38	0.38

Panel B	Days between elections and project completion				
	(1)	(2)	(3)	(4)	(5)
At-large elections	−33.94*	−35.23*	−32.13*	−32.74*	−31.55*
	[18.11]	[18.40]	[18.43]	[18.38]	[18.18]
Number of projects in a village			15.29	17.77	17.81
			[10.86]	[11.24]	[11.31]
Log (budget of the project in USD)				11.45	11.43
				[13.35]	[13.31]
Share of baseline survey respondents who finished high school					−185.92
					[189.11]
Type of project fixed effects	No	Yes	Yes	Yes	No
Quadruple fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	478	478	478	478	478
R^2	0.38	0.40	0.40	0.40	0.41

Notes: The unit of observation is project. The dependent variable in (1)-(4) measures the number of days between the council election and the start of a project. The dependent variable in (5)-(8) measures the number of days between the start of the project and the day the project was finished. Standard errors clustered at the village level in parentheses. Significant at * 10%; ** 5%; *** 1%.

implied by the model), but it loses statistical significance once we control for the geographic size of the village.[52] Thus, the results provide support for the sixth empirical prediction, although only in the specification that controls for the village's geographic size.

The seventh empirical prediction posits that the speed of project implementation will be higher in at-large elections. To test this hypothesis, we estimate the following OLS model:

$$\text{Progress}_{jv} = \alpha + \lambda \cdot AL_v + \phi_q + \varepsilon_{jv}, \tag{8}$$

where Progress_{jv} is either time to project start or time to project completion and all other variables are the same as in equation (3). According to the seventh empirical prediction, $\lambda > 0$.

The results indicate that, in villages with at-large elections, project implementation started earlier and, as a result, was completed faster (Table 6). The results hold if we control for the

52. We also find that, for the random sample of villagers in the baseline survey, there is no significant relationship between their education and the distance from their houses to the centre of their village.

number, cost, and type of projects and thus do not appear to be driven by an indirect effect of electoral rules on the type of projects selected.[53] The magnitude of the effect is substantial, with projects starting and finishing more than a month earlier in villages with at-large elections. A comparison of the distribution of dates for project commencement and completion by type of elections (Figures C2 and C3 in Supplementary Appendix C) indicates that the difference in the speed of project completion reflects a shift in the distribution, rather than the effect of a few outliers. The results are thus consistent with the seventh empirical prediction.

The eighth and final empirical prediction posits that the effectiveness of development projects, improvements in general economic welfare, and increases in support for local leaders and democratic processes will be higher under at-large elections. To test this prediction, we estimate the following model:

$$Y_{vit} = \alpha + \gamma_1 \cdot AL_v \cdot \tau_{1t} + \gamma_2 \cdot AL_v \cdot \tau_{2t} + \phi_q \cdot \tau_{1t} + \phi_q \cdot \tau_{2t} + \varepsilon_{vit},$$

where Y_{vit} is the outcome of interest for individual i in village v at time $t \in \{1, 2\}$ which corresponds to the midline and endline surveys, respectively; τ_{1t} and τ_{2t} are dummies for the midline and endline surveys; all other variables are the same as in equation (3). Thus, the coefficients γ_1 and γ_2 measure the effect of at-large elections on the outcomes of interest at the time of the midline and endline surveys, respectively. Standard errors are clustered at the village level.

Estimates using data from the endline survey, which was administered approximately 4 years after the election of the village developments councils and 1–2 years following the completion of NSP-funded projects, indicate that villages assigned at-large elections exhibited lower levels of diarrhea among children (see Panel A of Table 7) and thus had water sources more likely to be free of contaminants.[54] We also observe that at-large elections induced a marginally significant increase in revenue derived from the harvest prior to the endline, which may reflect more successful implementation of irrigation projects. The signs of coefficients for other indicators of the effectiveness of development projects (reported water quality, hours of electricity available, yield of the most recent harvest) are consistent with at-large elections producing better project-related outcomes, although none of these attain conventional levels of statistical significance. The results for the summary index confirm that at-large elections had a positive effect on economic and political outcomes both at midline (statistically significant at the 10% level) and endline (statistically significant at the 5% level). Overall, there is some evidence that the quality of implemented development projects was higher in villages assigned to at-large elections and no evidence that the faster implementation of projects in at-large villages came at the sacrifice of project quality.

