

Improving Educational Quality through Enhancing Community Participation:  
Results from a Randomised Field Experiment in Indonesia<sup>1</sup>

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January 2011

**Abstract**

This study evaluates the effect of four randomized interventions aimed at strengthening school committees, and subsequently improving learning outcomes, in public primary schools in Indonesia. All study schools were randomly allocated to either a control group receiving no intervention, or to treatment groups receiving a grant plus one or a combination of three interventions: training for school committee members, a democratic election of school committee members, or facilitated collaboration between the school committee and the village council, also called linkage. Nearly two years after implementation, we find that measures to reinforce existing school committee structures, the grant and training interventions, demonstrate limited or no effects; while measures that foster outside ties between the school committee and other parties, linkage and election, lead to greater engagement by education stakeholders and in turn to learning. We see test score improvements in Indonesian by 0.17 standard deviations for linkage and 0.22 standard deviations for linkage+election. The election intervention alone leads to changes in time household members accompany children studying per week, but this does not lead to learning. Linkage is the most cost effective intervention, causing a 0.13 change in standard deviation in Indonesian test scores for each 100 USD spent.

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<sup>1</sup> A large number of people contributed to the design, implementation and supervision of this research project. From the Indonesian Ministry of National Education: Bambang Indriyanto, Sri Renani Pantjastuti, Sri Amien, Dasim Budimansyah, Agus Haryanto, Yadi Haryadi, Neneng Kodri, Suparlan, Anen Tumanggung, Yudistira Widiasana, Diana Sufa, Ismulyanto Apriwibowo. From the World Bank and affiliates: Vivi Alatas, Armida Alisjahbana, Desmond Ang, Chris Bjork, Esther Duflo, Scott Guggenheim, Djoko Hartono, Dedy Junaedi, Siswanto, Rosfita Roesli, Chris Thomas, Jeremy Tobacman, Tri Yuwono. We are grateful to Matt Stevens, Deborah Cobb-Clark, Tue Gørgens, Andrew Leigh, Matthew Grant Wai-Poi, Astid Zwager and seminar participants at the Australian National University, Tinbergen Institute and CEPR development economics seminar for helpful comments and suggestions. We acknowledge financial support from the Japan Social Development Fund, and the Dutch Government. The firm PPA and Moores Roland implemented the intervention and survey respectively. The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors. They do not necessarily represent the views of the International Bank for Reconstruction and Development/World Bank and its affiliated organizations, or those of the Executive Directors of the World Bank or the governments they represent.

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## **I. Introduction**

As school enrollment and attainment rise across developing countries, policymakers are increasingly directing attention to interventions that affect student learning. After achieving universal primary school enrollment in the 1980s (current gross enrollment is 110 percent), Indonesia also began to shift attention to quality with reforms such as teacher training and upgrading, curricula revision, facility improvements, and later on school-based management (Kristiansen and Pratikno (2006)).<sup>2</sup> Despite these initiatives, Indonesia awaits marked progress in learning. In reading, it ranks 57<sup>th</sup> out of 65 countries that participated in the Program for International Student Assessment (PISA) in 2009 (OECD (2009)); and in the Trends in International Mathematics and Science Study (TIMSS) 2007 (Mullis, Martin and Foy (2008)), only half of Indonesia's students performed above the lowest international benchmark. Hanushek (2008) also finds that just nearly 30 percent of a cohort of grade nine Indonesian students had achieved full literacy.

Lack of accountability between education providers and consumers resulting in low quality of service provision is part of the underlying problem. Using a crude measure of quality, teacher absenteeism, a comparative study in six developing countries found on average 19 percent of teachers absent during school operating hours (Chaudhury, Hammer, Kremer, Muralidharan and Rogers (2006)). This figure is 15 percent for Indonesia (SMERU (2008)). One prominent method of addressing these deficiencies in service provision is by making schools accountable for performance. The World Development Report (World Bank (2003)) calls for greater accountability and client monitoring of school management, and argues that poor people are best served when they have the information and power to influence service delivery.

Reforms that fall under the umbrella of promoting accountability and school-based management largely vary by which body holds decision-making power or influence (Barrera, Fasih and Patrinos (2009)). Different models may include merely providing stakeholders such as parents and community members with information about their rights and responsibilities, and about the general state of education in their community; training stakeholders in how to use this information; delegating to stakeholders, such as a school committee, a specific power or task, such as the right to hire and fire contract teachers or the responsibility for monitoring teacher performance; or allowing local authorities, such as a school committee or the principal, to determine the use of school resources.

In 2006, the Government of Indonesia, Ministry of National Education (MoNE) became interested in testing several models, with the goal of realizing aspirations of school-based management and accountability outlined in a 2002 decree. The Ministry's interest led to this pilot study examining the impact of four improvements to school committees: a block grant, committee training, democratic election of committee

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<sup>2</sup> Calculated using SUSENAS 2009. Enrollments dipped below 100 percent during the 1997-98 crisis, but returned to pre-crisis levels in the 2000s.

members, and collaboration between the committee and local government (called linkage). Pilot schools were randomly allocated to receive only a grant, to receive a grant plus training, election or linkage, or to a comparison group that did not receive any intervention. Departing from many randomized experiments in developing countries, this study was designed and supervised by MoNE, which will hopefully allow results to inform Government policies. The study took place in 520 randomly selected rural schools in 6 districts in Central Java and Yogyakarta, Indonesia, over a two year period starting in 2007.

### *Study design in international comparison*

Comparing the interventions tested here to those piloted in other countries, we find a body of evidence about grants and training offered to school governance organizations. Gertler, Patrinos and Rubio-Codina (2008), Gertler, Patrinos and Rodríguez-Oreggia (2010), Khattri, Ling and Jha (2010) and Blimpo and Evans (2010) highlight programs featuring grants and training, with modest impacts. In all of these studies, some kind of school committee, comprised of teachers, principals, parents and/or community members, was provided with training, and money to be used for school-level projects, usually infrastructure or materials, but occasionally also locally-hired teachers. In the Gertler (2008 and 2010) evaluations in Mexico, parent associations received grants, and training in funds management, school learning levels, and participation in school-based management. In the earlier 2008 evaluation, grants were \$500 to \$700. Along with training, this package led to a decline in repetition and failure rates of five percent, with no effect on dropout rates. A later 2010 evaluation in the same context doubled the amount of grants to parent associations. Some groups received training plus the smaller grant, and other groups training plus the larger grant. Here the larger grant had an impact on the dropout rate, and Spanish and math learning (five to eight percent increase in test scores), yet no effect on failure or repetition rates.

Khattri, Ling and Jha (2010) also show positive impacts from a combination of training and grants in the Philippines. Principals and head teachers received training in developing and implementing a school improvement plans, which were to be developed in conjunction with parents and community members; and beneficiary schools received funding for maintenance and operating expenses. The analysis shows a 1.5 percentage point difference in test scores in schools that received the intervention. Blimpo and Evans (2010) look at the same combination in the Gambia, but are also able to separate effects of grant versus training, or rather grant alone and grant plus training. Principals and community representatives received training in school leadership and management, community participation and teacher professional development, just to name a few. Schools were to use approximately \$500 for initiatives related to teaching and learning. While neither intervention showed an effect on learning, with the grant plus training intervention, there was a change in grade 1 enrolment, and other aspects of school-based management, such as establishing school management committees.

Nguyen and Lassibille (2008), Banerjee, Banerji, Duflo, Glennerster and Khemani (2010), and Bjorkman and Svensson (2009) showcase examples of mobilizing communities to enhance service provision, somewhat similar to the linkage intervention tested in Indonesia, because of its objective of fostering ties beyond the school committee. The distinction with these evaluations is that they are generally not targeted at strengthening an existing school-level body, but rather providing training and information to the community, such as parents. In these evaluations, training or information, such as information about the state of public service delivery, were in some cases combined with a specific task for community members.

Nguyen and Lassibille (2008) show results for training three levels of education stakeholders in Madagascar – district administrators, subdistrict administrators, and parents and teachers. Providing parents with school report cards and information about what parents can do to improve the quality of education, and offering pedagogical and administrative tools to teachers, prompted a 0.1 standard deviation increase in test scores and improvements in student attendance. While training and information dissemination at administrative levels showed little impact other than administrators using the management tools provided.

Banerjee, Banerji, Duflo, Glennerster and Khemani (2010) offer another example of testing approaches with different groups of education stakeholders in India. They looked at simply disseminating information, through small and large group meetings, about rights and responsibilities regarding education generally, and specifically responsibilities of a village education committee, comprised of parents, village government and the head teacher. These sessions did not include specific recommendations on how to improve education. Another intervention involved these information sessions, and community training on how to assess student reading and arithmetic levels. Learning results were compiled in a report card about the state of learning in the village. The third intervention involved the latter two, but also recruiting and training volunteers in how to teach the low-performing students reading. While all interventions improved some knowledge at the village level, the third was the only one that improved learning. Both the India and Madagascar examples bolster arguments for local-level support being the route to improved education performance.

In another promising example of local-level engagement, Bjorkman and Svensson (2009) show impressive benefits from a health-related information campaign in Uganda. NGOs organized meetings with community members and health service providers about the level of services in the village, and provider responsibilities. The two parties then formulated an action plan for service improvement, with which community members were tasked with monitoring compliance. As a result, communities saw improvements in service utilization, quality of service delivery and health outcomes, such as infant weight and child mortality.

### *Summary of findings*

Comparing international evidence to the model we test in Indonesia, our findings are consistent with, if not more modest than other training and grant interventions. Interventions that served to reinforce existing school committee structures demonstrate limited success in this context. In contrast, the initiatives to foster outside ties between the school committee and other parties -- linkage and election -- were more successful, yet to our knowledge have no direct international comparisons. Instead, the election and linkage interventions can be compared to examples such as Nyuyen and Lassibille (2008), Banerjee et. al (2010), and Björkman and Svensson (2007) that show varying degrees of success from community and local-level engagement.

We find that linking school committees with the village council is the only intervention that by itself—as opposed to combining with other interventions—improves Indonesian learning, by 0.17 standard deviations. We find no effect on math scores except among girls, whose math scores improve by 0.11 standard deviations as a result of the linkage intervention. The analysis of the intermediate outcome variables indicates that the linkage intervention indeed led to increased collaboration between the school committee and the village council. This additional support from the community is also observed by parents. However, although this intervention was designed to enhance the role of the school committee, quantitative and complementary qualitative analysis by Bjork (2009 ) indicates that it does not achieve this. The qualitative research suggests that the intervention has little effect on enabling the school committee, and instead enforces existing power relations in the community, often by electing or appointing village council members to serve on the school committee. This, suggests that linkage had an effect from bypassing the school committee, rather than working through it.

We find that elections alone raise overall awareness about the school committee, promote respect for the school committee in the eyes of the teachers, and increase time household members help their children with homework. In combination with linkage, the intervention increases Indonesian scores by 0.22 standard deviations. It seems that election intervention causes more effort by teachers, largely effort spent outside the classroom.

The grants to school committees help to raise awareness of parents about the school committee and its members, and increase internal meetings of the school committee; but do not yield results related to learning. Training, even though it is the most costly intervention, has the smallest impacts. Thus, these results depart from evidence highlighted above on the impacts from internally strengthening school committees. Khattri et. al (2010), and Gertler et. al (2010) see changes in learning as a result of training and money. We find little to no effect from grant and training interventions, other than small movements in school committee engagement, consistent with Blimpo and Evans (2010).

In the following section we discuss the motivation for the field experiment, and describe the interventions in detail. Section III outlines the sampling strategy, timing and what information was collected. We then present the approach used in the empirical analysis (section VI), followed by the results (section V). Section VI discusses results from a companion qualitative study conducted in a subset of the schools, and we conclude in section VII with interpretation and comparison of results with those from other countries.

## **II. Motivation, intervention design and implementation**

Against this backdrop of national efforts at promoting education quality discussed above, with the goal of empowering communities to hold educators responsible for quality, the Government embarked on bolstering school-based management via the school committee. It instituted a decree in 2002 that gave school committees a greater role in advising and supporting school management. The decree stipulated that school committees would replace existing school-level committees known as BP3 (*badan pembantu penyelenggaraan pendidikan*) in Indonesian. The primary function of the BP3 was to raise funds from parents and the community to support the school, yet the funds were largely handed over to principals. The school committee would go a few steps further, making recommendations on school expenditures, teacher qualifications, and school facilities. In addition, the school committee was expected to act as a mediator between the school and the community, and promote community, especially parental, involvement in the school.<sup>3</sup>

Although the decree had been passed in 2002, four years later the decree had had limited effect on the actual functioning of school committees – they were largely still operating under the BP3 model (Fearnley-Sander, Nainggolan, Ratcliffe, Riddell, Seper and Taylor (2008)). This result begged the question of what could be done to promote school-based management beyond the decree. The Ministry became interested in experimenting with approaches that might help school committees realize the role envisioned in the decree, yet were cost-effective and scalable. Field visits and further discussions with the Ministry regarding lessons learned from other education projects led to the development of four approaches tested as part of this experiment. Here we discuss the motivation for choosing each of the interventions, and how they were implemented in practice.<sup>4</sup> (See Figure 1 for the hypothesized pathways from the interventions to improved learning, Table 1 for allocation of schools to each intervention, and Table 2 for the study timeline.) This experiment was funded by a grant from the Japanese government to the Ministry, and the Ministry

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<sup>3</sup> In Indonesia, districts and central governments are largely responsible for teacher employment and deployment. At the school level, the headmasters and sometimes school committees would only have the authority to hire or fire contract teachers.

<sup>4</sup> Compliance with intervention assignment was relatively good, with the exception of the election intervention (see text), and two others: one school refused to participate at the outset, and another school refused to participate after the elections caused a conflict with the existing school committee.

contracted out intervention implementation to consulting firm, Pusat Pengembangan Agribisnis (PPA),<sup>5</sup> for a total contact value of 2.9 billion Rupiah (US\$315,000).

### *Intervention 1: Grant and facilitation*

The primary purpose of the grant intervention was to allow school committees an unprecedented role in decisionmaking about school resources. If one of the weaknesses of the school committee was that it lacked power over resources and in turn influence with school management, one solution might be providing committees with funding, albeit small, that would allow the school committee to organize meetings and finance some of its plans. Another objective of the grant was to "grease the wheels" in terms of re-energizing the school committee around project budgeting and planning that would serve to launch their other efforts at greater engagement with the school. Thus, all 420 treatment school committees received the block grant of eight million Rupiah (US\$870) with the intention of the grant complementing the three other treatments described below.

The school committee did not receive the money without strings, but rather was expected to develop (together with the village council for schools that received the linkage treatment, see below) a plan for expenditure, and the committee was required to be transparent by posting expenditure categories on the school notice board. The school committee developed an expenditure plan with the assistance of the facilitators supported by the project, who coached school committees on how they might address problems at the school with the block grant (but only those that could be implemented in two years, or the life of the experiment), approved expenditure proposals from school committees, authorized transfer of the block grant (once they approved expenditure proposals), ensured transfer of the grant to school committees' bank accounts, and monitored the use of the block grant. On average, one facilitator was assigned to ten schools, and visited each school committee 13 times.<sup>6</sup> Using these estimates on the number of visits, time facilitators spent in the schools, and staff salaries to break down the facilitation costs, and considering other treatment-specific costs, we estimate that the cost of implementing the grant was about US\$321 (excluding the grant itself) per school.

