School Resources, Behavioral Responses and School Quality: Short-Term Experimental Evidence from Niger *

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Abstract

Increasing school resources has often shown disappointing effects on school quality in developing countries, a lack of impact which may be due to student, parent or teacher behavioral responses. We test the short-term impact of an increase in school resources under parental control using an experimental school grant program in Niger. We find that parents supplemented the grant with their own inputs and increased their participation in school management, while teachers reduced their presence at school. We also find that schools where parents have higher authority have a higher response to the grant. We provide a model of school quality to explain together those results and existing results in the literature, where the amount of authority that the parents have influences school quality and behavioral responses. This framework makes explicit some conditions under which different educational policies should increase school quality.

JEL Codes: H52, 015, I21, I28

1 Introduction

The explosion in access to schools in the last two decades represents an unprecedented effort to increase education in poor countries. However, the quality of education is often low, and in some cases getting worse as participation increases. Poor quality can result from poor physical infrastructure (such as rudimentary buildings without access to water, electricity or latrines), lack of recurrent

inputs (for example, delays in teacher salary, large class-size or lack of educational materials), and ineffective or absent staff.[1] Governments of poor countries must face the issue of improving quality from a perspective of resource constraints, both financial and in terms of human resources.

Attention has increasingly turned to beneficiary participation as a means to improve service quality, in part because increasing inputs without changing management structures and processes have not been as successful as hoped. The input-based approach has had little impact on test scores. Hanushek (2003) details the lack of a clear relationship between resources and school outcomes internationally and at the US level, using data from international math and science tests. In randomized evaluations, Glewwe, Kremer and Moulin (2009) find no impact from a program to increase textbooks; Glewwe, Kremer, Moulin and Zitzewitz (2004) find no impact from flip charts; Banerjee et al. (2002) find no impact from additional teachers in India; and Duflo, Dupas and Kremer (2012) find no effect of decreasing the teacher-pupil ratio (absent other reforms) in Kenya. There is a growing concern that the lack of effect of the additional resources is due to indirect effects through changes in teacher or parent behavior. An infusion of resources or a change in effort from one of the actors can lead to a change in the level of investment of the other actors. For instance, parents in Romania decreased time spent on homework when their child accessed a better school (Pop-Eleches and Urquiola, 2012). In Zambia, households decreased spending for education when they anticipated an increase in school funding (Das et al., 2011). In Kenya, civil-servant teachers decreased presence at school when school committee hired an extra-teacher (Duflo, Dupas and Kremer, 2012). In this context, evidence on behavioral responses is crucial to evaluate educational policies, and estimates of the impact of governmental resources on educational outcomes that would not take into account agents' re-optimization would be considerably biased.

Involving parents in the management of schools and giving them the responsibility over school resources might be a better option for three reasons. First, the information problems that contribute to government failures at the central level are likely to be less acute at the community level. Second, communities have a stronger incentive to demand high quality service than the central government, since they benefit directly from that service, whereas the central government benefits only indirectly. Third, parents might be less likely to substitute school resources for their own effort when they are involved in school management. Involving parents in school might thus be a way to both improve the use of school resources, and limit adverse behavioral responses. However, the extent to which

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[1]Chaudhury et al (2006) surveyed attendance in six countries and found 19% of teachers absent during spot checks.

participation programs can meet these expectations depends in no small part on the willingness, ability and authority of parents: it may be costly and time-consuming to gather local information, and may be very difficult in practice to put pressure on teachers to improve service quality. The extent to which beneficiaries will be able to surmount these difficulties is likely to depend on the characteristics of the community and in particular the dynamics of the relationship between the people who are beneficiaries and the person who is performing the service.

The perception that the advantages of community participation will likely dominate these obstacles is common among many who work in public service in developing countries. The 2004 World Development Report was devoted to the idea of "putting the poor at the center of service provision" with the strong belief that "giving parents voice over their children's education, patients a say over hospital management, making agency budgets transparent–all contribute to improving outcomes in human development". Community-based management policies have been widely adopted throughout the world over the past decade[2]. In countries including Kenya, Madagascar, Mali, Uganda, and Burkina Faso, governments and NGOs have organized citizens into multitudes of local committees for schools, clinics, and local infrastructure, and giving these committees varying levels of power over resource allocation, monitoring, and management.