Estimates using data from the midline survey, which was administered approximately 2 years after council elections, indicate that female respondents in villages assigned to at-large elections were more likely to express positive perceptions of the economic situation and were more likely to attribute positive economic changes to local leaders (see Panel B of Table 7). However, there is no such effect for male respondents at midline or endline or for female respondents at endline. Data from the endline survey also indicate that there is a marginally significant positive effect

53. There is some evidence that the number of projects is smaller and the cost of projects is higher if councils are populated by more educated representatives. This potentially suggests that more competent candidates are able to implement more complex projects and, in turn, may explain why there is no statistically significant effect of electoral rules on the duration of projects.

54. Note that not all villages implemented drinking water projects. However, restricting the sample only to villages that implemented drinking water projects would potentially confound the estimation of the effects of electoral rules given the endogeneity of project choice.

TABLE 7
Effect of electoral rules on economic and political outcomes

Dependent variable:	At-Large elections * midline	Standard error	At-large elections * endline	Standard error	Obs.	R^2
Panel A. Benefits delivered by projects						
(1) Seasons in past year water was of poor quality	−0.074	[0.092]	−0.056	[0.091]	3,806	0.14
(2) Child suffered diarrhea in past 2 weeks			−0.049**	[0.021]	1,229	0.11
(3) Hours of electricity in past month (winsorized and logged)	0.141	[0.177]	0.210	[0.189]	4,464	0.42
(4) Yield of most recent harvest (tons, winsorized and logged)	0.123	[0.207]	0.051	[0.033]	2,954	0.74
(5) Revenue from most recent harvest (winsorized and logged)	0.171	[0.165]	0.246*	[0.134]	2,926	0.40
Panel B. General economic outcomes						
(6) Economic situation has improved in past year (female respondents)	0.045*	[0.026]	−0.016	[0.019]	3,997	0.15
(7) Economic situation has improved in past year (male respondents)	−0.008	[0.024]	−0.012	[0.018]	4,493	0.19
(8) Respondent attributes positive economic change to local leaders or council (female respondents)	0.013**	[0.006]			2,135	0.04
(9) Respondent attributes positive economic change to local leaders or council (male respondents)	−0.003	[0.008]			2,355	0.08
(10) Income earned in past year (winsorized and logged)	−0.015	[0.030]	0.005	[0.033]	4,439	0.20
(11) Annualized consumption (winsorized and logged)	0.030	[0.035]	0.067*	[0.034]	4,172	0.17
Panel C. Political outcomes						
(12) Desired change in decision of influential villagers in past year (female respondents)	0.003	[0.007]	0.004	[0.008]	3,980	0.07
(13) Desired change in decision of influential villagers in past year (male respondents)	0.009	[0.009]	−0.022**	[0.009]	4,495	0.05
(14) Complaint about project			−0.023	[0.031]	1,716	0.21
(15) Complaint about corruption or nepotism related to projects			−0.008	[0.018]	1,722	0.16
(16) Prefers election to select headman (female respondents)	−0.010	[0.028]	−0.020	[0.031]	3,578	0.12
(17) Prefers election to select headman (male respondents)	0.051**	[0.025]	0.016	[0.022]	4,440	0.23
(18) Prefers selection of president by secret ballot election (male respondents)			0.025**	[0.012]	2,112	0.07
Summary index	0.034*	[0.019]	0.038***	[0.018]	4,499	0.54

Notes: Each row represents a separate regression. Measures are based on answers of villagers to surveys conducted approximately two years (midline) and four years (endline) after council elections. Some of the questions were asked only during one of the surveys, so the coefficients for the other survey is not available. Standard errors clustered at the village level in parentheses. Significant at * 10%; ** 5%.

of at-large elections on household expenditures. The effect of at-large elections on household income at endline is also positive, although not statistically significant. Overall, there is weak evidence that at-large elections improve general economic welfare.

Estimates using data from the endline survey indicate that, in villages assigned at-large elections, male respondents were less likely to express a desire to change decisions made by village leaders and were more supportive of using democratic procedures to select the President of Afghanistan (see Panel C of Table 7). Data from the midline survey indicate that male villagers in at-large villages were more likely to support the election of the village headman, but that the effect decreases in magnitude and loses statistical significance at endline. The results for other indicators are not statistically significant, although the signs of all coefficients for measures of support among male villagers for local leaders and democratic processes are consistent with the hypothesis that at-large elections improve villager attitudes. Overall, there is weak evidence that at-large elections resulted in improved attitudes towards village leaders and democratic processes.

On the whole, estimates using measures of villager welfare and opinion from the midline and endline surveys are weakly consistent with the eighth empirical prediction. However, as the data used to produce these estimates are subject to the imprecision associated with household surveys and describe processes and outcomes over which representatives of the village development councils potentially have limited influence, these estimates are likely attenuated by measurement error. At a minimum, the results show that the faster implementation of projects in villages assigned to at-large elections does not come at the cost of lesser quality projects.