The eight million Rupiah (US\$870) block grant was transferred directly from the MoNE into a bank account held by the school committee, in two tranches, with the first tranche amounting to three million Rupiah (US\$326). This first tranche was disbursed in January 2008, three months later than planned, due to budgeting problems at the MoNE. The second tranche also confronted Government budgeting delays. It

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<sup>5</sup> The World Bank supported PPA by making available a consultant for about two months, with the task of assisting in the planning of the interventions.

<sup>6</sup> Based on interviews by the authors with two district facilitators after completion of the project. According to PPA, the project employed 50 facilitators for a period of 15 months, and six district facilitators who managed the district teams. The interventions were implemented consecutively – elections, linkage, and then training.

was to be disbursed to the schools subject to sufficient progress achieved by the school committee in using the first tranche of the grant; but, in practice, all schools received the second tranche, and received it ten months late, in December 2008, after the endline survey.<sup>7</sup> Thus, these results only measure the impact of the first tranche, and the anticipation of getting remaining funding.

### *Intervention 2: Training*

One other factor hypothesized by the Ministry team to be holding back school communities from realizing their role was their lack of knowledge about the decree, how to engage the community, how to play a role in school management, and how to promote student learning. Thus, a two-day, district-level training attended by four school committee members (principal, teacher, parent, and one village representative)<sup>8</sup> covered planning, budgeting and steps the school committee could take to support education quality. The budget session focused on a plan for spending the block grant. Materials drew heavily on the Creating Learning Communities for Children (CLCC) model developed by UNICEF,<sup>9</sup> which provides prolonged training and facilitation to schools on active learning, school-based management and community participation, and has served as the foundation for several donor projects promoting school-based management in Indonesia. Naturally, it was not replicated fully for this project because the cost per school for such intensive work would have been too high. The training also included a visit to a ‘model’ school committee that had been successful in applying school based management practices.

Schools receiving the training intervention received three additional visits beyond those provided with the grant. One visit was to announce the training and to agree on who would be participate; another to deliver an official invitation stamped by the district education office; and a final visit took place just before the training, to ensure that those invited would come. Implementing the training cost US\$360 (including cost of training) per school.

### *Intervention 3: Election*

The primary concern to be addressed by democratic elections of school committee members was that members were often handpicked by school management and did not represent parents or the broader community. With a democratic mandate and greater diversity in membership, it was hoped that the school committee would act in the interest of the parents with more authority and voice.

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<sup>7</sup> The endline survey had to be conducted before the second tranche was disbursed because the grant from the Japan Social Development Fund that financed the survey was about to expire.

<sup>8</sup> For the schools that also received the linkage treatment, one additional representative from the village council was invited.

<sup>9</sup> For more on Creating Learning Communities for Children, see [http://www.unicef.org/indonesia/resources\\_7230.html](http://www.unicef.org/indonesia/resources_7230.html).

The election intervention tries to help committees realize aspirations set out in the 2002 decree. The decree stipulated that the school committee was to include at least nine members, including community representatives (maximum of three from the village government), teachers, parents and the principal (although he/she cannot be the head); and the community must propose candidates. Moreover, the decree even envisioned that members would be elected by a voting election committee. However, in practice this committee was often chosen by principals, and candidates did not represent a variety of education stakeholders.

Thus, the innovation with this experiment was the inclusive process by which candidates and voters were identified, and how the election committee was convened and monitored. The election process<sup>10</sup> generally took facilitators five visits to schools beyond those necessitated by grant implementation, and included socialization and election committee selection at the school (one day), a community mapping of village human resources, community and parent meetings to select candidates (two days), a school committee meeting to elect new members (one day), and another meeting to sign a decree that established the committee and to develop a workplan (one day). The village human resource mapping involved village organisations and community leaders, and allowed groups to propose potential candidates as community representatives. Representatives at this meeting recommended five people per organization or group as potential candidates, who were then invited at the next community meeting. A similar, separate meeting was held for parents of children in grades one to five, where the desired qualifications of school committee members were discussed, and potential candidates suggested. If potential candidates were willing to stand, a vote was conducted to select the favoured candidate. Elections took place in three batches to spread out facilitator workloads,<sup>11</sup> and cost approximately US \$174 per school.

Despite the efforts of the implementer PPA to encourage communities to remain faithful to the design outlined above, some schools refused to conduct an election. As shown in Table 3, only 48 percent of the schools randomly selected to implement an election actually did as intended. Of those schools that didn't comply, about seven percent of committees refused to change any members, while the remainder of committees agreed to a compromise of electing representatives who were members of previously unrepresented groups. Some of those that refused or partially refused claimed that some school committees were only starting their terms, and thus they did not want to start over with new membership after a new pool had just been appointed or elected. Despite this partial noncompliance, elections indeed resulted in a higher share of new members being elected to school committees, as shown in Figure 1. The number of members in the school committee increased by about two as a result of the election, and the share of parent

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<sup>10</sup> The election process was modelled after that used in the Urban Poverty Project (UPP), known by the Indonesian acronym P2KP. The experience of UPP pilots, in which membership of village government was put to a popular vote, was that elites stood for election and were elected. Thus, the project modified election processes to mobilize candidates from different sectors of the community. This is the model that was used in this experiment.

<sup>11</sup> 15 April to 31 May 2007. 1 June to 14 July 2007. 15 July to 31 August 2007.

representatives increased. In the majority of the schools receiving this intervention, more than half of the school committee members were elected between baseline and endline, whereas in schools that did not receive the election intervention, hardly any new members joined the school committee during the course of this study.

#### *Intervention 4: Linkage*

Another concern raised by the Ministry and committee representatives was that school committees had no formal power to hold the school management accountable. Providing formal power to school committees as part of the experiment would have meant revising the decree or changing authority structures at the district level, which was not feasible at the time of design. But the design team thought it possible to implement a mechanism for providing school committees access to informal mechanisms of voicing concerns, raising the status of the school committees in the village, and better enabling committees to mobilise community support. A formal relationship with a local body potentially more powerful than school management -- the village council (known in Indonesian as *Badan Perwakilan Desa* or BPD) -- was that mechanism. In fact, the decree even envisions village representation in the school committee, but findings from field visits indicated, and baseline data confirmed, that there was little evidence of this collaboration. At baseline, only 22 percent of all school committee representatives reported collaboration with the village council, which rose to 57 percent for linkage committees by endline.

It was hypothesized that linking the school committee with the village council would increase the stature of the school committee vis-à-vis school management, improving the ability of the school committee to exert more influence to improve services. The facilitation accompanying the intervention could also help address community-level problems that could not be solved at the school. The intervention cost US \$125 per school, mainly covering the two additional visits to the school beyond those provided with the grant. The first facilitated meeting was between school principal and school committee members to identify measures for improving education quality that they would then propose to the village council. These measures were discussed in a subsequent meeting with village council representatives and other village officials, and the results of the meeting were documented in a memorandum of understanding signed by the head of the school committee, the head of the village council, and the school principal. Examples of measures that parties collaborated on included building school facilities, establishing village study hours (two hours in the evening when households would turn off televisions and computer game kiosks would be closed), hiring contract teachers, making land available for school infrastructure expansion, resolving conflicts between two schools in a community and encouraging social and religious activities at school. In some cases, collaboration even extended to village council representatives becoming school committees members (Bjork (2009)).

### **III. Sample, timeline and survey content**

This study took place in nine districts in central Java and Yogyakarta, a region chosen because there were few large education projects active in the area, enabling the results to be relatively free from the risk of contamination from other projects. Moreover, conditions were hypothesized to be ripe for community engagement to flourish – the area is peaceful, has reasonably high levels of existing social capital, and schools are relatively well-equipped (high levels of electricity, adequate number of teachers, etc). The evaluation also focuses on public primary rural schools – public because this evaluation was designed by the Ministry, which has the authority over public schools,<sup>12</sup> and rural because the majority of schools in the country are in rural or semi-rural areas, and it was hypothesized that accountability would be easier to engender in smaller, closer-knit areas.

So, from two provinces, nine districts and primary schools, the sampling frame was further restricted by excluding subdistricts containing fewer than eight villages,<sup>13</sup> schools with extremely good or bad average sixth grade examination scores in mathematics or Indonesian,<sup>14</sup> and schools with parallel classes in grade four.<sup>15</sup> We used a two stage sampling procedure, first drawing 44 subdistricts and then 520 schools. Each potential sample school in the pool had an equal probability of being sampled. No more than one school was drawn for each village, to reduce the risk of spill over between interventions.<sup>16</sup> In drawing the school sample, we ensured that the sample was balanced with schools with low, medium and high grade six leaving exam scores across interventions. The resulting sample of 520 schools was randomly allocated to interventions according to Table 1.<sup>17</sup> A disproportionate share of the sample was allocated to the cells receiving nothing or just the block grant, in order to be able to separately identify the effect of the block grant. The training intervention was made slightly smaller than the non-training cells because training is a relatively costly intervention.

The baseline survey took place in January 2007, midline in April 2008, and the endline survey in October 2008, as shown in Table 2.<sup>18</sup> Tests in mathematics and Indonesian, designed by MoNE, were administered

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<sup>12</sup> MoNE supplies some support to private schools, but has direct oversight over public schools.

<sup>13</sup> This restriction was imposed because in the initial design, facilitated meetings with sub-district government education officials were envisioned, and too few villages per meeting would make this intervention ineffective. However, this idea was never implemented, making the restriction unnecessary.

<sup>14</sup> That meant those with the grade six average student scores below four or above eight. School-level score data obtained from MoNE.

<sup>15</sup> Parallel classes are grades with more than one section or teacher. This restriction was imposed because the evaluation was not planning on assigning student IDs or ensuring that the student population was identical over time. With only one class per grade, and low dropout and repetition rates, the evaluation team was confident that the same children interviewed in grade four would be in grade six two years later. However, this actually became an issue, since several schools merged, but the team was able to match student names, see below.

<sup>16</sup> The sampling probability was increased accordingly for schools that were located in villages with more than one school to keep the probability of being sampled equal across schools.

<sup>17</sup> Random allocation conducted by authors.

<sup>18</sup> The survey was conducted by a Moores Roland, a survey firm by MoNE. Five out of 520 schools were not included in the endline survey. Two schools merged, and one school refused interview. In two other schools, the implementer

to all students in grade four (and six at endline).<sup>19</sup> Admittedly, it could take several years for these interventions to translate into learning outcomes, and some individuals involved in project preparation questioned whether the project's success should be judged by learning gains in this short time period. Thus, survey questions center around hypothesized intermediate steps along pathway from school committee actions and enhancements to improved learning outcomes. Broadly, these relate to community support for education, parental support for education, school based management, and teacher motivation and effort. Surveys track parents, teachers, students, school committee members, and principals, including questions such as subjective assessments of learning, and the functioning of the school committee; and community support and process variables that measure the intensity of collaboration between the principal, the school committee and parents. Principals' questionnaires cover financial planning, teacher management, and basic administrative data, such as facilities, and dropout and repetition rates. The teacher sample was restricted to teachers teaching grade four (grade six at endline), along with three randomly selected students from their classes, and these students' parents. Teacher questionnaires relate to behaviour in the classroom, time spent on various teaching tasks, and relationships with school management. Parent questionnaires include parental contributions to school activities, both monetary and non-monetary, and education expenditures; and both students and parents were asked whether and how the children are supported at home with their homework. Specifically to check compliance with the linkage intervention, principal, school committee, teacher and parent questionnaires cover cooperation village council, and overall supervision by local government.

#### **IV. Impact Evaluation Strategy**

In this section we discuss the analytical approach we use to designate the appropriate comparison group given the combinations of interventions, determine test results, handle a lack of compliance with the election intervention, generate results using a large number of outcome variables, and check baseline imbalances across treatment and control groups.

##### *Pairwise impact evaluation*

As discussed above, the objective of this study is to evaluate the effects of four interventions, independently and combined with each other. To estimate this, we analyze seven pairwise comparisons found in Table 4.

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implemented the treatment in schools different than those surveyed in the baseline, so the team felt it unnecessary to survey non-randomly selected schools for which there was no baseline information. In addition, there were some difficulties with non-response in some of the schools, so we have complete information on 508 schools and partial information on seven schools.

<sup>19</sup> In the original sample selection, schools with multiple parallel classes were excluded (so all sample schools started out with one grade 4 class), and thus we did not assign student IDs; but in the endline survey, it was discovered that several schools had more than one grade six class, due to schools merging. We only have data on the number of parallel grade six classes in 240 sample schools, and found that 13 grade six classes had two parallel classes (5 percent). However this issue is remedied by matching student names, see below.

The grant comparison examines the schools in the control group with those that received the grant only, while all other comparisons measure the effect of the other interventions (election, linkage and training) and their combinations, conditional on receiving the grant. Note that the sample size for the three combination comparisons is smaller compared to the others with grant plus only one other intervention, as we exclude the schools that received only election, training or linkage interventions.

We apply weights equal to one over the number of observations in the cell (see Table 1) to ensure that the comparison is balanced across the interventions that are not studied. For instance, when we compare the effect of training, the weighting ensures that the two groups are equally exposed to the linkage and election interventions. Randomized trials in general ensure that in expectation the control and treatment groups are equally exposed to other effects which are not controlled by the experiment. Our strategy ensures that this is also the case for the non-studied interventions in the comparison.

### *Impact on test scores*

The impact of the intervention on test scores is estimated by

$$y_{i,j, \text{endline}} = \alpha + \beta(\text{treatment}_j) + \gamma y_{i,j, \text{baseline}} + \varepsilon_{ij} \quad (1)$$

where  $y_{i,j}$  denotes the standardized test score of student  $i$  in school  $j$ . The standardized test scores are calculated by subtracting the mean and dividing the test score by the standard deviation observed in the control group schools. Note that the baseline value for  $y$  observes the students in grade 4, while by endline these students were in grade 6.<sup>20</sup> The results are calculated using a balanced panel. Standard errors were calculated allowing for correlation between the error terms at the school level. The treatment variable equals 1 for the treatment group, and 0 for the comparison group.

### *Intention-to-treat with the election intervention*

As mentioned above, about half of the schools receiving the election treatment refused to hold an election for all members, so for this intervention we present both the intent to treat (ITT) and the instrumental variable (IV) estimates of the local average treatment effect. For the former, all schools that *received* the election intervention (irrespective of whether it was fully implemented), the treatment variable is set equal to 1. The

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<sup>20</sup> Student test results were matched based on the names of the students written on the test sheets. This resulted in 11,463 tests/students that could be matched, which is equal to 90 percent of the tests administered at baseline, and 92 percent of the tests administered at endline. Only matched data were used in the impact estimations. The students' gender variable was also constructed ex-post using the name of the student.

ITT effect estimate measures the results of the election intervention as it was actually implemented, with some committees only partially elected. For the latter, the IV estimate of impact of the election, we create a new treatment variable: the share of members that are new to the school committee between baseline and endline. This variable indicates the intensity by which the election was implemented, accounting for the possibility of partial elections, and is highly correlated with the initial assignment (see Figure 2). Thus, ITT is the impact of the program as implemented, accounting for the fact that nearly half the schools implemented elections partially; whereas the IV extrapolates findings to estimate the effect as if the full school committee had been elected. The treatment effect is estimated by instrumental variables, where the new treatment variable is instrumented with the initial assignment. Not surprisingly, where we find election effects, the effects are generally larger for the IV versus ITT estimates.