Despite the enthusiasm of policymakers for participation programs, the empirical question of whether, and under what conditions, community participation can improve service quality remains unresolved. The existing results are mixed and suggest that the success of participatory programs is highly context dependent. Di Gropello (2006) overviews four school-based management programs in Latin America and concludes that school-based management models have led generally to greater community empowerment and teacher effort, resulting in a better use of the existing limited capacity of teachers and schools, somewhat better student flows and learning outcomes at least as high as in traditional schools, though the application of the analysis is limited due to possible selection bias. In India, Banerjee et al (2010) report that providing information to parents about the role and the activities of school committee and training the community to record educational performances in the community had no impact on the activity of school committees, and therefore no impact on education outcomes. In Madagascar, Lassibille et al (2010) find that streamlining management practices combined with facilitating community/school interactions had positive im-

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[2]School-based management programs have been implemented in Argentina, Australia, Bangladesh, Canada, Guatemala, Honduras, Hong-Kong, India, Lebanon, Lesotho, Macedonia, Madagascar, Mexico, Nicaragua, the Philippines, Senegal, Serbia, Sri Lanka, the Gambia, the United Kingdom, and the United States (Duflo et al, 2012).

pacts on attendance and learning. In addition to the uncertain effect of involving beneficiaries in monitoring schools, there is no evidence (to the best of our knowledge) on how the participation of parents in school resource management affects behavioral responses to an increase in school resources: do parents keep lowering their effort, or does the responsibility over the resources change their behavior? How do teachers react to reforms that give parents more power?

This paper makes two contributions. First, it provides evidence on the short-term effect of an increase in school resources under parental control on parent and teacher behavior, and some aspects of school quality, using a randomized control trial in Niger. In addition to the average treatment effect, we explore the role of power imbalances in amplifying or reducing parent and teacher responses. Second, it provides a theoretical framework that formalizes parent and teacher behavior in school in order to clarify how a change in school resources (either under teacher or under parent control) eventually affects school quality, explaining both our results and the existing results in the literature. This framework also provides some structure for the idea that power relationships between teachers and communities change behavioral responses and the resulting efficacy of education policy.

In 2007-2008, the Nigerien Ministry of Education of Niger increased the resources under the control of the school committees with the aim to increase the quality of education. All school committees in this experiment had been trained on how to manage schools, and the grant was planned to increase the capacity of the school committee to undertake actions by increasing the school committee's resources. We use detailed information on parent contributions to school and participation in school management, teacher presence in school, school quality and enrollment to evaluate the impact of the grant. An important limitation of the study is that it provides only short-term evidence on behavioral responses: the first grant arrived late 2007 and was meant to continue over years, but a political coup occurred in 2009 and both the program and the evaluation stopped. A survey took place in April-May 2008 and administrative data was collected for 2008-2009 school year. This paper thus documents the short-term dynamics of an anticipated long-term program

We find an overall positive impact of the grant program on parents' contributions and participation in all schools: communities which were given the grant engaged in more nonassertive participation actions (such as contributing money) and also more assertive actions (such as going to meetings and managing school supplies). We find that in situations where the community has

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more authority, they make more contributions. In addition, we find that it is only in schools where the community has relatively high authority that school committees took charge of monitoring teacher attendance or sanctioning teachers for absenteeism in response to the grant. Communities with low authority did not do this at all.

We also observe a small significant decrease in teacher effort in response to the grant, which we attribute to the fact that some teachers have a preference for a centralized government and might be reluctant to collaborate with parents. At the same time, we find that the infrastructure quality (measured by an index) improved in treatment schools. Finally, we observe an increase in the demand for education for young pupils. We argue that this supports the idea that increasing parental participation in school management motivates enrollment, and we provide evidence that some part of the increased enrollment is due to the practice of participation, rather than to infrastructure improvements.

There are four key policy implications of our findings. First, the degree to which outside inputs are treated as complements, rather than substitutes, to a community's own contributions and efforts may depend on the degree to which the community has power over the inputs. Second, parent participation can reduce teacher effort, and some attention should be given to designing programs with this possible response in mind. Third, programs that encourage communities to take responsibility for monitoring service providers should take into account whether this is actually feasible given the power relationships between the community and the service providers. Finally, the practice of participation can itself be a mechanism to increase service uptake. Our paper is situated at the intersection of a two strains of literature: the behavioral response of parents and teachers to educational policies, and the impact of beneficiary participation on public service quality.

The remainder of the paper is as follows. Section 2 presents some background information on education in Niger, and describes the school grant experiment. Section 3 presents the data and our estimation strategy and Section 4 the empirical results. Section 5 presents a model of the dynamics of school resources, parent and teacher effort in producing education that explains the existing empirical evidence. Section 6 concludes.

2 Experimental Set-Up

2.1 Background on Education in Niger

Niger had made remarkable progress in education access in the decade prior to this evaluation: the number of children enrolled in primary school had more than doubled from 656,000 in 2000 to 1,554,102 in 2008, and net enrollment had risen from 27% to 49% in the same period. However, only 44% of children who begin primary school finished all grades, and only 43% of sixth graders who took the national exam at the end of primary school passed it.[3] Literacy rates are low, and education may be able to substantially improve livelihoods: the World Bank estimates that being able to read raises a Nigerien person's income by 150% (World Bank, 2010).