7. DISCUSSION

According to our theoretical model, electoral rules affect the competence of elected representatives by changing voter incentives to support candidates with more extreme policy preferences over more qualified candidates. The results from the field experiment are consistent with the predictions of the theoretical model. In particular, we find that the competence of elected representatives is higher in villages assigned to at-large elections and that this difference is higher in more heterogeneous villages. There is also evidence that, in more heterogeneous villages, district elections lead to the election of representatives with more extreme policy preferences and lower levels of competence.

There are several possible alternative explanations for the positive effect of at-large elections on the quality of candidates. First, the effect may be a mechanical product of the geographic restrictions imposed by district elections on candidate selection, which precludes the election of multiple competent candidates residing in the same electoral district. This geographic restriction could also explain the effect of electoral rules on the location of council members' houses. The viability of this explanation is explored by examining the distribution of elected council members across districts. As prescribed, villages with district elections had exactly one male representative elected from each district. Although at-large elections imposed no formal restrictions on the geographic distribution of representatives, the distribution was similar to that in villages with district elections. Specifically, in villages with at-large elections, 93% of districts had a person residing in that district elected to the council. Only thirty-seven out of 125 at-large villages had at least one district which did not have a resident council member and, of these, twenty-five villages had only one district that did not have a resident representative. Thus, the effect of at-large elections on the probability of a district not having a resident council member was very small.[55]

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55. Note that absence of an effect of electoral rules on the distribution of candidates across districts is consistent with the result that the distance between a council member's house and the village centre is larger in district elections.

To further test the viability of the explanation, we exclude from the sample representatives from those districts that, in at-large elections, had more than one representative elected to the council.[56] Thus, we look only at the quality of candidates for whom the geographical restriction was not binding. While the results are to be interpreted with caution given the endogeneity of the restriction, we find that the sample restriction has no effect on estimates obtained by the benchmark specification (Table C6 in Supplementary Appendix C). Also, the restriction on candidates' residence in district elections should matter more in smaller villages. However, empirical results indicate that the effect of electoral rules on the quality of candidates is stronger in larger, rather than smaller, villages. Furthermore, we do not observe geographic clustering of educated villages in the baseline data. In particular, Figure C4 in Supplementary Appendix C shows that there is no evidence of concentration of educated people in specific parts of a village as measured by quartiles of the distance to the village centre. There is also no differences in education if we compare education by terciles or by the median of the distance.[57] Finally, although the mechanical effect of geographic restrictions could explain some of our results, it cannot explain why the effects of electoral rules depend on the heterogeneity of villages (Table 3) or why electoral rules affect the education of council members living close to the village centre differently from those living far from it (Table 5). Overall, although the mechanical effect of geographic restrictions may be a plausible explanation for some results, it does not seem to be empirically relevant as it cannot explain all the results.

Another alternative explanation is that electoral rules affect the probability that members of the pre-existing elite are elected to village councils and, in so far as elite members are more educated than average villagers, this might explain the results. For example, the larger district magnitude associated with at-large elections can make it harder for pre-existing elites to coordinate voting, which in turn reduces their electoral advantage. Assuming that members of pre-existing elites are less qualified than potential challengers, this would increase the quality of elected representatives. The viability of this explanation is explored by examining the share of council members who were members of the pre-existing elite. To identify members of the pre-existing elite, we use several alternative measures based on the information collected from villagers in the baseline survey administered prior to council elections. First, we define as elite members all the participants of the male focus group, as well as people who were supposed to be part of the focus group but could not attend the meeting. The male focus group was comprised of between six and nine of the most important male leaders in the village, usually members of the male village *shura / jirga*.[58] In addition, all respondents of the male head of household survey, and participants of the male and female focus groups were asked to indicate up to three most important decision makers in the village. Based on this information we construct three alternative measures of pre-existing elite, defined as those villagers mentioned as important decision-makers by each of the three groups of respondents. Finally, we use an inclusive definition of pre-existing elites, which considers a person a member of the pre-existing elite if he fulfills any of the four abovementioned definitions.

An important observation is that the share of council members that were members of the pre-existing elite, even if we use the most inclusive definition, is 39%, which indicates that

Indeed, our model predicts precisely that: electoral rules affect the position of elected members within districts, but not their distribution across districts.

56. Ideally, we would exclude districts with more than one candidate of high quality, but since all villagers are considered candidates and we do not have a full census of the villages, we cannot implement this strategy.

57. Unfortunately, we do not have information on the exact district borders, so we cannot match the location of the houses of baseline respondents with electoral districts to show a similar distribution by electoral districts.