### *Impact on intermediate outcomes*

We not only wanted to understand effects on student learning, but also changes in other variables that were hypothesized to be precursors to learning improvements. Because we collected wide variety of data at the school and household levels (over 100 variables), our challenge was to pare down the analysis to a suite of outcomes that made intuitive sense as pathways to learning, instead of only choosing to report those that showed empirical results. Following Kling, Liebman and Katz (2007) and Banerjee, Banerji, Duflo, Glennerster and Khemani (2010), we construct a summary index (also referred to as a composite) for each domain. We define the summary index score for school  $j$  over the set of  $N_k$  outcome variables in group  $K$  as the mean of the z scores outcome variables in a group.

$$y_{jK} = \frac{1}{N_K} \sum_{k=1}^{N_K} \frac{y_{jK} - \bar{y}_K}{\sigma_{yK}}$$

(2)

Where  $\bar{y}_K$  group  $\sigma_{yK}$  are the mean and standard deviations of variable  $y_{jK}$  estimated from the control group schools. The summary index provides an equal weight to each variable that enters the summary index correcting for natural variation as observed in the control group.

For the intermediate outcome variables and the summary indices we apply a similar estimation method, only we condition on the baseline values of all variables included in the summary index. For instance, for outcome variable  $k$  included in summary index  $K$ , the impact is estimated by

$$y_{j,k, \text{endline}} = \alpha + \beta(\text{treatment}_j) + \sum_{k=1}^{N_K} \gamma_k y_{j,k, \text{baseline}} + \varepsilon_{jk} \quad (3)$$

For estimating the impact on the composite itself,  $y_{j,k,headline}$  is replaced by  $y_{j,K,headline}$ .

Using the technical strategy above, we intuitively group intermediate outcome variables according to the impact domain they refer to. Each impact domain is represented by a table (see Tables 8, and 10-19 below). The list of variables in each domain, their definitions and the source of the data (ie, corresponding questionnaire) is found in Table 5. Each variable is constructed such that it contributes positively to the header or overall concept used for the domain. Often information on the same domain is obtained from different respondents. In order to further guide the discussion (see results section V on intermediate outcomes), we have grouped impact domains into subject themes pertaining to similar intermediate outcomes. This grouping is as follows

1. Results related to education outcomes
  - a. Stakeholder satisfaction with student learning (Table 8)
2. School committee and community support for education
  - a. The number of school committee meetings with education stakeholders (Table 10)
  - b. Stakeholder opinions about school committee effectiveness (Table 11)
  - c. Village councils' collaboration with schools and overall support for education in the village (Table 12)
  - d. Community support for schools and school committees (Table 13)
3. Parents' effort, engagement and support
  - a. Parents' financial and in-kind support to school committees (Table 14)
  - b. Parents' awareness of school committees (Table 15)
  - c. Parents' support for and involvement in education (Table 16)
4. School-based management and accountability
  - a. Number of teachers (Table 17)
  - b. Financial accountability of school management to parents and school committees (Table 18)
  - c. Principals' performance and management of teachers (Table 19)
5. Teacher motivation and effort
  - a. Teacher motivation and effort (Table 20).

#### *Checking baseline, pre-treatment differences*

In order to check whether our baseline outcome values are balanced across intervention groups, we apply a strategy similar to that discussed in the composite section above. In Table 6, we report the estimates of coefficient of  $\beta$  in (1) and (3) where the dependent variable is replaced by the baseline value and only the

treatment variable is included on the right hand side. Naturally for the election, only the intent to treat comparison is shown. To save space, we present the results for the language and mathematics test scores and the summary, composite measures only. No difference can be found for the baseline test comparisons, and the same holds for most summary measures. Focusing on differences with a significance level of 5 percent or below, we find that the treatment groups in the linkage and linkage+election schools have stakeholders with a higher opinion about school committee effectiveness (measure 1), and fewer teachers (measure 7) at baseline.

## V Results

In this section we discuss the impacts on education outcomes, and also on the intermediate outcome variables that were hypothesized to lead to learning. Because all committees that received training, election or linkage also received a grant, results presented are conditional on receiving the grant.

### Education outcomes (Tables 7 and 8)

We begin by measuring the impact of the interventions on the main education outcome variables -- dropout rate, repetition rate, and test scores, which are shown in Table 7. We do not find any significant effects on dropout and repetition rates, which is not surprising given the very low rates at baseline (0.004 and 0.024, respectively). The lack of effects on dropout and repetition rates makes us more confident about comparing test scores of grade 4 and grade 6 students, since if there had been effects, we would have been worried about endogenous attrition causing sample selection bias in our results.

Looking at learning, we find substantial effects in Indonesian, and limited effects in mathematics. Linkage improves Indonesian learning by 0.17 standard deviations, while the linkage+election increases Indonesian test scores by 0.22 standard deviations (ITT/0.38 for IV). One possible explanation for why the intervention affects Indonesian more than math is that, as shown in Figure 2, the math test was quite difficult as evidenced by the higher peak for the endline score. This means that the test was not as good at demonstrating a range of abilities as it was in Indonesian. There is no evidence of ceiling or floor effects for the math scores – in both years the histograms have the expected bell shape curves. The same is true for Indonesian scores at baseline, but the endline histogram has two humps, where the right hump is cut by the maximum score (see **Erreur ! Source du renvoi introuvable.** 2). There is however no clear excess mass at the maximum score, suggesting limited truncation. The two bells found in the curve are in line with the finding that the strongest effects were found for the higher scoring students.

The effects of linkage and linkage+election are larger for children with high baseline scores, specifically the highest two ability quintiles, and for girls. It could be that the higher effect for girls is just picking up the fact

that girls are overrepresented in the higher scoring quintiles at baseline. Whereas the lowest scoring quintile at baseline is made up of 52 percent boys, the highest scoring quintile has only 38 percent boys. In addition to effects in linkage and linkage+election interventions, the quintile analysis also shows effects for the grant intervention, albeit only in the highest ability quintile (0.34 standard deviations). For math, the only significant effect is for the linkage intervention for girls for whom test scores increase by 0.11 standard deviations.

While these improvements in learning are substantial, we do not see improvements corroborated by education stakeholder respondents. Table 8 presents the subjective assessments with students learning of school committee representatives, principals, teachers and parents,<sup>21</sup> who do not demonstrate significant changes in satisfaction with learning for any intervention other than grant (decline in principals' satisfaction by 7 percentage points). Perhaps such subtle changes in learning were not easily observed by school committee representatives, parents or principals. One might expect teachers to notice this most readily, but note that satisfaction levels are generally reported by different teachers, since grade four teachers were interviewed at baseline and grade six at endline, and a grade six teacher might not be aware of the ability that a cohort of students had in grade four.

### *Cost effectiveness*

Using the costs discussed in the implementation section above,<sup>22</sup> we find that the linkage intervention is the most cost effective – the benefit of spending USD 100 on Indonesian test scores measured in terms of standard deviations is 0.13 for the linkage intervention, and 0.07 for the linkage+election intervention. In these calculations, we consider the costs of the specific intervention<sup>23</sup> plus the facilitation costs associated with the intervention. However, we did not include the cost of general facilitation and the grant since the impact results are conditional on receiving a grant. While it is possible that the linkage, election and training interventions became more effective as a result of the general facilitation and grant being available, this hypothesis is not testable as interventions were implemented simultaneously, or at least closely parallel to each other.

### **Intermediate outcomes (Tables 9-20)**

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<sup>21</sup> Since so many parents (nearly 20 percent) responded with don't know when asked to rate their satisfaction with their child's learning, we changed the variable to a dummy regarding whether parents were able to respond to the question. We see no change in this variable for any intervention.

<sup>22</sup> The only cost not mentioned in the implementation section above was overhead costs (team leader, office space, etc) allocated equally to all intervention schools, which amounted to US\$ 140 per school.

<sup>23</sup> We used the intent to treat results for the election benefits. The costs, which covered facilitator visits, would likely have been higher had a full election of the school committee been enforced, necessitating perhaps further visits to the school.

In the following sections, we discuss how intermediate variables individually and comprised of impact domains or composites were affected by the various interventions. Recall that each impact domain is represented in one of the tables 8 and 10-20 below, which also include results for each individual variable making up the composite. Below we discuss results relating to the composites overall as well as their individual variables, mainly relying on the individual variable explanations when we see no effects at the composite level.

As a preview of the results, we tabulate the fraction of coefficients that showed a significant effect by respondent group, shown in Table 9. This table simply counts the number of significant coefficients in order to illustrate in what areas we are seeing greatest changes. We include the largest number of variables regarding the school committee, but surprisingly, find the smallest number of significant effects. Examining findings by intervention, we find that the grant showed the greatest number of effects with the variables obtained from parents and school principals, the elections with teachers, and the linkage with school principals. The training intervention showed the least significant effects, which are consistent with the lack of impact found on learning outcomes.

#### *School committee and community support for education (Tables 10-13)*

Here we examine whether any of the interventions has an effect on school committee activities, engagement with the community and perceptions of effectiveness, by the principal, teachers and school committee representatives.<sup>24</sup> First we look at whether the school committee improves interaction and outreach, specifically meetings internally and with any other stakeholders (principals, parents, district or sub-district education offices, village council, teachers), shown in Table 10. On average, school committee meetings with most stakeholders increase, corroborating analysis from midterm data that the grant funds were primarily used for meetings.<sup>25</sup> However, in terms of significant increases, only the grant intervention has a strong overall effect on the meetings composite, with individual effects demonstrated for internal school committee meetings (increase by 0.95 meetings) and school committee meetings with the local education office (increase by 0.32 meetings). Interestingly, with the linkage interventions, meetings initiated by the

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<sup>24</sup> We were not able to use the variable on parents perceptions of school committee effectiveness due to high numbers of don't know responses. We added the percent of parents being able to answer this question to the composite parents' awareness of school committee, but saw no change from any intervention.

<sup>25</sup> The midterm data indicate that on average 43 percent of the budget is used for meetings, 13 percent was used for school extracurricular activities, and four percent on school buildings. Less than two percent is spent on purchasing learning materials, tests, teacher training or 'incentives' (small amounts of money given to school committees or teachers). Twenty-eight percent was spent on a non-coded "other" category. Respondents answering this category were asked to specify the spending category. About one third of the time, administrative purposes are mentioned, another one third of the times, 'school events' were mentioned. The remaining categories were: activities relating to student learning (13 percent), infrastructure investments (11 percent), training (nine percent), and financial aid to students (three percent).

local education office actually declined significantly, suggesting that the local education office may have pulled back as a result of greater school engagement with a more decentralized administrative body.

While grant and somewhat less so linkage help explain school committee interactions, election interventions seem to improve perceptions of school committee effectiveness, especially by teachers, suggesting that the democratic election improved legitimacy (Table 11). The overall school committee effectiveness composite is significantly positive for election, linkage+election and training+election, as it is for teachers perceptions of school committee effectiveness. Linkage and training in combination with election make the effect stronger than the effect of just election alone. However, while perceptions by teachers improve, they are not echoed by principals and school committee representatives. Principals don't report any expansion of school committee activities, and school committee representatives are no more likely to say that the school committee helped meet school's needs over the last semester.

As shown in Table 12, all linkage-related interventions enhance collaboration between the school committee and the village council, as was hoped with the treatment. Elections and training in addition to linkage strengthen the effects. The table also presents the observations of principals and school committee members about the village council support for school activities, and we see principals' satisfaction increase significantly, but there is no change in school committee representatives' satisfaction. This suggests that while principals feel that support from the village council is changing, school committee representatives think there is perhaps room for improvement.

While school committee representatives don't feel that support for schools is changing with the linkage intervention, parents and principals seem to agree with principals. Table 13 shows that parents' satisfaction with community support for schools also improves with the linkage intervention, and according to data from principals, training has a positive effect on collaboration with non-educational community organizations other than the village council. In combination, linkage+training has a significant positive effect on the composite. The first four rows in Table 13, however, again suggest that the school committee does not perceive changes in community support in areas such as in-kind or financial contributions.

#### *Parents' effort, engagement and support (Tables 14-16)*

Here we look at how interventions affected variables related to parental awareness of the school committee, and parents' engagement in their children's education.

The most interesting and significant finding related to parental effort, as shown in Table 16, is the total number of minutes that any household member accompanies a child studying at home in the past week (so this was asked of fathers, mothers and anyone else in the household). With the election intervention, the

minutes accompanying children per week increased by 78 minutes (ITT, 147 minutes for IV).<sup>26</sup> Statistically weak yet positive effects on homework support are found for the training+election intervention and on the composite for the election+linkage intervention. However, parental engagement seems to be largely limited to supporting homework. There is no change in stakeholder (parents themselves, school committee, teachers or principals) satisfaction with parents' support for pupils' education, nor do we see any change in the number of times parents come to school to meet a teacher or observe class. (Actually, with the training intervention, the number of times parents come to school to observe class goes down.) There are two possibilities for these changes. First, parents could have participated in the election process, raising their awareness about the importance of education generally. Second, democratically-elected members may be doing more community outreach, affecting parental effort at home, yet not affecting generally or how parents engage with the school committee, principals or teachers.

The first order effect of the grant intervention is that it increases parents' knowledge of the school committee by 13 percentage points (see Table 15), and also improves parents' ability to name members of the school committee. One possible explanation of this effect is that knowledge of the school committee is a result of more parents attending school committee meetings. The grant has an effect in the number of internal school committee meetings, but internal meetings don't include those with parents. And we see no change in number of formal meetings between the school committee and parents. However, even if the number of meetings doesn't change, meetings could be attracting more parents. Interestingly, while some awareness of the school committee improved, as shown in Table 15, we see no change in the proportion of parents being able to answer a suite of questions about the school committee (such as whether the school committee fights for parents interests or seeks input from parents and the school, and whether the committee chair can influence principals decision-making on school policies), suggesting that while basic awareness improved, this does not extend to knowing what the school committee does or believing that it advocates for parents' needs. Also, although awareness improves, as shown in Table 14, school committee representatives also indicate no effect of any of the interventions on parents' in-kind or financial support for school committees, consistent with no change in community support in this area (see Table 13).

#### *School-based management and accountability (Tables 17-19)*

Here we look at how interventions affected variables related to school based management: teacher employment, teacher motivation and effort, and principals' effort and teacher management.

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<sup>26</sup> The survey asked household members to report the number of hours per day and the number of days a week that they accompanied his/her child studying. Field workers were then instructed to convert hours per day to minutes, so there was the potential for rounding errors, and we see this with peaks in the data on the hour (e.g., 60, 120, 180 minutes).

One possible avenue to improved learning could be hiring more or different kinds of teachers, such as contract teachers<sup>27</sup> Hiring local teachers could also have been a use of grant money. We find no significant change in the number of any type of teachers for any intervention (see Table 17), perhaps due to the likely already sufficient number of teachers in the schools (on average nine civil servants and contract teachers at baseline) and against the backdrop of a country with an oversupply of teachers (World Bank, 2010).

Another hypothesized avenue to improved learning was that the support for the school committee would result in more accountability for routine financial decisions of the school. The variables included in the composite or summary index on financial accountability ask about parents' and school committees' involvement in the school budget (RAPBS). The grant has an effect on the overall accountability of principals to parents and the school committee (composite as a whole is significant, see Table 18). Principals report to provide more information to parents about school funding and budgeting (significant for the grant and linkage interventions); although this is not confirmed by parental reports. We see no change in any other accountability measures, such as involvement of the school committee in developing the school budget, school committee receiving the school budget, or principals involving the school committee and community in developing the school budget.