In 2006 the Ministry of Education in Niger introduced school committees in all primary public schools in order to improve quality. These school committees (called the COGES) were designed to implicate parents and community members in the school, improve accountability, improve management, and thus enhance access to and quality of education.[4] As discussed in the introduction, the establishment of local community groups for the purpose of improving public service provision via community participation is a strategy that many country governments and civil society organizations advocate. In many respects, the circumstances of Niger make a strong case for school-based management: low population density, vast distances and limited transportation and information and communications infrastructure makes supervision of primary schools by the central government (or its regional structures) very costly, and the transmission of timely, local information to the central authorities for planning purposes is challenging.

In the districts where this program was carried out, the COGES were trained in financial management, governance (elections) and project planning - though the training was carried out by multiple organizations and due to COGES turnover, not all members had been trained. In 2006, a significant number of the newly created and trained school committees were not very actively engaged in school matters, nor did they develop an school improvement plan for the school year.

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[3]The situation has continued to improve in terms of access to education: in 2011, net enrollment in primary school was 62%, and primary completion rates had risen to 46%.

[4]These school committees consist of 6 representatives, including the school director, who serves as secretary, and parent representatives. The parents are supposed to elect the representatives, who may also be the leaders of the Parent Association (APE), which includes all parents, and the Mother's Association (AME), which includes all mothers. In practice, the composition of the COGES varies by school. School committees are supposed to be responsible for the management of personnel resources (e.g. monitoring of teacher attendance and performance), financial resources (e.g. school meal funds) and material resources (e.g. purchase and management of textbooks, supplies etc.). One of the school committee's central tasks is the drafting of an annual school improvement plan that includes its projects, activities, budget, and timelines to guide its work for the school year. The school committee works parallel to the APE and AME.

To spur school committee involvement and activity, the Ministry of Education introduced school grants in order to give the committees an incentive to meet, plan and undertake activities. The grants were expected to improve school management through increased parental participation and accountability, to improve school infrastructure and the quality of education, and to potentially increase enrollment rates. The pilot project was carried out as a randomized evaluation in order to provide reliable information on impact prior to national scale-up.

2.2 Experimental Design

The evaluation design included 1,000 randomly selected schools in two regions of Niger, Tahoua and Zinder. One-thousand schools were randomly selected out of the 2,609 total public primary schools in Zinder and Tahoua. Once these 1,000 schools were determined to be representative of all the public primary schools in Zinder and Tahoua, half of the 1,000 schools, i.e. 500 schools, were randomly assigned to receive the grants and became the treatment group. Both randomizations were stratified on inspection (a geographical administrative unit), existing support for the school committee (e.g. from NGOs), and urban versus rural location. The other 500 schools served as a control group. Data from the Administrative School Census in 2005-2006 (the school census is described below) was used to confirm balance between control and treatment schools along various observable characteristics (data from 2006-2007 was not yet available at the time of sampling in August 2007). Table 1 shows p-values for the test of equality of means across control and treatment, from which we cannot reject any equality of means.

The size of the grant was based on the size of the school (the number of classrooms), and the average was $209 per school, or $1.83 per student. On average, the control schools raised a little over $0.60 per year per student, and so the grant is relatively much larger. For an idea of scale, the amount of the grant was not, except in the very largest schools, sufficient to build an additional classroom.[5]

About a month before the grant arrived, all 500 treatment schools (and school committees) received a general letter informing them of the grant program and its objectives, and the grant amount allocated to their school. It also included general guidelines on the use of the grants, but

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[5]The school committees selected for treatment received the grants in the last months of 2007 and first months of 2008. The grant was a relatively modest amount that was determined by considerations of financial sustainability in view of a potential extension of the program by the government. Note that schools do not, in general, receive other financial transfers from the government. The government does provide material in kind, such as books and classrooms, and teacher salaries are paid by the government (though payment has been irregular in the past). Some schools receive support from other community organizations or NGOs, but in general the amount of cash income available to schools is very small and is obtained through parental contributions.

the specific activity to be supported by the grants was decided on by the school committee.[6] One copy of this letter was distributed to the school director and a second copy to the president of the school committee before the arrival of the grants. As to compliance and program execution, the grants arrived in 498 schools of the 500 program schools, 492 in the exact amount allocated to them and six in an different amount (see Appendix 3 for further details on compliance).

The school committees used the grants in a variety of ways. Eighty-five schools were randomly selected for a detailed questionnaire on grand arrival and spending. The most common use was material inputs such as construction and office supplies, and other uses included investment projects, health and sanitation projects, and transportation. Overall, the largest share of spending of the grant was in construction. Construction activities included building classrooms, but communities also constructed lodging for teachers, latrines, school enclosures, and other buildings. Other projects including electrification or producing copies of exams were also undertaken. Fourteen percent of schools surveyed, used at least part of the grant to make loans either to parents, the director, or to the AME at some interest rate, or purchasing grain for re-sale. It is unclear whether the loans or small business projects have been profitable.