58. In particular, enumerators were instructed to request the participation of all of the regular members of the village council in the focus group. If no village council existed in the village, enumerators were instructed to convene a meeting of the village headman and other residents of the village that were identified as local power holders by the villagers.

pre-existing elites did not dominate the elected council. The results indicate that regardless of the measure, electoral rules have no significant effect on the share of council members who were considered members of the pre-existing elite (see Table C7 in Supplementary Appendix C). Only one measure provides a marginally significant positive effect of at-large elections on the share of council members who were named as members of the pre-existing elite. Similar results are obtained if we look at the proportion of pre-existing elite members who were subsequently elected to the council, with no significant difference between villages that used alternative electoral rules.

Yet another potential explanation is that educational attainment serves as a proxy for candidate competence if voters do not have precise information. In district elections, the size of the districts is smaller and voters are likely to have better information about candidates, so they do not need to rely on proxies such as educational attainment. In at-large elections, by contrast, the larger size of districts leads to greater reliance on educational attainment as a proxy for candidate competence. While this interpretation could potentially explain the observation that at-large elections are associated with more educated representatives, it does a poor job of explaining why the results are stronger in more heterogeneous villages and why the educational attainment of elected representatives is on average lower in more heterogeneous villages. Specifically, in more heterogeneous villages, voters are likely to have less information on candidates, so according to this explanation voters should rely on formal education more. In addition, this explanation cannot account for the results on the locations of the elected representatives' homes.

Differences in the competence of elected representatives may be due to citizens' inability to coordinate on voting for competent citizens (Myerson, 1993), if this problem is more pronounced in district elections. We cannot rule out that this effect played some role. Yet, this explanation alone is inconsistent with the results on heterogeneity and village size. Indeed, miscoordination is, arguably, more likely in more heterogenous villages, but there is no reason to believe that smaller districts are affected more than larger districts. Likewise, as village size increases, lack of coordination may become more likely in at-large elections, but since the size of districts in district elections stay roughly the same (only their number increases), the effect of at-large elections should diminish with village size, which is not what we see in the data. Finally, this explanation does not explain the results on the locations of the representatives' houses.

The observed correlation between at-large elections and representatives' competence may also be driven by the advantage given by at-large elections to competent candidates for reasons other than voting decisions by citizens. For instance, if candidates garner support through rallies (public speeches) and bribes (vote buying) during the campaign and public speeches are more important in larger districts due to economies of scale, competent candidates will be advantaged in at-large elections if they have a comparative advantage in public speaking (and a comparative disadvantage at vote buying).[59] This explanation, while attractive theoretically, cannot explain the results of the field experiment, as political campaigning was forbidden and election monitoring indicated no evidence of vote buying. In addition, this story does not imply any correspondence between electoral rules and the location of representatives' houses, which contradicts the experimental results.

An important issue to note is the level of attrition both at the village and individual level data. To assess the extent to which our estimates of the effect of at-large elections could be affected by this attrition, we calculate lower and upper bounds for the effects using the non-parametric approach by Lee (2009). The results presented in Table C8 in Supplementary Appendix C indicate that the effects of elections on the competence of elected council members, the distance of their residences from the village centre and the time between elections and the start and completion

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59. This explanation relies on a strong assumption that higher quality candidates are relatively better at speaking and not at bribing, which may or may not be true.

of the projects are all robust and even the lower bounds for these effects are only slightly smaller and statistically significant at the same level as the benchmark results.[60] The only effect that loses statistical significance is the lower bound for the effect of election method on the summary index of economic and political outcomes at midline, whereas the effect at endline becomes statistically significant only at the 10% level. Unfortunately, using this method we can only assess the lower and upper bounds for the direct effect of election method on the outcomes of interest and we are not aware of alternate rigorous methods of establishing bounds on the interaction effffects introduced by data attrition. However, this analysis suggests that at least the results on the direct effects of the election method are not likely to be significantly affected by existing data attrition.

8. CONCLUSION

This article examines the effect of electoral rules on voting behaviour and, by extension, on the composition of representative bodies and the quality of policy. We compare two alternative electoral rules: district elections, with multiple single-member districts, and at-large elections, with a single multi-member district. Employing a theoretical model which builds on a citizen-candidate model with free entry of candidates and which assumes that voters value both competence and preference representation in electoral candidates, the article posits that elections with a single multi-member district will result in the election of more competent representatives, with this effect becoming stronger in more heterogeneous communities. Empirical results from a field experiment conducted across 250 villages in Afghanistan are consistent with these predictions. Ancillary evidence suggests that these results are driven by strategic voting behaviour informed by voters' anticipation of policy bargaining and not by alternative mechanisms such as incumbency advantage or comparative advantages in political campaigning.