It is in the area of teacher management that we find conflicting reports from teachers and principals, see Table 19. According to data obtained from teachers, the linkage intervention reduces the amount of rewards and sanctions provided by the principal (linkage+election also reduces sanctions), while elections and linkage+elections mostly result in more routine meetings between principals and teachers. Teachers' overall assessment of principals improve by four percentage points for linkage+training. According to data obtained from principals, it is the linkage intervention that increases meetings with teachers (although not significant) and, linkage, particularly in combination with training, prompts principals to be more likely to reward teachers who perform well (through recognition, gifts or money). One area in which teachers and principals concur is that we find no effects for the number of teacher evaluations conducted by principals across all interventions. It should be noted that these are views regarding a hierarchical management relationship, which may seem very different from different perspectives. The findings, although not strongly conclusive, are in line with the election intervention having more of an effect on teachers while the linkage had more of an effect on principals as shown in Table 9.

*Teacher motivation and effort (Table 20)*

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<sup>27</sup> Of course, the school could have dismissed teachers and hired new ones. We only know that the absolute number of teachers did not change significantly.

In this section we examine perceptions of quality and performance of teachers (by the principal, school committee, parents and teachers themselves), effort demonstrated by teachers (measured by hours spent on teaching activities) and direct classroom observation of teaching (if there were students in the classroom, was there also a teacher).<sup>28</sup> The results are presented in Table 20. We see no effect on respondents' perceptions of teacher effort. However, we see movement on the two more objective variables -- observing teachers in the classroom, which is significant with election alone and training+election interventions (yet this is not a positive result, see below); and teachers putting in more hours per day, which is significant with the election alone and linkage+election interventions. To measure teaching hours, we look at self-reported hours per day that teachers spent on lesson preparation and grading (in school and out of school), and teaching and supervising class activities (in school only).<sup>29</sup> These hours do not include training, administrative work or giving assignments without overseeing students doing them. With the election intervention alone, teaching hours per day increases by 0.63 hours (ITT; 1.2 hours IV), and by 1.1 hours (ITT; 2 hours IV) for the linkage+election intervention. This suggests that teachers respond to the linkage and election interventions with increased effort, especially election (perhaps community representation improved legitimacy), and linkage+election (oversight and support from a local administrative body may further increase legitimacy, and bring attention to the importance of education). It's possible that the election and linkage+election interventions also provide teachers with more influence and voice, since traditionally school committee representatives were appointed by principals. These interventions clearly shift the power of principals, and increase the profile of education in the village, which may contribute to teachers' job satisfaction and overall community respect for teaching.

While teaching hours increases with election and linkage+election interventions, a puzzling result is that the proportion of teachers present in the classroom (when there were children in the classroom) *decreases* with election (by 5 percentage points ITT, 9 percentage points IV) and training+election interventions (by 7 percent point ITT, 12 IV). So while elections may prompt teachers to increase working hours, there is a significant decrease in the fraction of teachers in the classroom. Particularly for elections, and to a lesser extent for training +elections, these results seem to contradict each other. For this reason we also analyse the impact on each of sub-components of the hours worked variable (not shown in a table). The results indicate that for election it is the lesson preparation time that went up and for training+elections the time grading. These are both non-teaching activities, making it less surprising that positive negative effect was found for the fraction of classes observed with a teacher present. For the linkage+election intervention, where there is no contradiction, teaching and grading hours go up, confirming that the intervention has an effect on the time teachers teach children in class.

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<sup>28</sup> For this variable, we divide the number of classrooms with teachers by the number of classrooms that fieldworkers observed with students in them.

<sup>29</sup> The question asked of teachers was hours per week in the past week they engaged in a particular teaching activity, and this was divided by number of days per week that the teacher worked in the past week.

## **VI. Comparison with qualitative study**

In addition to variables described above and analysed as part of our quantitative work, we also collected in-depth information through focus groups and community interviews about how school committees and communities were responding to the interventions, in a sub-sample of six, purposively-selected schools. Field teams spent about a week with school committees and other education stakeholders in July 2008, just several months before the endline survey. Results in detail are presented in Bjork (2009 ); in this section we summarize the main conclusions, and compare findings with those from the quantitative research.

The primary focus of the qualitative work was to look at a combination of interventions and their synergies, so the research team selected schools exposed to the linkage+training, linkage+election, training+election treatments. For each combination, the project implementer was asked to select a school where the school committee appeared to be functioning well, and another where it was operating with difficulty. The qualitative and quantitative research were driven by similar evaluation questions, but the qualitative research concentrated on the influence that school committees exerted on school-based management variables, such as parental participation, decision-making, and the quality of services provided in the schools, rather than learning. .

The qualitative research underscores school committees' appreciation for receiving funding that was directly under its control. Respondents indicated that the grant was the impetus for more face-to-face dialogue among members, which is in line with midline quantitative findings, that the grant is mostly used for meetings. While the grant fostered dialogue, it also caused conflict between the school committee and principal in some cases. The fact that the principal and school claimed authority over the grant indicates that the grant was successful in serving as a counterbalance to principal influence. One other change we see from the quantitative analysis is improvement in parent awareness of school committee existence or its members, yet the qualitative analysis shows no indication of this change.

Challenges in implementing elections, specifically that existing school committees and school management sometimes resisted membership changes, are also seen in the qualitative work, which cites one example where the election was staged and controlled by the existing school committee and school management. Not surprisingly, in the school with the staged election, respondents reported no benefits. However, where the election was conducted as designed, elections served to enhance community's awareness about the school committee, attract a broader spectrum of the community to serve on the school committee, and play a role in developing school committee legitimacy. This new legitimacy is also confirmed by teachers in the quantitative analysis, which shows that teachers' opinions about school committee effectiveness improve (for election alone and combined with training). In the quantitative analysis, parents report improved

satisfaction with support from the community with elections, which is consistent with qualitative findings that the advent of elections causes committee members to report that the committee represents community needs rather than those of the school administration.

Overall, consistent across qualitative and quantitative findings, we see little improvements as a result of training or training-related interventions. Trainees reported that they appreciated the opportunity to interact with fellow school committees and visit a model school committee, but they felt that the training materials lacked relevance and practical application. In the quantitative research we find that training improves school's cooperation with non-educational community organizations (as reported by the principal), so indeed the training may have improved knowledge-sharing and facilitated greater outreach. There is some indication that elected school committees benefit more from the training, as they were more motivated to come up with new actions, and this is at least substantiated by teacher perceptions, as their opinion of school committee effectiveness improves with training+election.

Compatible with quantitative findings, the qualitative research shows little positive effects of the linkage intervention on school-based management variables, or on government financial or material support for the school or committee, another objective of the intervention. The qualitative study finds the most common observable effects of linkage are village council members being elected or appointed to serve on the school committee; and that linkage serves existing power structures. The partnership between the school committee and village council often results in concrete actions, such as enforcing study hours in the village, which didn't necessarily involve actions by the school committee. The quantitative research confirms the lack of impact of this intervention on school governance variables (such as changes in principal behavior or accountability), and that the intervention has no effect on opinions of school committee effectiveness or awareness of the school committee. The quantitative research however shows by far the biggest impacts with the linkage interventions, with particular response from teachers (with linkage+election), and learning, which was outside of the scope of the qualitative research. Although this intervention was designed to enhance the role of the school committee, quantitative and qualitative analysis are consistent that it does not achieve this. Instead of working through the school committee, the linkage intervention led to actions that bypassed the school committee, yet it was nevertheless effective. This could explain why quantitative measures, which focused on school-based management, failed to pick up an apparent pathway for this effect.

## **VII. Discussion and Conclusion**

Here we discuss some of the pathways from the intervention to improvements in test scores, what intermediate variables changed as a result of the interventions, how these results compare with those internationally, and provide an update on some recent applications of this research.

*Pathways to improved learning: why did learning improve for linkage and linkage+election interventions?*

Since we find significant effects in learning only with the linkage and linkage+election interventions, here we discuss what factors may have led to these improvements. As mentioned above, we see linkage alone resulting in 0.17 standard deviation change in test scores for Indonesian, and linkage+election improving Indonesian test scores by 0.22 standard deviations (ITT/0.38 for IV).

While the linkage evaluation shows impressive results in learning and cost benefit, we don't find strong evidence that school-based management was an intermediate step between the intervention and improved test scores. Not surprisingly, the most obvious impact of the linkage-related interventions was school committee representatives and school principals reporting greater collaboration between the school and the village council. This collaboration was generally in the form of financial or in-kind assistance, other miscellaneous assistance such as services or administration, procurement, or manpower. While we have evidence that some kind of cooperation between the school committee and village council happened (see Table 12), this does not seem to have resulted in enhanced stature or empowerment of the school committee as a whole. Neither principals nor teachers show a change in their assessment of school committee effectiveness, and even school committee representatives themselves report no change in their opinions about whether the school committee helped meet school needs. While parents report increased satisfaction with support from the community for schools (which may not mean school committee), they don't show any change in knowing that the school committee exists or knowing its members; and parents are not in any way more involved in their child's education. One other pathways explanation, drawing from the qualitative work, is that linkage generated interest by elites in the community who promoted concrete actions, such as enforcing study hours in the village, but this didn't necessarily involve the school committee. Thus, linkage has an effect from bypassing the school committee, rather than working through it.

Turning to what is happening at the school level, linkage shows some significant, albeit contradictory, effects on teacher management and transparency. Principals report to provide more rewards, but this is denied by teachers, who indicate that the principal provides less rewards and less sanctions. Principals report to be more likely to tell parents about school funding and budgeting, but parents don't report any change in budget meetings or being told about school budgeting. If principals are correct, the effects on learning may have come from their providing better incentives to teachers and better informing parents.

The pathways to learning with the linkage+election intervention are clearer -- through actions of the school committee and teachers. As with linkage alone, we see parents demonstrating increased satisfaction with support from the community for the school. A higher share of parents also at least know the school committee exists (from about 50% at baseline, improved by 7 percentage points ITT/15 percentage points IV), although parents are not more likely to be able to name members of the school committee (improvement

significant only at the 10% level). But overall awareness of the school committee is clearly improving at the household level.

At school, for linkage+election, the composite relating to opinions about school committee effectiveness (as perceived by the principal, school committee and teachers) shows improvement (21 percentage points ITT/38 percentage points IV), with particular improvement around teacher perceptions of effectiveness. Teacher effort also improves, with teachers spending on average 0.6 to 1 (ITT/1.2 to 2 for IV) hours more per day on lesson preparation, classroom teaching and grading, inside and outside of the classroom. Teachers report an increase in meetings between teachers and principals over the past year, although this is not substantiated by principals. Thus, teachers' effort leads to an increase in learning; and perhaps effort improves because teachers are more supported and encouraged by a school committee that holds greater legitimacy (because its members were elected by the community rather than appointed by the principal), and because it has links with a prominent, local governing body.

*Precursors to improvements in learning: effects on intermediate variables*

Looking at what intermediate variables were affected by the interventions, we see the most significant effects on variables that were not directly related to the school committee activities or functioning. We don't find changes in community or parental (in-kind or financial) support for the school committee, other than parents' satisfaction with community support for the school committee changing with the linkage interventions, and teachers' perceptions of school committee effectiveness improving with the election and linkage+training and training+election interventions. Nor do we find principals involving school committees in budgeting or at least informing school committees about the school budget. School committee internal meetings increase with the grant, but not between the school committee and other parties.

We find the most significant improvements in concrete areas related to parents and teachers. Parents improve average minutes accompanying children with studying per week with the election intervention (on average 78 minutes more per week, ITT), and we see modest improvement in parents simply knowing that the school committee exists with the grant (13 percentage points) and linkage+election interventions (15 percentage points, IV. ITT also improves but it is only significant at the 10% level). But this is as far as parental engagement goes – parents don't come to school or meet teachers more often, and are not more knowledgeable about what the school committee does. This means that while it was expected that the school committee interventions were actually designed to improve parental engagement with the school and school committee, parents actually only took action at home.

We also see tangible effects on teacher effort with teaching hours going up by 0.6 to 1 hours per day for election and linkage+election, respectively (ITT); yet we observe 5-9 percentage point difference in the

number of teachers present in the classroom for election and training+election interventions (ITT). We cannot offer an explanation for a decline in teacher presence; but we know that the increased teacher effort was not in the classroom, rather on activities such as grading.

### *Comparing results to other research*

Placing the Indonesia results in context with other studies that attempt to improve community participation with the view of improving school quality, we find some parallels and departures. In this experiment, results for the training and grant interventions are most similar to those from Blimpo and Evans (2010), showing no impact on learning, and some modest improvement in variables related to school committee activities. In contrast, Khattri et. al (2010) and Gertler et. al (2010) show changes in learning; and Gertler et. al (2008) and Blimpo and Evans (2010) see changes in repetition and failure, and enrollment rates, respectively – none of which change for our evaluation. Thus, in the Indonesia case, interventions to internally strengthen the school committee do not improve education quality.

We find no interventions similar to the linkage and election interventions, but we find some parallels in the literature related to promoting accountability in service delivery. Banerjee et. al (2010) tests interventions that were hoped to energize a village education council (VEC) that includes the head of the village council, but this experiment did not specifically target building relationships between village government and the school committee. In fact, it hoped to embolden community engagement as a counterbalance to village government's strong influence on the VEC. This counterbalance did not materialize as a result of information sessions about the role of the VEC and its responsibilities.

Instead, Banerjee et. al (2010), along with Nyuyen and Lassibille (2008), show improved community engagement leading to learning, in spite of rather than due to local administrators. In Indonesia, in the case of the linkage intervention, we find that a local representative body supports learning by eliciting community action, such as enforcing study hours in the village, although this isn't through the school committee as intended. Knowledge and awareness of the school committee doesn't change, nor do school committee activities, or opinions of school committee effectiveness. However, linkage results in improved learning,, suggesting that the effect is from bypassing the school committee, rather than working through it.

It is only when linkage is combination elections, the intervention most focused on increasing community-wide engagement in education, that we see some realization of hypothesized pathways from school-based management to learning, as described in Barrera et. al 2009. Elections promote inclusivity, and the school committee is energized to affect school-level goals, such as teacher effort. Conditional on receiving the grant, elections motivate parents to spend more time accompanying children with homework and teachers to spend more time doing teaching-related activities. Without the linkage intervention however, elections do

not translate in to improved learning outcomes. Instead, a democratically chosen school committee, combined with a school that cooperates with influential leadership in the village, improves learning.

The results of the linkage and election interventions suggest that reaching out to education stakeholders outside the school committee – through a democratic election process or by collaborating with the village council are the most promising paths to improved learning. Bolstering internal school committee operations have only marginal impact, while outreach measures lead to greater community and school-level engagement, and subsequent improvements in learning.

The results from the linkage intervention also contribute to a body of evidence about community engagement being successful when community-level stakeholders are assigned a specific task or agenda, and when information or training is targeted. Nyuyen and Lassibille (2008), Björkman and Svensson (2009), and Banerjee et. al (2010) show examples of community groups responsible for following up on an action plan for school improvement, monitoring compliance with an action plan for health service improvement, monitoring contract teacher performance, or teaching children to read. The collaborative task in the linkage intervention was to, among the school committee and village council, decide how the block grant should be utilized. This task motivates community support, as in other countries.

#### *Eratum*

While we can't draw a causal link between the study findings and influence over national policy, a positive development so far is that a recent Ministry implementation document states that school committees should be democratically elected, using the exact election process piloted during this study (Departemen Pendidikan Nasional (2009)). The document recognizes that in practice school committees are still chosen undemocratically and suggests that the process used for this experiment may encourage broader representation and voice.