The program was originally intended to last three years (with three cycles of grant disbursement). Due to issues with the financial transfer mechanism at the central level and the political coup that happened in 2009, the evaluation was terminated after only one year.

3 Data and Empirical Strategy

3.1 Data

3.1.1 Sources

Data come from two sources: (i) administrative data on primary schools (the Ministry of Education's annual school census, also called administrative data) and (ii) an evaluation survey administered to school staff and two members of the school committee at treatment and control schools. The Ministry of Education in Niger administers an annual census of all primary schools, including community schools and medersas (Koranic schools), which provide data on enrollment, teacher characteristics, school facilities and resources, and community characteristics. In addition to the administrative data, the Ministry and the World Bank worked with a local NGO to prepare a detailed school survey

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[6]One randomly selected group of schools received a slightly more restrictive list of potential expenditures, and another group received a warning that their projects might be audited. Analysis of spending patterns did not show any difference between these groups.

to be administered in April/May 2008, five to six months after grant distribution, to understand the immediate effects of the grant. This questionnaire included information on school infrastructure and resources, pupil enrollment and attendance, school improvement plan, school committee functioning and membership, and school activities. It also asked detailed questions about the level of education and personal wealth of the school committee members.

3.1.2 Outcomes

To draw general conclusions about the experiment's impact, simplify interpretation, and to guard against cherry-picking of results, we present findings for indices that aggregate information over multiple outcome variables (following Kling et al, 2007). The aggregation also improves statistical power to detect effects that go in the same direction within a domain. Appendix 4 gives details the methodology and the composition of the indices used in this paper. Descriptive statistics on parent actions, infrastructure, and teacher presence in control schools are presented in Table 5 and 6 and discussed in Appendix 3.

We divide parent participation actions into three types: nonassertive, assertive, and oppositional, because we think that the parents' real authority might have affect these actions differently.

Nonassertive Parent Actions   Nonassertive actions are those which involve the parents either contributing to the school or executing school policy - that is, they do not require parents to exercise much authority in decision-making. We use four variables to measure nonassertive actions: financial contributions, a dummy for whether in kind contributions were made[7], a dummy for whether the school committee is in charge of monitoring pupil attendance, and a dummy for whether the school committee is in charge of sanctioning pupils for poor attendance.

Assertive Parent Actions   Assertive actions are those which require the parents to take some responsibility for and exercise authority in making decisions. We use seven variables to measure assertive actions: the time elapsed since the last parent and school committee meetings, whether the mother's association was active or not, and whether the school committee is in charge of collecting fees, spending fees, supplies and infrastructure.

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[7]It is not feasible to evaluate the amount of in kind contributions as we do not have information on the local market price of the items contributed.

Oppositional Parent Actions Oppositional actions are those that require parents not only to take responsibility for decision-making but also require them to act in opposition to the teachers (if necessary). We use two variables to measure this (as there are only two, we do not create an index): a dummy variable for whether the school committee supervises teacher presence, and a dummy variable for whether the school committee imposes sanctions if teachers are frequently absent.

Infrastructure The data on infrastructure comes from the 2008/2009 annual administrative database. We create an index of infrastructure quality using data on the number of buildings, blackboards, latrines, and books, a dummy for access to water, and a dummy for school enclosure (this is a fence or wall around the school grounds that separates the school from other public space).

Teacher Presence The unannounced school visit in 2008 recorded how many teachers were present on the day of the visit, and how many teachers are employed at the school. We use a simple percentage of the number of teachers who were physically present at the school.[8]

Demand for Education We have two data points for demand for education. We use the number of dropouts reported by the school to our surveyors at the April/May 2008 questionnaire, and the change in enrollment from fall 2007 to fall 2008 reported to the Ministry of Education.

3.1.3 Interaction Variables

The sample size was chosen to be large enough to allow for testing for heterogeneous treatment effects along community characteristics, one of the initial objectives with this the study. Parents vary in their capacity to manage school resources wisely and influence school decisions. This capacity depends on their power vis-à-vis teachers, or "real authority" in the terms of Aghion and Tirole (1997), who underscore the fact that formal authority -the right to make decisions- needs not imply real authority -effective control over decisions. We test whether real authority is an important predictor of how effective the increase in school resources under parental control is. The characteristics that we use in our empirical framework to capture differences in real authority are the following:

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[8]Excused absences were counted as absences. If the school was closed on the day of the visit (which was always on a day that the school was supposed to be open), but data was available on the number of teachers employed there, all teachers were counted as absent.

- Education: Education is an important determinant of social status, and may be particularly so in contexts where the average education levels are low and teachers tend to be respected members of the community. We define a community as "educated" if one or both of the two interviewed members of the school committee completed primary school (excluding the director)[9]

- Wealth: We assume that the wealthier a community is, the more real authority parents will have because they will have a higher social status relative to the teachers (note that teachers are relatively homogenous in terms of wealth). The wealth of school committee members is the first component of a principal component analysis of durable goods possessed by the two interviewed school committee members and the school director. Durable goods include means of transportation, animals and housing equipment. The wealth of school committee is then the average of this wealth index for the two interviewed school committee members.