The article's theoretical model imposes a series of simplifying assumptions. For instance, in order to enable a focus on the choice of voters over an exogenous set of candidates, the model assumes that candidates face zero entry costs.[61] In addition, the model assumes only a portion of candidates are competent to hold office.[62] Furthermore, the experiment that tested the model's predictions occurred in a special institutional context that differed from those in which elections are ordinarily held, such as in the absence of political parties, campaigns, or canvassing; in the limited role of long-term considerations for candidates; and in the limited mandate of the representative body. In our empirical setting, the two electoral systems differ in both district magnitude and number of votes cast for individual candidates. In other contexts, single-member districts and larger magnitude districts may differ along other dimensions (such as presence of party lists in multi-member districts) which may affect participation in elections or subsequent bargaining in the legislature. These assumptions and contextual peculiarities notwithstanding, the results of the article provide a number of general implications.

First, the article establishes the general result that electoral rules, by structuring the strategic incentives facing voters, condition voting behaviour. The theoretical model demonstrates that rational voters will behave differently according to the district magnitude of the election in which

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60. Note that since the approach of Lee (2009) is based on a specification that includes only the treatment dummy, we first regress outcomes of interest on quadruple fixed effects and then use the residuals as the dependent variable, which explains a small divergence in the magnitude of the effects in Table C8 in Supplementary Appendix C as compared to the benchmark results. For villages for which the information on the number of male council members elected is missing, we assume this number to be eight, for example, the mean council size.

61. The endogeneity of candidate selection is addressed in the existing literature (Myerson, 1993).

62. The assumption of a scarcity of competent individuals is consistent with previous work positing negative selection of candidates (Caselli and Morelli, 2004; Mattozzi and Merlo, 2008). Our finding that strategic voting reduces the election of competent individuals suggests an additional mechanism for negative selection.

they are voting and the results of the experiment align with how voters should behave given the incentives presented to them by electoral rules.

Secondly, the article shows that strategic voting results in the selection of candidates with relatively extreme policy preferences. The theoretical model suggests that voters anticipate bargaining over policy and seek to elect candidates with relatively extreme policy preferences in order to ensure a policy outcome that is more likely to be favourable to the voter's specific interests. The results of the experiment confirm that voters engage in such strategic behaviour.

Thirdly, the article demonstrates that voter preferences for candidates with relatively extreme policy preferences increase with heterogeneity over policy preferences of voters across electoral districts. That is, in cases where there is high dispersion of policy preferences among voters, voters anticipate other voters' more extreme preferences and the deleterious consequences of the achievement of their policy ideal point, resulting in a preference for candidates with more extreme policy preferences.

Fourthly, the article shows that elections with multiple single-member districts cause voters to focus on geographically correlated aspects of policy preferences, such as the location of local public goods, and to elect candidates that can be expected to best represent the preferences of the district. In contrast, elections with single multi-member districts reduce the salience for voters of geographically correlated policy preferences and cause voters to focus on other candidate characteristics. Although the model assumes full segregation in terms of political preferences across political districts, qualitatively the results hold as long as political preferences are geographically correlated within electoral districts (see also footnote 24). Empirical evidence suggests that political preferences are indeed highly geographically correlated in many countries around the world (Rodden, 2010).

Fifthly and finally, the theoretical model and empirical findings support the general implication that single multi-member district elections better enable the realization of voters' full set of preferences, while multiple single-member district elections unduly magnify the importance of preferences over geographically correlated policies.

A limitation of our results, however, is the focus on policy aspects of representation. In addition to the task of bargaining over policy and facilitating policy implementation, elected representatives are also often tasked with providing constituents with various intangible services, such as assisting them in the navigation of bureaucratic processes and advocating on behalf of individual constituents or groups of constituents. It is certainly possible and indeed probable that the structure of direct representation provided by multiple single-member district elections may be more conducive to the provision of such services, as compared to the less direct systems of representation provided by single multi-member elections. To the extent to which citizens derive utility from receiving such services and to the extent to which there is ambiguity in the effects of the two election systems considered here on the provision of such services, the results of the article cannot speak to welfare implications of the two election systems that extend beyond the policy function of elected representatives. An important area for future research is thus to extend the analysis to consider these aspects of representation. In addition, future research can shed light on how the mechanisms outlined in this article play out in settings with endogenous candidate entry by candidates, repeated elections, active political campaigns, and political parties playing the role of intermediaries.

Supplementary Data

Supplementary data are available at *Review of Economic Studies* online.

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