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Figure 1: Pathways from intervention to learning

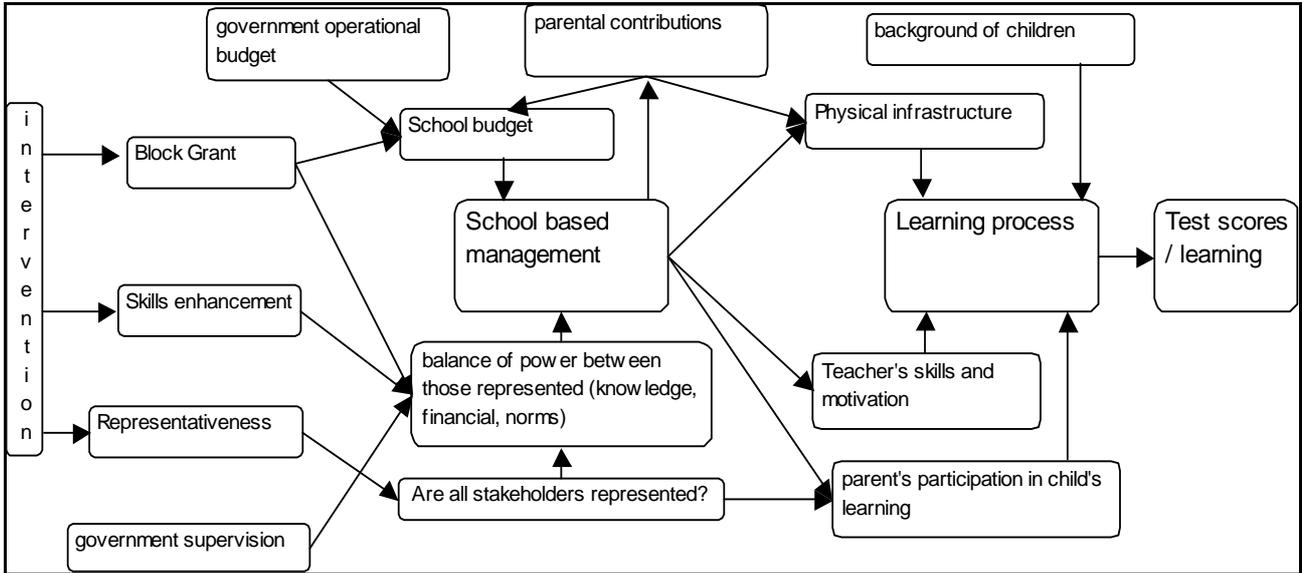
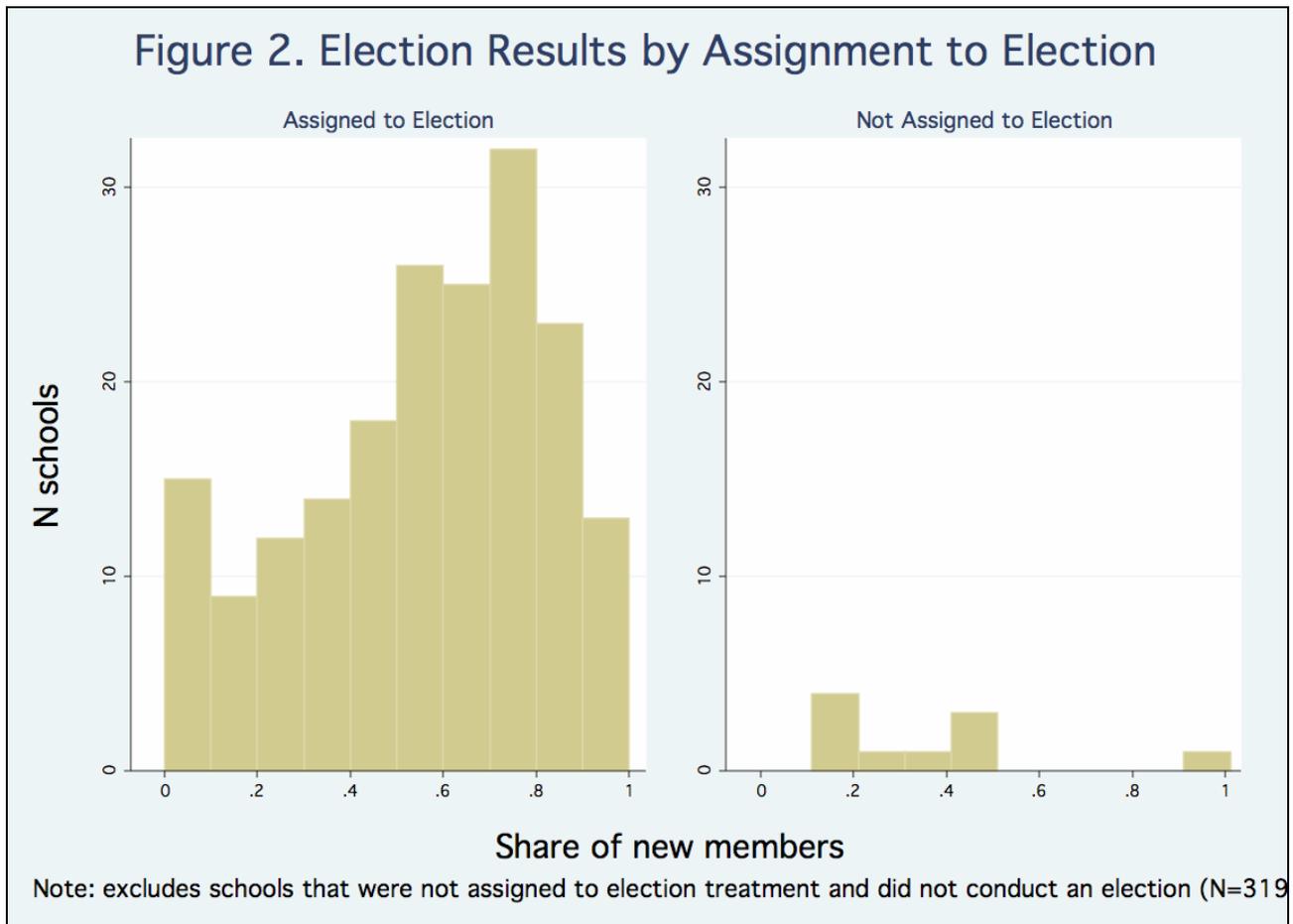
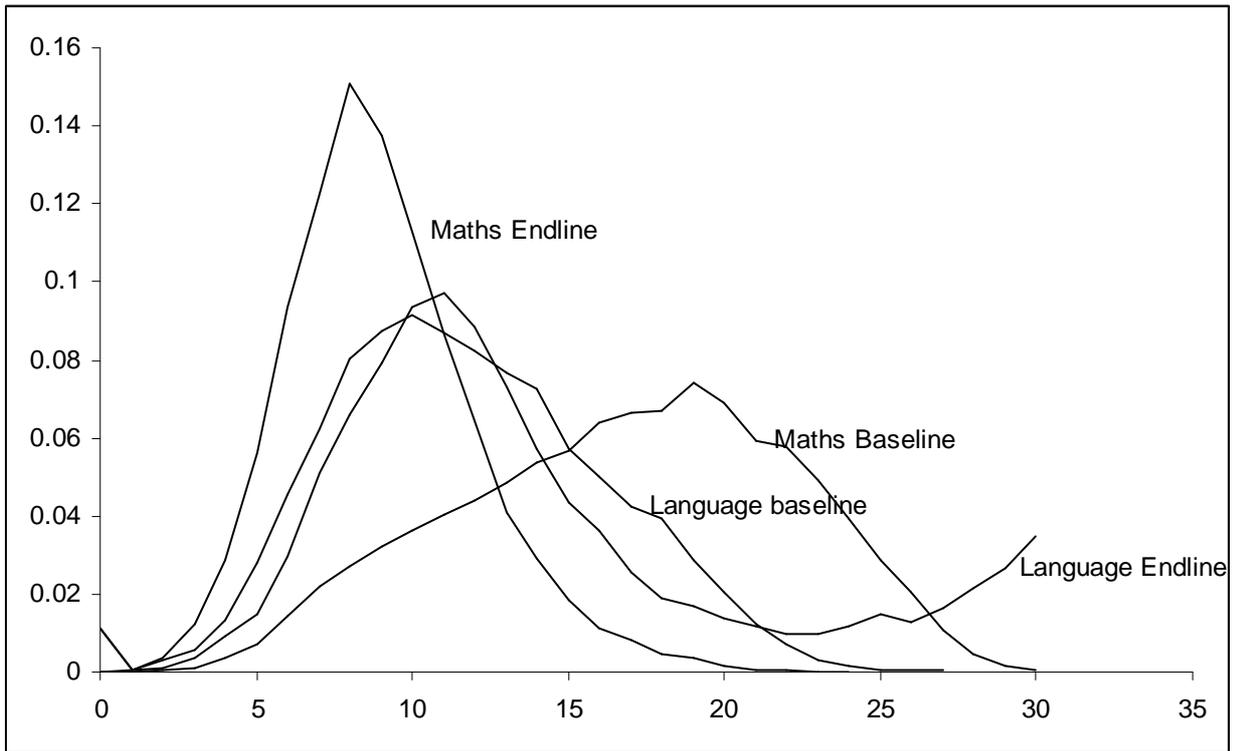


Figure 2. Election Results by Assignment to Election



**Figure 2: Probability density functions of test scores**



**Table 1: Allocation of schools to treatments (number of schools)**

Receiving block grant	No election		Election		Total
	Linkage	No Linkage	Linkage	No Linkage	
No Training	50	90	50	50	240
Training	45	45	45	45	180
Total	95	135	95	95	420

Control Group, not receiving block grant, no intervention: 100 schools

**Table 2: Study timeline**

Activity	Period
Baseline survey	January to February 2007
Training of school committees	July to September 2007
Linkage	June to October 2007
Elections	April to August 2007
Disbursement first block grant	February 2008
Midline survey	April 2008
Qualitative study	July 2008
Endline survey	From October to November 2008
Disbursement second block grant	December 2008

**Table 3: Adherence to design (% of intent to treat)**

	Fully Implemented (1)	Partially Implemented (2)	Not Implemented (3)
Election	47.9	44.7	7.4
Grant	98.8	0.0	1.2
Training	100.0	0.0	0.0
Linkage	98.4	0.0	1.6

**Table 4: Impact evaluation framework**

Comparison	Treatment	Number of schools assigned to the group	Control	Number of schools assigned to the group
Grant	Grant-only	90	No grant	100
election	Grant + Election	190	Grant + No Election	230
Linkage	Grant + Linkage	190	Grant + No Linkage	230
training	Grant + Training	180	Grant + No Training	240
Linkage + Elect	Grant + Linkage + Election	95	Grant + No Linkage + No Election	135
Linkage + Training	Grant + Linkage + Training	90	Grant + No Linkage + No Training	140
Training + Elect	Grant + Training + Election	90	Grant + No Training + No Election	140

**Table 5: Intermediate variable definitions<sup>30</sup>**

Letters before the variable name indicate type of questionnaire from which variable was drawn. SC = school committee. P = parents. T = teachers. SP = school principal. S = student. OB = school-level observational questionnaire.

Composites and component variables	Variable description
Table 8: Stakeholder satisfaction with learning	
SCsatlearn	School committee representatives' satisfaction with student test scores in 2007/08
Psatlearnknow	Whether parents were able to answer a question about their satisfaction with student test scores in 2007/08
Tsatlearn	Teachers' satisfaction with student test scores in 2007/08
SPsatlearn	Principals' satisfaction with student test scores in 2007/08
Table 10: School committee meetings with education stakeholders	
SCmeettripartite	Number of formal meetings with school committee, principal, parents
SCmeetprincipaltot	Number of informal and formal meetings with school committee, principal to discuss school issues/problems
SCintmeettot	Number of internal formal and informal school committee meetings without principal or parents
SCmeetparents	Number of formal meetings with school committee and parents, but principal not invited
SCmeetdinas	Number of formal meetings between school committee and Dinas kab/kota/keca (invited by Dinas)
SCmeetcomm	Whether school committee has ever had a meeting with any set of community groups
SCmeetbpd	Whether school committee has ever had a meeting with village council
SPmeetsc	Number of informal meetings with principal and school committee representative + number of formal meetings with principal and school committee members + number of formal meetings with entire school committee
Tscmeet	School committee invited teachers to discuss issues and problems at the school
Table 11: Stakeholder opinions about school committee effectiveness	
SPsceffective	School committees' cooperation, support, outreach and involvement in the school and community, according to principals
SCposcontr	Whether school committee helped meet school's needs during the first semester of school year 2007/08
Tseperception	Teachers' evaluation of school committee effectiveness
Table 12: Village council's collaboration with schools and overall support for education in the village	
SCbpd	Whether the school worked with the village council in the school year 2007/08
SCsatbpd	School committee representatives' satisfaction with village council's support for education in the village
SPbpd	Whether the school worked together with the village council in school year 2007/08
SPsatbpd	Principals' assessment of extent of village council's support for education in village (conditional on principal knowing there is a village council in the village)
Table 13: Community support for schools and school committees	
SCsatcomm	School committee representatives' satisfaction with support from community
SCnonbpd	Whether school committee cooperated with any non-educational community organizations other than the village council in the school year 2007/08
SCcomfundraise	Community, private sector and other contributions in the first semester of school year 2007/08 (Rupiah in millions)
SCcominkind	Whether community, private sector or any other private person/organization provided in-kind donations in the first semester of school year 2007/08
SPsatcomm	Principal's satisfaction with support from community
SPnonbpd	Whether school cooperated with any non-educational community organizations other than the village council in the school year 2007/08
Psatcomm	Parents' satisfaction with support from community
Tsatcomm	Teachers' satisfaction with support from community
Table 14: Parents financial and in-kind support for school committees	
SCparfundraise	Parental contributions in the first semester of school year 2007/08 (Rupiah in millions)

<sup>30</sup> Variables from Table 8 are considered outcome-level variables but are included here as they make up a composite.