- Teacher Status: In Niger, teachers are either civil servants or contract teachers. Both are hired and paid by the government (either central or regional) rather than the school. Contract teachers are generally paid less than civil servants, and the government is able to fire contract teachers more easily than civil servants. If parents are unsatisfied with teacher performance, they can complain to the district level government, who can then take action against the teacher more easily if the teacher is a contract teacher than a civil servant. Schools with a high proportion of civil servant teachers should then have parents with lower real authority. We measure teacher status by measuring the percent of teachers in a school who are civil servants. (In Niger about 80% of teachers are contract teachers, and many schools have no civil servants, including the director).

- The seniority of the school director: We assume that a brand new school director (one who has recently arrived in a school, regardless of previous posts) is likely to have less power relative to the community than a school director who has been assigned to (and living in) the community for many years. The seniority of school director is the number of years that the school director has been in charge at this specific school.

- Common language: We assume that if a school director comes from the same ethno-linguistic

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[9]When information for one of the members is missing, we impute the value of the member for whom information is available, in order to avoid dropping observations. Results do not vary substantially when these schools are excluded but the sample size is reduced.

group, he or she is more likely listen to parents and facilitate their participation, and so the parents will have more authority. We measure common language as a dummy variable, equal to 1 if the director and the community share a language.

- Authority Factor: The interaction variables are thought to be different kinds of measures of the same underlying trait of latent factor (authority). We attempt to measure this trait by using a simple principal component analysis with the above variables and predicting the first component.

Summary statistics on these community characteristics are presented in Table 2 and discussed in Appendix 3.

3.1.4 Attrition

There is some attrition in the datasets. Each year, a handful of schools do not return the administrative data questionnaire or the questionnaires are improperly filled out, leading to missing data for 3% of the schools for the infrastructure index and 1.4% of the schools for 2008/09 enrollment. The April/May 2008 survey was conducted on the basis of unannounced visits, which meant that many schools were closed. In addition, some schools were not visited due to security concerns, and still others closed early that year because the summer rainy season began early and so many children went to the fields with their parents to plant. As a result, data from the evaluation questionnaire is available for only 814 schools (81.4%).

We test for differences by treatment group in the proportion of schools with missing outcome variables as a whole and sub-divided by district, urban and rural, and whether the school had external support (for example, NGO sponsorship) prior to the project. Results are reported in Table 3. 56 t-tests on treatment and interaction between treatment and sub-groups yield two statistically significant differences (at the 10% level or higher), which is well within the amount that would be expected with random attrition. The comparability between treatment and control groups is thus intact. As to external validity, there are more schools missing in the region where security was a concern (Tahoua, in the north). In general, larger schools are 5 to 7 percentage points less likely to be missing data.

3.2 Empirical Strategy

Local Average Treatment Effect We estimate intent-to-treat effects as measured by the differences in the means of school outcomes between schools initially assigned to the treatment group and schools initially assigned to the control group. Let T be an indicator for treatment group assignment and let X be a matrix of stratification variables. Estimation of the intent-to-treat effect β is from the following equation:

$$Y_j = \beta T_j + X_j \gamma + \varepsilon_j \tag{1}$$

where Y_j is the outcome of school j. The covariates (X) are included to improve estimation precision and include whether the school is urban, the total proportion of girls in 2007/08, the total enrollment in 2007/08, whether the school was supported by an outside NGO in 2006/07, and the inspection (a geographic/administrative unit). All regressions use robust standard errors.[10] The absolute magnitudes of the outcomes are in units of outcome's standard deviation, so the estimate shows the treatment effect in terms of standard deviation units over the control group.

Heterogeneous Treatment Effects Along Community Characteristics In the second step, we estimate intent-to-treat effects with an interaction term to determine whether the average treatment effect on parent and teacher behavior varies with real authority. We run regressions of the form:

$$Y_j = \beta T_j + \theta(C_j T_j) + \sigma C_j + X_j \gamma + \varepsilon_j \tag{2}$$

where C_j denotes a proxy of parents' real authority. In this case θ is the additional (or reduction of) impact for schools with characteristic C_j. We include an indicator for urban schools and the interaction of this indicator with the treatment assignment for each characteristic whose correlation with being located in an urban area is above 0.1, to disentangle the effect of this characteristic from the effect of being located in an urban area.

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[10]An alternative specification uses dummies for the strats used in random selection, which were defined using a dummy for urban, the total enrollment in 2005/06, and support by an outside NGO in 2005/06. This specification does not substantially change the results, but increases precision of some coefficient estimates and decreases precision of others.