SCparinkind	Whether parents provided in-kind donations in the first semester of school year 2007/08
SCsizeinkind	School committees' subjective assessment of in kind contributions of parents to school committee in past semester
Pcont	Amount of voluntary financial and in-kind donations from parents to school committee in past year (Rupiah /thousands)
Pcont_physical	Whether parents contributed in-kind to school committee in past year
Table 15: Parents' awareness of school committees	
Pknow_scexist	Parents know there is a school committee
Pknow_scmem	Parents know names of school committee members
Pscanswer	Parents are able to answer series of questions about school and learning
Table 16: Parents' support for and involvement in education	
Pmeet_teacher	Number of times parents met with teacher in the last three months to discuss child's performance (other than to pick up report card)
Pvisit	Whether parents have ever come to school to observe class
Pallhh_min	Total number of minutes all household members accompanied child studying at home in past week
Psatparents	Parents' satisfaction with parents' involvement in school and learning
Pchildatt	Emphasis parents put on child's education (compilation of five opinion questions)
SCsat parents	School committee representatives' satisfaction with parents' support for pupils' education
SPsatpar	Principals' satisfaction with parents' support for pupils' education
SPparents involve	Principals' assessment of parents' involvement in school and learning
Tsatpar	Teachers' satisfaction with parents' support for pupils' education
Tparents perception	Whether teachers think parents of her/his pupils can help students improve achievement
Tparents perception1	Teachers' perception about parents' involvement (actual and desired)
Shome support	Someone in the household promotes, accompanies and answers questions relating to home study
Table 17: Number of teachers	
PNSteach	Number of civil servant teachers
GTTteach_govt	Number of contract teachers hired by government
GTTteach_school	Number of contract teachers hired by school directly
Table 18: Financial accountability of school management to parents and school committees	
SCrapbs	Involvement of school committee in developing school budget (according to school committee)
SCreapbs	Whether school committee received the school budget in school year 2007/08
SCdistrapbs	Whether materials about school funding and budgeting were distributed to parents in school year 2007/08
SPinviterapbs	Involvement of school committee and community in developing school budget, according to principal
SPparentsrapbs	Whether parents were told about school funding and budgeting in the school year 2007/08
Pmtgrapbs	Whether there was a meeting at the school about the budget
Prapbs	Whether parents were told about school funding and budgeting in the school year 2007/08
Table 19: Principals' performance and management of teachers	
SPmeeteach	Number of meetings between principal and teachers during school year 2007/08
Tprinmeet	Number of routine meetings between principal and teachers in past year
SPteacheval	Whether principal conducts oral or written evaluations of teacher performance beyond compulsory yearly evaluation and whether results are given to teacher verbally or in writing
Tprinceval	Whether principal conducts evaluations of teacher performance beyond compulsory yearly evaluation to teachers
Tprincipal	Teachers' overall assessment of principal (principal rated on seven areas of performance)
SPteachaward	Whether principal rewards teachers who perform well (through recognition or gift/money), according to principals
SPteachaccount	Whether principal sanctions teachers who don't perform well (through warnings or training), according to principals
Treward	Whether principal rewards teachers who perform well (through recognition or gift/money), according to teachers
Taccount	Whether principal sanctions teachers who don't perform well (through warnings or training), according to teachers
SCprinceffort	School committee representatives' perception of whether principal has taken measures to address issues that are holding back learning

Table 20: Teacher motivation and effort	
SCsatteachers	School committee representatives' satisfaction with quality and performance of teachers
SCteachnoproblem	School committee representatives' perception of whether teacher quality has been a problem
SPsatteach	Principals' satisfaction with quality and performance of teachers
Tsatteach	Teachers' satisfaction with quality and performance of teachers
Psatteachers	Parents' satisfaction with quality and performance of teachers
Pteacherperception	Parents' perceptions of teacher effort and approachability
Hours	Number of hours worked <i>per day</i> in past week on teaching activities
Tmeetparents	Number of times in past three months that teacher met with parents to discuss student learning
OBfractwithteach	Fraction of classrooms with teachers (of those classrooms with teachers)

**Table 6: Tests of pre-treatment balance in observables across interventions**

	Grant	Election	Linkage	Training	Linkage+ Elect	Linkage + Training	Training+ Elect
Language	0.134 (0.094)	-0.051 (0.065)	0.001 (0.065)	-0.058 (0.065)	-0.051 (0.090)	-0.057 (0.092)	-0.109 (0.087)
Mathematics	0.105 (0.101)	-0.061 (0.069)	0.015 (0.069)	-0.002 (0.069)	-0.047 (0.103)	0.013 (0.101)	-0.063 (0.092)
Table 8: Stakeholder satisfaction with student learning	-0.066 (0.082)	-0.073 (0.058)	0.057 (0.058)	-0.051 (0.058)	-0.016 (0.077)	0.005 (0.083)	-0.124 (0.075)
Table 10: The number of school committee meetings with education stakeholders	-0.035 (0.074)	0.031 (0.051)	-0.002 (0.051)	-0.025 (0.051)	0.028 (0.074)	-0.027 (0.071)	0.006 (0.066)
Table 11: Stakeholder opinions about school committee effectiveness	-0.176* (0.091)	0.038 (0.058)	0.164*** (0.058)	-0.079 (0.058)	0.202** (0.083)	0.086 (0.082)	-0.041 (0.080)
Table 12: Village councils' collaboration with schools and overall support for education in the village	-0.094 (0.097)	0.016 (0.071)	0.069 (0.071)	-0.077 (0.071)	0.085 (0.097)	-0.008 (0.095)	-0.061 (0.098)
Table 13: Community support for schools and school committees	-0.06 (0.069)	-0.02 (0.051)	-0.013 (0.051)	-0.083 (0.051)	-0.033 (0.066)	-0.096 (0.074)	-0.103* (0.063)
Table 14: Parents' financial and in-kind support to school committees	0.025 (0.085)	-0.039 (0.071)	0.058 (0.070)	0.074 (0.070)	0.02 (0.119)	0.132 (0.095)	0.035 (0.094)
Table 15: Parents' awareness of school committees	0.032 (0.125)	0.012 (0.081)	-0.099 (0.080)	-0.047 (0.081)	-0.086 (0.114)	-0.145 (0.108)	-0.035 (0.111)
Table 16: Parents' support for and involvement in education	-0.012 (0.054)	-0.021 (0.044)	-0.026 (0.044)	-0.034 (0.044)	-0.048 (0.060)	-0.061 (0.063)	-0.056 (0.059)
Table 17: Number of teachers	0.086 (0.052)	-0.036 (0.037)	-0.073** (0.037)	-0.016 (0.037)	-0.109** (0.048)	-0.089* (0.051)	-0.052 (0.053)

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Table 18: Financial accountability of school management to parents and school committees	-0.045 (0.078)	0.028 (0.054)	0.083 (0.054)	-0.002 (0.054)	0.111 (0.077)	0.081 (0.076)	0.026 (0.069)
Table 19: Principals' performance and management of teachers	-0.041 (0.058)	0.084* (0.044)	0.028 (0.044)	-0.081* (0.044)	0.112* (0.061)	-0.052 (0.057)	0.003 (0.059)
Table 20: Teacher motivation and effort	-0.018 (0.058)	0.061 (0.043)	0.02 (0.044)	-0.03 (0.043)	0.081 (0.059)	-0.01 (0.055)	0.031 (0.062)

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Notes: \*\*\* 1% significance, \*\* 5% significance, \* 10% significance.; robust standard errors in parentheses; estimations are done using weighted OLS.

**Table 7: Impact on drop out, repetition and test scores**

	Baseline mean no. obs	Endline mean no.obs	Grant	Election (ITT)	Election (IV)	Linkage	training	Linkage + Elect(ITT)	Linkage + Elect(IV)	Linkage + Training	Training + Elect (ITT)	Training + Elect (IV)
drop out	0.004 520	0.008 517	-0.005 (0.005)	-0.003 (0.006)	-0.005 (0.011)	-0.002 (0.006)	0.007 (0.006)	-0.005 (0.011)	-0.009 (0.020)	0.004 (0.006)	0.004 (0.006)	0.008 (0.010)
repetition	0.024 520	0.028 517	-0.004 (0.008)	-0.001 (0.005)	-0.003 (0.010)	0.007 (0.005)	-0.006 (0.005)	0.007 (0.008)	0.011 (0.015)	0.001 (0.009)	-0.006 (0.008)	-0.011 (0.014)
Language												
Average	0.037 10982	0.119 11463	0.130 (0.094)	0.047 (0.069)	0.09 (0.127)	0.166** (0.068)	-0.048 (0.069)	0.216** (0.093)	0.379** (0.162)	0.118 (0.087)	0 (0.102)	-0.004 (0.182)
1 (low base score)	-1.242 2196	-0.090 2196	-0.017 (0.149)	0.056 (0.098)	0.107 (0.181)	0.173* (0.097)	-0.027 (0.099)	0.221 (0.14)	0.413 (0.251)	0.15 (0.135)	0.034 (0.145)	0.056 (0.259)
2	-0.577 2196	-0.013 2196	0.061 (0.114)	0.035 (0.086)	0.07 (0.165)	0.057 (0.086)	-0.046 (0.086)	0.087 (0.116)	0.159 (0.21)	0.012 (0.113)	-0.012 (0.12)	-0.029 (0.217)
3	-0.050 2197	0.084 2197	0.111 (0.121)	0.019 (0.089)	0.038 (0.162)	0.156* (0.089)	-0.025 (0.088)	0.177 (0.119)	0.308 (0.202)	0.136 (0.119)	-0.002 (0.126)	-0.006 (0.226)
4	0.546 2196	0.177 2196	0.166 (0.123)	0.036 (0.086)	0.072 (0.16)	0.213** (0.084)	-0.068 (0.085)	0.259** (0.123)	0.457** (0.211)	0.14 (0.107)	-0.029 (0.126)	-0.051 (0.221)
5 (high base score)	1.507 2197	0.457 2197	0.337** (0.143)	0.085 (0.103)	0.147 (0.183)	0.241** (0.101)	-0.086 (0.104)	0.351** (0.143)	0.569** (0.238)	0.146 (0.138)	0.004 (0.15)	-0.001 (0.263)
boys	-0.071 5179	0.095 5435	0.085 (0.105)	0.019 (0.077)	0.036 (0.142)	0.145* (0.077)	-0.048 (0.078)	0.166* (0.1)	0.292* (0.173)	0.098 (0.1)	-0.031 (0.115)	-0.059 (0.204)
girls	0.135 5760	0.142 5982	0.168* (0.094)	0.067 (0.069)	0.128 (0.128)	0.185*** (0.068)	-0.049 (0.069)	0.255** (0.1)	0.447** (0.173)	0.135 (0.088)	0.021 (0.101)	0.034 (0.181)

**Learning outcomes continued**

	Baseline mean no. obs	Endline mean no.obs	Grant	Election (ITT)	Election (IV)	Linkage training	Linkage + Elect(ITT)	Linkage + Elect(IV)	Linkage + Training	Training + Elect (ITT)	Training + Elect (IV)	
Math												
Average	0.072 10982	0.012 11463	-0.022 (0.081)	-0.005 (0.051)	-0.007 (0.094)	0.068 (0.051)	-0.031 (0.051)	0.06 (0.077)	0.111 (0.133)	0.037 (0.069)	-0.037 (0.068)	-0.071 (0.121)
1 (low baseline score)	-0.679 2196	-0.197 2196	-0.052 (0.101)	-0.131 (0.088)	-0.239 (0.163)	0.045 (0.088)	0.018 (0.086)	-0.092 (0.139)	-0.161 (0.253)	0.066 (0.100)	-0.119 (0.101)	-0.221 (0.179)
2	-0.357 2196	-0.186 2196	-0.069 (0.106)	0.04 (0.061)	0.078 (0.117)	0.094 (0.061)	-0.043 (0.060)	0.127 (0.086)	0.229 (0.154)	0.056 (0.081)	-0.004 (0.083)	-0.013 (0.150)
3	0.063 2197	-0.062 2197	-0.025 (0.109)	0.05 (0.060)	0.101 (0.108)	0.05 (0.060)	-0.064 (0.060)	0.101 (0.086)	0.194 (0.142)	-0.017 (0.090)	-0.008 (0.081)	-0.019 (0.146)
4	0.422 2196	0.062 2196	0.036 (0.093)	0.029 (0.064)	0.061 (0.120)	0.055 (0.064)	-0.036 (0.064)	0.086 (0.097)	0.164 (0.168)	0.023 (0.091)	-0.006 (0.092)	-0.003 (0.160)
5 (high baseline score)	0.909 2197	0.477 2197	0.022 (0.152)	-0.028 (0.091)	-0.057 (0.162)	0.108 (0.091)	-0.009 (0.092)	0.079 (0.131)	0.116 (0.215)	0.093 (0.122)	-0.035 (0.130)	-0.076 (0.227)
boys	0.013 5179	0.028 5435	-0.004 (0.085)	-0.026 (0.059)	-0.045 (0.109)	0.022 (0.060)	-0.023 (0.060)	-0.004 (0.092)	-0.002 (0.159)	-0.001 (0.081)	-0.052 (0.074)	-0.097 (0.130)
girls	0.126 5760	-0.002 5982	-0.039 (0.090)	0.011 (0.054)	0.023 (0.100)	0.113** (0.053)	-0.037 (0.054)	0.121 (0.076)	0.217 (0.132)	0.075 (0.074)	-0.026 (0.077)	-0.052 (0.138)

Notes: \*\*\* 1% significance, \*\* 5% significance, \* 10% significance.; robust standard errors in parentheses; estimations that include election are done using weighted 2SLS regressions, the others are done using OLS.

**Table 8: Stakeholder satisfaction with learning**

	Baseline mean no. obs	Endline mean no.obs	Grant	election (ITT)	Election (IV)	Linkage mean	training	Linkage + Elect(ITT)	Linkage + Elect(IV)	Linkage + Training	Training + Elect (ITT)	Training + Elect (IV)
(1) ESCsatlearn	0.556 507	0.550 515	0.012 (0.025)	-0.027 (0.017)	-0.052 (0.033)	-0.003 (0.018)	0.018 (0.017)	-0.03 (0.024)	-0.055 (0.042)	0.018 (0.024)	-0.011 (0.024)	-0.021 (0.042)
(2) EPsatlearnknow	0.815 520	0.903 520	-0.015 (0.033)	0.027 (0.020)	0.056 (0.038)	-0.014 (0.019)	-0.007 (0.020)	0.014 (0.027)	0.033 (0.049)	-0.022 (0.025)	0.02 (0.029)	0.036 (0.052)
(3) ETsatlearn	0.488 520	0.475 489	0.022 (0.026)	-0.01 (0.018)	-0.022 (0.034)	0.024 (0.018)	-0.007 (0.018)	0.014 (0.025)	0.02 (0.044)	0.015 (0.025)	-0.018 (0.025)	-0.034 (0.045)
(4) ESPsatlearn	0.465 520	0.481 518	-0.067*** (0.024)	0.018 (0.017)	0.035 (0.033)	0.013 (0.017)	-0.012 (0.017)	0.028 (0.022)	0.052 (0.040)	0.004 (0.023)	0.006 (0.024)	0.01 (0.044)
(5) compl0			-0.074 (0.075)	-0.008 (0.058)	0.017 (0.109)	0.029 (0.058)	0.006 (0.059)	0.019 (0.074)	0.068 (0.127)	0.041 (0.081)	-0.007 (0.078)	-0.019 (0.140)

Notes: \*\*\* 1% significance, \*\* 5% significance, \* 10% significance.; robust standard errors in parentheses; estimations that include election are done using weighted 2SLS regressions, the others are done using OLS.