Identifying Channels of Impact   We generate evidence on channels of impact on demand for education by including the potential channel in the regression of treatment on the outcome, and observing the change in the coefficient on treatment. We estimate the following equation:

$$Y_j = \beta_2 T_j + \phi C_j + X_j \gamma + \varepsilon_j \tag{3}$$

where C_j is the channel variable, and compare β_2 to β generated by equation (5). A reduction in the point value for β when the channel variable is included is evidence that some of the variation in Y_j which was due to variation in T_j is accounted for by the variation in C_j. Put differently, a reduction in the coefficient on treatment when the channel variable is added is consistent with the hypothesis that some of the impact flows through that channel.

The interpretation of the information derived from this tests is limited by the caveat we cannot be sure that there is not another unmeasured channel which is correlated both to a measured channel and to the outcome. However, this test provides suggestive evidence of the mechanism of impact.

4   Results

4.1   Effect of Grants on Parent Participation in Monitoring Schools

We find evidence that school committee grants increase parent participation in schools and that this increase consistently varies with parents' real authority (although some estimates are imprecise).

Nonassertive Actions   Table 7 shows the impact of grants on nonassertive actions. The overall effect of grants is that parents increased their involvement in the school in nonassertive activities. The mean of the treatment group is 0.14 standard deviations above the mean of the control group for the index of supportive actions, significant at the 1% level. The analysis of the component variables (funds collected per pupil, in kind donations, pupil attendance supervision and sanction) show that most of this overall effect comes from an increase in parental contributions to schools[11], which is 0.48 standard deviations higher in the treatment group than in the control group. This represents an average increase in parental contributions of $0.50 per pupil for a grant of $1.83 per pupil, which means that parents supplemented 27% of the grant value. This result contrasts with

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[11] Table A1 gives the impact of the program for the components of the index.

previous studies showing that parents decreased their contributions in response to an increase in school resources (Das et al., 2010; Pop-Eleches and Urquiola, 2012)[12] .

The impact is significantly larger when the school committee members are more educated: the interaction term between education and treatment is 0.07, significant at the 10% level, meaning that educated parents supplemented more the grant than non-educated parents.

Assertive actions   The impact of grants on assertive actions is reported in Table 8. The overall effect of grants is positive: the mean index of the treatment group is about 0.08 standard deviations above the mean of the control group. The analysis of detailed variables composing the index shows a 27% increase in the proportion of school committees in charge of collecting fees (from 30% to 38%), or a 18% increase in the proportion of mothers' associations with active status[13] (from 27% to 32%). We also observe a five percent increase in the frequency of parental association and school committee meetings and on the responsibility of infrastructure.[14]   None of these effects on the index components are statistically significant (although some of them are very close to conventional significance), while the effect on the index itself is significant at the 1% level.

The average treatment effect does not vary significantly with community characteristics.

Oppositional Actions   There is no overall impact on teacher supervision or sanction for teacher absence (Tables 9 and 10).   However, consistent with the model, only communities where the school committees were educated increased their supervision of teacher attendance (Table 8), and only communities with a higher Authority Factor increased their sanctioning for teacher absence. Educated school committees are 4 percentage points more likely to supervise teacher presence if the school was treated (77% in the control group versus 81% in the treatment group, or 0.13 standard deviations), significant at the 10% level. The coefficient on the interaction between authority and treatment on sanctioning teachers for absenteeism is positive (6 percentage points) and significant at the 10% level.

We consider this empirical test as a first attempt to formally take into account real authority and the results as suggestive enough to encourage further tests on more heterogenous samples. Our

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[12]An alternative interpretation would be that this result derives from the fact that we measure only the first year of the grant, and so parents did not have time to change their own contribution of inputs (see Das et al, 2011, where crowding out was greater when a school grant was anticipated than when it was unanticipated). We think this is unlikely since the parents did respond by changing their contribution to the school, and they responded by increasing their contributions to support school projects. In addition, parents were notified in advance of the grants arrival.

[13]This data comes from a question on the annual administrative survey where schools are asked to indicate whether the mothers' association is active or not.

[14]Table A2 gives the impact of the program for components of the index.

finding that the impact of the school committee grant program varies with parents' real authority echoes other existing results in the literature: Duflo, Dupas and Kremer (2012) find that giving parents the responsibility over an extra-teacher led to a reduction in effort from civil-service teachers and, crucially, that a training to empower the parents helped mitigate this reduction. In Gambia, Blimpo and Evans (2011) studied a training for school committees in school management, combined with a grant to initiate activities. This project increased parent participation and pupil attendance, and decreased teacher absenteeism, but had no impact on learning except when the school committee members were educated. Pradhan et al. (2011) report on a field experiment in Indonesia using also the combination of a training and a grant to encourage school committees to participate in school management. This policy increased parent participation and learning only when combined with an intervention fostering the ties between the school committee and a local governing body. Gunnarsson et al (2009) use data from eight Latin American countries to show that parent effort (as well as principal effort and material infrastructure) is more related to parents' human capital and the size and remoteness of individual communities, as opposed to the de jure policies implemented by the different country governments. Studying four case studies of parent empowerment through School Site Councils in the United States, Gershberg and Shatkin (2007) give suggestive evidence that a condition for parent empowerment to improve school quality, school-community relations and community organizational capacity is that the institutional context gives parents enough real authority. Communities may lack the necessary capacity to effectively plan or monitor teachers, and so decentralization of school management may increase inequality by primarily benefiting the better off and leaving the poor behind (Galiani et al, 2008). As King and Ozler (2004) demonstrate, policies of *de jure* autonomy do not always lead to *de facto* autonomy, and so participation may not be meaningful if communities have no actual power.

4.2 Effects of Grants on School Infrastructure

As shown in Table 11, we find that in the slightly longer term (one year after the treatment) there is a small improvement in the infrastructure index of schools: a 0.04 standard deviation increase in the index for infrastructure quality. This is largely driven by increases in the number of classrooms and the construction of walls around the compound.[15] The increase in the number of new classrooms amounts to 0.12 of a standard deviation, representing an additional 0.09 new classrooms per school

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[15]These items were projects that were frequently reported by the schools as projects undertaken using the grant money.

in the treatment group over 0.23 new classrooms per school in the control group (a 39% increase). The increase in the proportion of schools with walls around the compound (enclosure) amounts to 0.18 of a standard deviation, with 9 percentage points more in the treatment group over 34% in the control group (a 26% increase). We should recall that we have found that the grant was supplemented by parents in terms of financial contributions and in-kind help, so the increase in the material quality derives from both the increased financial parent contributions and the grant itself.

4.3 Effects of Grants on Teacher Presence

We find a decrease in teacher presence in the treatment group: around 4 percentage points on an average of 76% presence in the control group, significant at the 10% level (Table 12). The interaction terms do not reveal any meaningful heterogeneity. Teachers thus responded to increased resources under the control of parents with a reduction in their own inputs. Feedback from the field revealed that those teachers with a centralized view of government were resentful, while those who had worked with communities were open to the idea. This finding echoes the result found by Duflo, Dupas and Kremer (2012) in Kenya where giving parents the responsibility over an extra-teacher led to a reduction in effort from civil-service teachers. All in all, it is interesting that additional resources under parental control increased parents' effort but decreased teachers' effort, whereas Das et al. (2010) and Pop-Eleches and Urquiola (2012) find that additional resources out of parental control decreased parent's effort (they do not observe the effect on teachers' effort). The model we propose in section 5 will make all these results consistent.

4.4 Effects of Grants on Demand for Education

The grant program increased demand for education for children in the first and second year of primary school. Table 13 reports on pupil dropouts and Table 14 reports the impact of grants on pupil enrollment in 2008/09. Younger pupils exhibit fewer dropouts at the end of 2007-2008 for pupils in Grade 1: the dropout rate for grade 1 was 1 percentage point lower in treatment schools (2% versus 3%), significant at the 10% level. These findings are supported by higher enrollment the next year, in 2008-2009, in Grade 2. There were slightly more than 3 additional pupils in grade 2, up from a control group average of 30 pupils, significant at the 5% level. The grant thus increased school participation for the youngest pupils.

The fact that the demand increases for youngest pupils suggests that the demand for education

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is more elastic when the child is young, which is consistent with the two classical ideas that the benefit of enrollment is lower when the child is older, and that the cost of education increases when the child gets older, especially because of opportunity cost of time of elder children. It is therefore not surprising to observe a higher elasticity of demand for educating young children than for educating elder children.[16]

4.5 Channels of Impact on Demand

Table 15 reports the test for channels of the impact on demand, with three channels which showed significant overall treatment impacts: nonassertive action, assertive action, and infrastructure quality. The outcome is the number of pupils enrolled in second grade in the fall of 2008/2009. We avoid confounding a decrease in the coefficient on treatment by comparing the coefficient of the regression with the channel to the coefficient of the regression without the channel but restricted to the sample that has data for the respective channel.

Adding the index of nonassertive action reduces the coefficient on treatment by 20% (column 3), adding the index of assertive action reduces the coefficient on treatment by 10% (column 5), and adding the index of infrastructure reduces the coefficient on treatment by 4%. The highest reduction in the coefficient on treatment comes when both the index of contribution and the index of management are included (28%). Including the index of infrastructure never reduces the coefficient on treatment by more than 3%.

These results suggest that some of the increase in demand is flowing from the increase in parental participation in school activities and not from the increase in material quality.[17] This effect could be due to an informational effect (better informed parents get a larger benefit of enrolling their child) or a psychological effect of participating (involved parents have less problems with procrastination and are more pro-active). Policies to foster parent participation might thus help advance two different goals: improving the quality of schools and increasing demand for education.