**Table 9: Meta analysis of intermediate outcome variables (percent of coefficients which showed a significant effect at 5 percent level or below)**

Number of coefficients analysed in parentheses

	Grant	Election (ITT)	Election (IV)	Linkage	Training	Link + Elect (ITT)	Link + Elect (IV)	Linkage+ Training	Train+ Elect (ITT)	Train+ Elect (IV)
School Committee (25)	0.08	0.00	0.00	0.08	0.00	0.08	0.08	0.08	0.00	0.00
Parents (16)	0.13	0.06	0.06	0.06	0.06	0.06	0.13	0.06	0.00	0.00
Teachers (15)	0.00	0.20	0.20	0.13	0.00	0.20	0.20	0.07	0.07	0.07
School Principal (16)	0.13	0.00	0.00	0.25	0.06	0.13	0.13	0.19	0.00	0.00

Sum	0.33	0.26	0.26	0.53	0.13	0.47	0.53	0.40	0.07	0.07
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**Table 10: School committee meetings with education stakeholders**

	Baseline mean no. obs	Endline mean no.obs	Grant	election (ITT)	Election (IV)	Linkage	training	Linkage + Elect(ITT)	+Linkage + Elect(IV)	Linkage + Training	Training + Elect (ITT)	Training + Elect (IV)
(1) ESCmeettripartite	2.046 520	2.236 517	-0.071 (0.248)	0.043 (0.143)	0.081 (0.269)	-0.082 (0.144)	-0.027 (0.141)	-0.074 (0.163)	-0.131 (0.292)	-0.110 (0.192)	0.036 (0.200)	0.067 (0.363)
(2) ESCmeetprincipaltot	3.321 520	4.837 350	0.174 (0.506)	0.150 (0.362)	0.275 (0.681)	0.177 (0.357)	0.505 (0.367)	0.212 (0.517)	0.373 (0.928)	0.712 (0.494)	0.563 (0.592)	1.011 (1.074)
(3) ESCintmeettot	1.496 520	1.807 517	0.947** (0.375)	0.240 (0.298)	0.447 (0.562)	-0.382 (0.298)	0.478* (0.287)	-0.254 (0.405)	-0.466 (0.729)	0.165 (0.422)	0.556 (0.429)	0.999 (0.778)
(4) ESCmeetparents	0.150 520	0.195 517	0.116 (0.174)	-0.018 (0.065)	-0.034 (0.122)	-0.099 (0.064)	0.096* (0.058)	-0.124 (0.112)	-0.223 (0.202)	-0.000 (0.087)	0.073 (0.080)	0.132 (0.145)
(5) ESCmeetdinas	0.973 520	0.627 517	0.320** (0.160)	-0.094 (0.081)	-0.175 (0.153)	-0.199** (0.083)	-0.057 (0.085)	-0.311*** (0.113)	-0.555*** (0.205)	-0.280** (0.117)	-0.189 (0.123)	-0.339 (0.223)
(6) ESCmeetcomm	0.236 520	0.306 517	0.059 (0.038)	0.003 (0.032)	0.006 (0.060)	0.046 (0.032)	-0.012 (0.032)	0.042 (0.044)	0.077 (0.078)	0.027 (0.041)	-0.017 (0.044)	-0.029 (0.081)
(7) ESCmeetbpd	0.327 520	0.426 517	0.100 (0.067)	0.022 (0.049)	0.045 (0.093)	0.047 (0.049)	-0.003 (0.050)	0.057 (0.067)	0.109 (0.119)	0.038 (0.068)	0.015 (0.069)	0.035 (0.125)
(8) ESPmeetsc	5.136 520	5.959 518	0.175 (0.776)	0.816 (0.756)	1.558 (1.422)	-0.374 (0.723)	-0.431 (0.698)	0.368 (0.936)	0.709 (1.665)	-0.711 (0.972)	0.208 (1.012)	0.361 (1.829)
(9) ETscmeet	1.712 520	2.255 518	0.098 (0.306)	0.362 (0.220)	0.687* (0.416)	0.017 (0.210)	0.146 (0.216)	0.389 (0.246)	0.710 (0.446)	0.128 (0.297)	0.541 (0.362)	0.997 (0.656)
(10) compl18			0.180** (0.077)	0.045 (0.053)	0.086 (0.099)	-0.047 (0.052)	0.051 (0.052)	-0.026 (0.075)	-0.041 (0.134)	0.003 (0.073)	0.073 (0.073)	0.134 (0.131)

Notes: \*\*\* 1% significance, \*\* 5% significance, \* 10% significance.; robust standard errors in parentheses; estimations that include election are done using weighted 2SLS regressions, the others are done using OLS.

**Table 11: Stakeholder opinions about school committee effectiveness**

	Baseline mean no. obs	Endline mean no.obs	Grant	election (ITT)	Election (IV)	Linkage	training	Linkage Elect(ITT)	+Linkage + Elect(IV)	Linkage + Training	Training + Elect (ITT)	Training + Elect (IV)
(1) ESPsceffective	0.578 484	0.590 517	0.018 (0.017)	0.014 (0.010)	0.028 (0.019)	0.003 (0.011)	-0.005 (0.010)	0.017 (0.014)	0.035 (0.025)	-0.005 (0.014)	0.009 (0.014)	0.016 (0.024)
(2) ESCposcontr	0.817 520	0.789 517	-0.027 (0.068)	0.028 (0.042)	0.053 (0.079)	0.032 (0.043)	-0.005 (0.042)	0.051 (0.059)	0.094 (0.106)	0.034 (0.062)	0.019 (0.057)	0.037 (0.101)
(3) ETscperception	0.795 517	0.819 510	-0.028 (0.022)	0.025** (0.012)	0.046** (0.023)	0.016 (0.013)	0.012 (0.012)	0.036* (0.019)	0.064* (0.033)	0.029* (0.017)	0.038** (0.016)	0.067** (0.028)
(4) compl1			-0.027 (0.105)	0.160** (0.062)	0.293** (0.117)	0.078 (0.065)	0.013 (0.062)	0.214** (0.095)	0.379** (0.173)	0.09 (0.090)	0.176** (0.082)	0.313** (0.145)

Notes: \*\*\* 1% significance, \*\* 5% significance, \* 10% significance.; robust standard errors in parentheses; estimations that include election are done using weighted 2SLS regressions, the others are done using OLS.

**Table 12: Village council's collaboration with schools and overall support for education in the village**

	Baseline mean no. obs	Endline mean no.obs	Grant	election (ITT)	Election (IV)	Linkage	training	Linkage Elect(ITT)	+Linkage Elect(IV)	+Linkage Training	+Training + Elect (ITT)	Training + Elect (IV)
(1) ESCbpd	0.224 490	0.406 498	0.041 (0.071)	0.065 (0.058)	0.123 (0.110)	0.193*** (0.057)	0.04 (0.058)	0.276*** (0.080)	0.495*** (0.145)	0.235*** (0.078)	0.093 (0.078)	0.166 (0.140)
(2) ESCsatbpd	0.442 467	0.503 485	0.013 (0.038)	0.018 (0.026)	0.035 (0.048)	-0.050* (0.026)	0.019 (0.026)	-0.041 (0.037)	-0.074 (0.066)	-0.032 (0.035)	0.035 (0.033)	0.063 (0.059)
(3) ESPbpd	0.195 522	0.378 518	0.105 (0.064)	0.011 (0.058)	0.03 (0.111)	0.276*** (0.055)	0.107* (0.058)	0.298*** (0.080)	0.559*** (0.149)	0.402*** (0.073)	0.109 (0.078)	0.196 (0.140)
(4) ESPsatbpd	0.402 427	0.475 459	-0.047 (0.037)	0.013 (0.027)	0.031 (0.049)	0.064** (0.026)	0.019 (0.027)	0.080** (0.036)	0.156** (0.064)	0.084** (0.036)	0.032 (0.037)	0.057 (0.065)
(5) compl5			0.081 (0.107)	0.046 (0.091)	0.117 (0.172)	0.340*** (0.089)	0.126 (0.089)	0.395*** (0.128)	0.776*** (0.230)	0.489*** (0.113)	0.159 (0.123)	0.285 (0.220)

Notes: \*\*\* 1% significance, \*\* 5% significance, \* 10% significance.; robust standard errors in parentheses; estimations that include election are done using weighted 2SLS regressions, the others are done using OLS.

**Table 13: Community support for schools and school committees**

	Baseline mean no. obs	Endline mean no. obs	Grant	election (ITT)	Election (IV)	Linkage	training	Linkage + Elect(ITT)	Linkage + Elect(IV)	Linkage + Training	Training + Elect (ITT)	Training + Elect (IV)
(1) ESCsatcomm	0.609 520	0.616 517	-0.017 (0.022)	-0.02 (0.016)	-0.037 (0.031)	0.004 (0.017)	-0.015 (0.016)	-0.014 (0.022)	-0.025 (0.039)	-0.01 (0.022)	-0.031 (0.021)	-0.056 (0.039)
(2) ESCnonbpd	0.319 520	0.441 517	-0.024 (0.076)	-0.025 (0.051)	-0.049 (0.097)	-0.028 (0.051)	0.008 (0.051)	-0.037 (0.070)	-0.073 (0.125)	-0.022 (0.070)	-0.023 (0.072)	-0.045 (0.130)
(3) ESCcomfundraise	0.430 520	1.194 517	-0.045 (0.104)	-0.852 (0.636)	-1.600 (1.200)	-0.395 (0.737)	-0.265 (0.580)	-0.057 (0.097)	-0.106 (0.175)	-0.357 (1.162)	-0.281 (0.235)	-0.509 (0.428)
(4) ESCcominkind	0.071 520	0.057 517	-0.012 (0.020)	-0.01 (0.014)	-0.016 (0.027)	0.009 (0.014)	0.018 (0.014)	-0.003 (0.020)	0.002 (0.035)	0.026 (0.017)	0.006 (0.021)	0.017 (0.037)
(5) ESPsatcomm	0.579 520	0.577 518	-0.041* (0.023)	-0.011 (0.019)	-0.016 (0.035)	-0.004 (0.019)	0.004 (0.019)	-0.009 (0.027)	-0.008 (0.048)	0 (0.028)	-0.009 (0.024)	-0.014 (0.044)
(6) ESPnonbpd	0.546 522	0.654 518	-0.073 (0.074)	-0.02 (0.048)	-0.032 (0.091)	-0.045 (0.048)	0.111** (0.048)	-0.051 (0.067)	-0.08 (0.121)	0.06 (0.066)	0.085 (0.065)	0.148 (0.118)
(7) EPsatcomm	0.624 506	0.629 517	-0.005 (0.014)	0.003 (0.009)	0.005 (0.017)	0.028*** (0.009)	0.012 (0.009)	0.032*** (0.012)	0.061*** (0.022)	0.041*** (0.011)	0.017 (0.013)	0.031 (0.023)
(8) ETsatcomm	0.580 520	0.560 491	-0.012 (0.030)	0.02 (0.019)	0.039 (0.036)	0.008 (0.019)	-0.002 (0.019)	0.032 (0.027)	0.06 (0.048)	0.005 (0.026)	0.018 (0.026)	0.031 (0.048)
(9) compl3			-0.102	-0.088	-0.065	0.037	0.092*	-0.038	0.064	0.133**	0.005	0.014

Notes: \*\*\* 1% significance, \*\* 5% significance, \* 10% significance.; robust standard errors in parentheses; estimations that include election are done using weighted 2SLS regressions, the others are done using OLS.

**Table 14: Parents' financial and in-kind support for school committees**

	Baseline mean no. obs	Endline mean no. obs	Grant	election (ITT)	Election (IV)	Linkage	training	Linkage + Elect(ITT)	Linkage + Elect(IV)	Linkage + Training	Training + Elect (ITT)	Training + Elect (IV)
(1) ESCparfundraise	0.488 520	1.202 517	-1.226 (1.118)	-0.177 (0.380)	-0.289 (0.717)	0.296 (0.403)	0.592 (0.364)	0.062 (0.335)	0.194 (0.591)	0.916 (0.688)	0.447 (0.285)	0.889* (0.502)
(2) ESCparinkind	0.185 520	0.186 517	0.029 (0.049)	-0.047 (0.040)	-0.089 (0.076)	0.019 (0.041)	0.079* (0.041)	-0.033 (0.052)	-0.061 (0.093)	0.099* (0.055)	0.031 (0.054)	0.055 (0.096)
(3) ESCsizeinkind	0.132 520	0.129 517	0.003 (0.034)	-0.015 (0.029)	-0.03 (0.054)	0.013 (0.029)	0.048* (0.029)	-0.005 (0.038)	-0.011 (0.068)	0.063 (0.038)	0.031 (0.037)	0.055 (0.066)
(4) EPcont	7235.893 521	6240.064 520	-3000.00 (2538.669)	4768.639 (3019.545)	9046.909 (5766.272)	2316.313 (2563.577)	83.987 (2863.291)	6655.392 (4317.101)	12000.00 (7818.892)	2112.965 (1549.086)	4248.567 (3556.873)	7655.532 (6382.711)
(5) EPcont_physical	0.114 521	0.122 520	0.025 (0.034)	0.023 (0.023)	0.042 (0.044)	-0.037 (0.023)	-0.009 (0.023)	-0.015 (0.031)	-0.031 (0.056)	-0.048 (0.031)	0.014 (0.034)	0.024 (0.061)
(6) compl2			0.049 (0.079)	0.003 (0.060)	-0.001 (0.114)	0.016 (0.059)	0.066 (0.060)	0.011 (0.076)	0.007 (0.136)	0.083 (0.077)	0.063 (0.082)	0.111 (0.146)

Notes: \*\*\* 1% significance, \*\* 5% significance, \* 10% significance.; robust standard errors in parentheses; estimations that include election are done using weighted 2SLS regressions, the others are done using OLS.

**Table 15: Parents' awareness of school committees**

	Baseline mean no. obs	Endline mean no. obs	Grant	Election (ITT)	Election (IV)	Linkage	training	Linkage + Elect(ITT)	Linkage + Elect(IV)	Linkage + Training	Training + Elect (ITT)	Training + Elect (IV)
(1) EPknow_scexist	0.529 520	0.656 520	0.132*** (0.042)	0.055* (0.029)	0.107* (0.054)	0.02 (0.029)	0.01 (0.029)	0.074* (0.040)	0.145** (0.071)	0.027 (0.038)	0.064 (0.040)	0.115 (0.072)
(2) EPknow_smem	0.214 520	0.285 520	0.078*** (0.024)	0.022 (0.018)	0.042 (0.034)	0.024 (0.018)	-0.008 (0.018)	0.045* (0.025)	0.085* (0.046)	0.013 (0.026)	0.015 (0.023)	0.028 (0.041)
(3) EPscanswer	0.613 520	0.655 520	0.072 (0.044)	0.026 (0.027)	0.051 (0.052)	-0.008 (0.027)	0.003 (0.027)	0.018 (0.038)	0.044 (0.068)	-0.005 (0.038)	0.031 (0.038)	0.06 (0.067)
(4) compl17			0.320*** (0.106)	0.112 (0.070)	0.217 (0.133)	0.049 (0.071)	-0.001 (0.071)	0.159 (0.099)	0.316* (0.178)	0.042 (0.097)	0.115 (0.097)	0.212 (0.174)

Notes: \*\*\* 1% significance, \*\* 5% significance, \* 10% significance.; robust standard errors in parentheses; estimations that include election are done using weighted 2SLS regressions, the others are done using OLS.

**Table 16: Parents' support for and involvement in education**

	Baseline mean no. obs	Endline mean no.obs	Grant	election (ITT)	Election (IV)	Linkage	training	Linkage + Elect(ITT)	Linkage + Elect(IV)	Linkage + Training	Training + Elect (ITT)	Training + Elect (IV)
(1) EPmeet_teacher	0.463 521	0.577 520	0.265 (0.161)	-0.003 (0.184)	-0.03 (0.352)	0.19 (0.193)	-0.162 (0.162)	0.181 (0.232)	0.285 (0.412)	-0.012 (0.225)	-0.166 (0.284)	-0.32 (0.525)
(2) EPvisit	0.109 521	0.111 520	0.050* (0.029)	-0.016 (0.019)	-0.037 (0.036)	0.009 (0.020)	-0.039** (0.020)	-0.013 (0.027)	-0.031 (0.048)	-0.028 (0.025)	-0.044 (0.028)	-0.083 (0.051)
(3) EPallhh_min	263.706 521	272.139 520	-1.202 (49.844)	77.885** (33.193)	146.842** (64.037)	18.27 (34.988)	23.81 (39.150)	80.276 (55.466)	148.465 (102.723)	65.279 (65.448)	104.352* (57.579)	192.158* (105.823)
(4) EPsatparents	0.617 508	0.625 520	0.002 (0.014)	0.012 (0.009)	0.022 (0.016)	0.008 (0.009)	0.005 (0.008)	0.019 (0.013)	0.033 (0.024)	0.018 (0.011)	0.017 (0.012)	0.031 (0.022)
(5) EPchildatt	0.702 520	0.704 520	0.005 (0.016)	0.009 (0.010)	0.017 (0.020)	-0.003 (0.010)	-0.007 (0.010)	0.012 (0.015)	0.021 (0.026)	-0.011 (0.014)	-0.005 (0.014)	-0.008 (0.025)
(6) ESCsat parents	0.587 520	0.589 517	-0.047* (0.026)	0.003 (0.017)	0.005 (0.033)	0.024 (0.017)	0.014 (0.017)	0.021 (0.022)	0.038 (0.041)	0.035 (0.023)	0.017 (0.021)	0.03 (0.039)
(7) ESPsatpar	0.547 520	0.530 518	-0.039 (0.026)	-0.014 (0.020)	-0.023 (0.038)	0.016 (0.020)	-0.005 (0.020)	0.009 (0.025)	0.023 (0.046)	0.017 (0.029)	-0.029 (0.026)	-0.051 (0.048)
(8) ESPparents involve	0.527 520	0.520 518	0.016 (0.018)	0.013 (0.014)	0.025 (0.026)	-0.002 (0.013)	0.013 (0.014)	0.017 (0.016)	0.029 (0.029)	0.019 (0.020)	0.022 (0.017)	0.04 (0.031)
(9) ETsatpar	0.507 520	0.502 491	0.031 (0.032)	0.004 (0.020)	0.011 (0.038)	0.019 (0.020)	0.023 (0.020)	0.024 (0.029)	0.05 (0.051)	0.048 (0.029)	0.016 (0.026)	0.03 (0.048)
(10) ETparents perception	0.577 518	0.517 518	-0.059 (0.079)	0.005 (0.051)	0.008 (0.097)	0.014 (0.051)	0.028 (0.051)	0.016 (0.072)	0.025 (0.130)	0.023 (0.069)	0.029 (0.071)	0.057 (0.129)
(11) ETparents perception1	0.533 519	0.508 517	0.02 (0.028)	0.014 (0.018)	0.03 (0.034)	0.002 (0.018)	0.01 (0.018)	0.018 (0.025)	0.038 (0.044)	0.014 (0.025)	0.019 (0.026)	0.036 (0.047)
(12) EShome support	0.806 520	0.784 520	0.043* (0.026)	0.017 (0.017)	0.027 (0.033)	-0.031* (0.017)	-0.004 (0.017)	-0.019 (0.023)	-0.041 (0.042)	-0.029 (0.022)	0.005 (0.023)	0.01 (0.042)

(13) compl4		0.043	0.053	0.096	0.04	0.009	0.092*	0.158*	0.069	0.044	0.083
		(0.060)	(0.040)	(0.077)	(0.039)	(0.039)	(0.052)	(0.095)	(0.056)	(0.054)	(0.098)

Notes: \*\*\* 1% significance, \*\* 5% significance, \* 10% significance.; robust standard errors in parentheses; estimations that include election are done using weighted 2SLS regressions, the others are done using OLS.

Table 17: Number of teachers

	Baseline	Endline	Grant	election	Election	Linkage	training	Linkage +	Linkage	+Linkage	+Training+	Training+
	mean	mean		(ITT)	(IV)			Elect(ITT)	Elect(IV)	Training	Elect (ITT)	Elect (IV)
	no. obs	no.obs										
(1) EPNSteach	7.079	7.441	-0.142	-0.145	-0.269	-0.015	0.114	-0.128	-0.218	0.102	-0.049	-0.088
	520	517	(0.156)	(0.098)	(0.184)	(0.094)	(0.098)	(0.127)	(0.227)	(0.132)	(0.124)	(0.221)
(2) EGTTeach_govt	0.469	0.669	0.029	0.061	0.117	0	-0.042	0.06	0.112	-0.03	0.021	0.038
	520	517	(0.119)	(0.079)	(0.149)	(0.081)	(0.080)	(0.122)	(0.215)	(0.104)	(0.111)	(0.199)
(3) EGTTeach_school	1.350	2.019	0.116	-0.109	-0.197	-0.121	-0.075	-0.237	-0.402	-0.199	-0.186	-0.332
	520	517	(0.188)	(0.119)	(0.225)	(0.121)	(0.118)	(0.171)	(0.304)	(0.167)	(0.163)	(0.293)
(4) compl7			0.011	-0.025	-0.045	-0.027	-0.011	-0.049	-0.081	-0.035	-0.039	-0.07
			(0.050)	(0.031)	(0.058)	(0.031)	(0.031)	(0.042)	(0.075)	(0.044)	(0.041)	(0.074)

Notes: \*\*\* 1% significance, \*\* 5% significance, \* 10% significance.; robust standard errors in parentheses; estimations that include election are done using weighted 2SLS regressions, the others are done using OLS.

**Table 18: Financial accountability of school management to parents and school committees**

	Baseline mean no. obs	Endline mean no. obs	Grant	election (ITT)	Election (IV)	Linkage	training	Linkage Elect(ITT)	+ Linkage Elect(IV)	+ Linkage Training	+ Training Elect (ITT)	+ Training Elect (IV)
(1) ESCrapbs	0.752 520	0.777 517	0.026 (0.055)	-0.02 (0.036)	-0.037 (0.067)	-0.035 (0.035)	0.012 (0.035)	-0.05 (0.050)	-0.085 (0.088)	-0.029 (0.051)	-0.004 (0.053)	-0.005 (0.094)
(2) ESCrecrepabs	0.938 520	0.919 517	0.058 (0.045)	-0.012 (0.026)	-0.022 (0.048)	0.007 (0.025)	-0.044* (0.026)	0.002 (0.035)	0.004 (0.061)	-0.039 (0.039)	-0.062 (0.039)	-0.109 (0.069)
(3) ESCdistrapbs	0.794 516	0.724 512	-0.028 (0.056)	-0.044 (0.037)	-0.084 (0.069)	0.029 (0.037)	0.011 (0.037)	0.008 (0.053)	0.012 (0.092)	0.03 (0.054)	-0.044 (0.054)	-0.081 (0.097)
(4) ESPinviterapbs	0.572 520	0.589 518	0.043* (0.024)	-0.01 (0.018)	-0.019 (0.034)	-0.001 (0.018)	-0.015 (0.018)	-0.008 (0.026)	-0.014 (0.045)	-0.014 (0.024)	-0.019 (0.024)	-0.033 (0.043)
(5) ESPparentrapbs	0.787 517	0.769 518	0.100** (0.050)	-0.033 (0.033)	-0.063 (0.063)	0.083** (0.032)	-0.036 (0.033)	0.048 (0.046)	0.081 (0.079)	0.049 (0.048)	-0.062 (0.045)	-0.118 (0.081)
(6) EPmtgrapbs	0.368 511	0.420 507	0.032 (0.054)	-0.031 (0.039)	-0.058 (0.073)	0.005 (0.039)	0.01 (0.040)	0.004 (0.053)	0.012 (0.093)	0.018 (0.049)	-0.036 (0.056)	-0.066 (0.099)
(7) EPrapbs	0.367 520	0.337 520	0.071 (0.045)	-0.019 (0.029)	-0.033 (0.055)	0.018 (0.029)	-0.01 (0.029)	0.015 (0.044)	0.027 (0.078)	0.008 (0.040)	-0.04 (0.042)	-0.074 (0.075)
(8) compl11			0.148** (0.072)	-0.062 (0.049)	-0.135 (0.091)	0.03 (0.048)	-0.049 (0.050)	0.002 (0.068)	0.002 (0.120)	-0.022 (0.068)	-0.118* (0.071)	-0.214* (0.128)

Notes: \*\*\* 1% significance, \*\* 5% significance, \* 10% significance.; robust standard errors in parentheses; estimations that include election are done using weighted 2SLS regressions, the others are done using OLS.

**Table 19: Principals' performance and management of teachers**

	Baseline mean no. obs	Endline mean no.obs	Grant	election (ITT)	Election (IV)	Linkage mean	training	Linkage + Elect(ITT)	+ Linkage + Elect(IV)	Linkage + Training	Training + Elect (ITT)	Training + Elect (IV)
(1) ESPmeetteach	6.649 522	12.245 518	-0.059 (0.723)	-0.351 (0.596)	-0.645 (1.138)	1.144* (0.611)	0.230 (0.704)	0.704 (0.825)	1.295 (1.496)	1.129 (0.722)	-0.563 (0.840)	-1.039 (1.520)
(2) ETprincmeet	10.696 516	11.848 512	-1.599 (1.005)	1.821** (0.720)	3.522** (1.400)	0.697 (0.646)	-0.577 (0.706)	2.202** (0.876)	4.020** (1.628)	0.189 (0.790)	0.772 (0.946)	1.387 (1.709)
(3) ESPteacheval	0.728 520	0.745 518	0.002 (0.037)	-0.022 (0.026)	-0.045 (0.049)	0.001 (0.026)	-0.022 (0.026)	-0.029 (0.033)	-0.060 (0.060)	-0.018 (0.033)	-0.044 (0.037)	-0.085 (0.067)
(4) ETprinceval	0.675 520	0.688 518	-0.085 (0.058)	0.010 (0.038)	0.014 (0.074)	-0.032 (0.038)	0.055 (0.039)	-0.025 (0.056)	-0.053 (0.101)	0.032 (0.054)	0.046 (0.056)	0.078 (0.100)
(5) ETprincipal	0.840 514	0.836 512	-0.020 (0.020)	0.000 (0.013)	-0.000 (0.024)	0.022* (0.012)	0.016 (0.012)	0.022 (0.018)	0.039 (0.033)	0.037** (0.016)	0.015 (0.019)	0.026 (0.034)
(6) ESPteachaward	0.239 515	0.238 518	-0.008 (0.020)	-0.006 (0.011)	-0.015 (0.021)	0.027** (0.011)	0.015 (0.011)	0.024 (0.015)	0.037 (0.027)	0.044*** (0.016)	0.006 (0.016)	0.010 (0.029)
(7) ESPteachaccount	0.267 522	0.260 518	0.002 (0.017)	-0.002 (0.011)	-0.004 (0.022)	0.005 (0.011)	-0.001 (0.012)	-0.001 (0.015)	-0.002 (0.028)	0.013 (0.015)	0.001 (0.017)	0.002 (0.031)
(8) ETreward	0.032 516	0.030 516	0.024* (0.013)	-0.005 (0.008)	-0.007 (0.016)	-0.018** (0.009)	0.000 (0.008)	-0.022* (0.013)	-0.036 (0.023)	-0.017 (0.013)	-0.006 (0.010)	-0.007 (0.018)
(9) ETaccount	0.038 518	0.033 516	0.013 (0.012)	-0.006 (0.008)	-0.010 (0.016)	-0.021*** (0.008)	0.002 (0.008)	-0.026** (0.012)	-0.045** (0.023)	-0.018* (0.010)	-0.006 (0.010)	-0.009 (0.018)
(10) ESCprinceffort	0.851 504	0.813 509	-0.027 (0.044)	0.020 (0.033)	0.036 (0.062)	-0.056* (0.033)	-0.020 (0.033)	-0.041 (0.044)	-0.078 (0.080)	-0.070 (0.044)	0.004 (0.044)	0.001 (0.080)
(11) compl10			-0.032 (0.076)	0.004 (0.043)	0.005 (0.083)	0.004 (0.043)	0.030 (0.042)	-0.005 (0.060)	-0.011 (0.108)	0.047 (0.056)	0.010 (0.060)	0.019 (0.108)

Notes: \*\*\* 1% significance, \*\* 5% significance, \* 10% significance.; robust standard errors in parentheses; estimations that include election are done using weighted 2SLS regressions, the others are done using OLS.

**Table 20: Teacher motivation and effort**

	Baseline mean no. obs	Endline mean no.obs	Grant	election (ITT)	Election (IV)	Linkage	training	Linkage +Linkage + Elect(ITT)	+Linkage + Elect(IV)	Linkage + Training	Training + Elect (ITT)	Training + Elect (IV)
(1) ESCsatteachers	0.622 519	0.618 517	-0.018 (0.020)	-0.010 (0.014)	-0.018 (0.027)	0.009 (0.014)	0.005 (0.014)	-0.004 (0.021)	-0.007 (0.038)	0.015 (0.020)	-0.005 (0.019)	-0.009 (0.034)
(2) ESCtechnoprob	0.852 520	0.801 517	0.020 (0.057)	0.014 (0.041)	0.028 (0.077)	0.022 (0.040)	-0.002 (0.040)	0.036 (0.055)	0.067 (0.099)	0.024 (0.054)	0.019 (0.052)	0.036 (0.095)
(3) ESPsatteach	0.618 520	0.617 518	-0.008 (0.021)	0.021 (0.014)	0.037 (0.027)	0.013 (0.014)	0.001 (0.014)	0.031 (0.020)	0.051 (0.035)	0.016 (0.018)	0.020 (0.019)	0.034 (0.034)
(4) ETsatteach	0.645 520	0.619 492	-0.009 (0.019)	0.005 (0.015)	0.008 (0.027)	0.022 (0.015)	-0.014 (0.015)	0.026 (0.022)	0.041 (0.039)	0.009 (0.022)	-0.011 (0.022)	-0.023 (0.039)
(5) EPsatteachers	0.643 515	0.641 519	0.002 (0.011)	0.002 (0.007)	0.005 (0.014)	0.004 (0.007)	0.009 (0.007)	0.008 (0.011)	0.016 (0.020)	0.011 (0.009)	0.011 (0.010)	0.020 (0.017)
(6) EPteacherperception	0.595 517	0.617 520	-0.016 (0.012)	0.001 (0.009)	0.001 (0.017)	-0.007 (0.009)	-0.002 (0.009)	-0.007 (0.013)	-0.015 (0.024)	-0.008 (0.013)	0.000 (0.012)	0.001 (0.022)
(7) EThours	6.230 520	6.190 517	0.131 (0.428)	0.627** (0.283)	1.213** (0.527)	0.485* (0.284)	0.148 (0.288)	1.057*** (0.377)	1.992*** (0.691)	0.748* (0.412)	0.764* (0.396)	1.365* (0.718)
(8) ETmeetparents	1.473 520	2.288 518	-1.215 (0.885)	-0.595 (0.574)	-1.122 (1.074)	-0.378 (0.400)	0.615 (0.431)	-1.117 (0.807)	-2.018 (1.453)	0.198 (0.396)	0.302 (0.430)	0.539 (0.776)
(9) EOBfractwithteach	0.866 510	0.831 507	0.017 (0.031)	-0.049** (0.021)	-0.092** (0.040)	0.005 (0.021)	-0.017 (0.022)	-0.041 (0.028)	-0.073 (0.050)	-0.009 (0.026)	-0.068** (0.031)	-0.123** (0.056)
(10) compl9			-0.044 (0.052)	0.022 (0.040)	0.038 (0.074)	0.053 (0.038)	0.002 (0.039)	0.064 (0.054)	0.110 (0.099)	0.064 (0.053)	0.029 (0.052)	0.049 (0.094)

Notes: \*\*\* 1% significance, \*\* 5% significance, \* 10% significance.; robust standard errors in parentheses; estimations that include election are done using weighted 2SLS regressions, the others are done using OLS.