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[16]We also take the fact that only younger grades were impacted as evidence that the change in enrollment is not due to intentional misreporting by grant schools. In addition, the finding is replicated across two different types of data collections and at two different periods.

[17]While we are confident that the impact flows through the channel of increased parent participation, we cannot exclude the possibility that the channel for increased demand is not related to some quality measure which is changed by parent participation and which we do not measure (for example, perhaps parents demanded that teachers stop using corporal punishment, which we do not measure).

5 Model

In this section, we consider a model that formalizes the behavioral responses of parents and teachers to a change in school resources and the resulting effect on school quality. The motivation for this model is two-fold. First, the model helps to clarify how the grant program studied in this paper can affect parent participation, teacher effort and school quality. Second, we want to show that reasonable assumptions on school dynamics are able to produce predictions consistent with the evidence found in the literature.

Albornoz et al (2011) model the interaction between student, parent and teacher investments and school resources, to explain the ambiguous effect of resources on parent involvement at home. This model suggests that under some circumstances, an increase in school resources generate a decline in parent investment in education at home. Das and al (2011) also provide a model to explain the decrease in parental effort at home in response to an increase in school resources. But none of these theoretical frameworks take into account parental participation in school. The model proposed in this paper enriches our understanding of school dynamics by taking into account parents' effort both at home and at school, which enlarges the set of interventions of interest and adds to our understanding of the effects of educational policies.

5.1 Set-Up

The model involves three participants: parents, teachers and the government. Teachers decide how much time they put in teaching t_t. Parents decide how much time they invest for education at home t_h, as well as how much time they participate in school management t_p. Finally, the government chooses the level of governmental resources for the school, which decompose in two parts, $G_t + G_p$, where G_t is resources in the hands of school staff (principals and teachers), while G_p is governmental resources for the school under the control of parents (typically, resources handled by the school committee).

Here, "participation" in school management refers to the many different kinds of participation that policy makers envision, where beneficiaries might be organized into committees, undertake projects themselves, such as construction or sanitation, raise funds, provide personal contributions, supervise, hire, and even fire teachers, engage in awareness campaigns, provide advice to staff, and so on. Participation is expressed in time units (financial participation is converted in time through hourly wage).

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Children's Learning

Children's learning E is the addition of learning produced at home and learning produced at school.

Learning produced at home   Learning produced at home is assumed proportional to the number of hours parents devote to education at home, t_h (making sure kids get up on time and go to school or investing in private lessons, for instance). How much each hour spent on education translates into learning depends on parent's productivity at producing learning, denoted e, reflecting for instance parents' level of education (more educated parents produce more learning for each hour spent on helping with homework) or parents' hourly wage (a higher wage can pay for a higher amount of private lessons for each working hour invested in education). Learning produced at home is thus et_h.

Learning produced at school   Learning produced at school is proportional to the time teachers spend at school, t_t. How much each hour spent at school translates into learning depends on teachers' productivity, which results from school resources. Indeed, school resources encompass salaries (which should reflect both class size and teachers' quality) and school materials (infrastructure, textbooks, flip charts, blackboard, etc.) that allow teachers for producing more learning for the same amount of time spent with the children. So we assume that the level of resources is a factor of teachers' productivity.

Furthermore, we assume that parents' participation in school management interfere with school resources in the determination of teachers' productivity. Indeed, parents' participation is additional resources: parents raise funds from the community, and do administrative tasks that allow teachers for focusing on teaching and producing more learning for the same amount of time spent at school. Moreover, parents' participation should increase the allocative efficiency of school resources by preventing rent capture and making expenses closer to educational needs and common interest (Barrera-Osorio et al, 2009). We thus assume that parents' time spent on school management, t_s, is a factor that increase the effect of resources on teachers' productivity. This factor apply to resources under parental control, G_p, but not on G_t in which parents do not have a say.

We thus assume that learning produced at school is given by $(G_t + t_p G_p)t_t$ and total learning is given by $E = et_h + (G_t + t_p G_p)t_t$.

Parents' Utility

Parents' utility is the difference between the benefit they derive from children' learning E, and the opportunity cost of the time they spend on producing learning, $t_h + t_p$. The benefit from children' learning is assumed concave in E (for instance $ln(1 + E)$), so that learning produced at home and learning produced at school are technical substitute. The cost of time is assumed linear (for instance $t_h + t_p$), so parents' utility is given by:

$$U_p = ln(1 + et_h + (G_t + t_pG_p)t_t) - t_h - t_p \qquad (4)$$

Teachers' Utility

Similarly, teachers' utility is the difference between the benefit they derive from children' learning and the opportunity cost of their time. We assume that teachers' benefit and cost take the same form as parents' ones, except that their welfare is also influenced by parents' participation in school management: teachers derive a benefit from parents' satisfaction towards their production of learning when parents can observe this production. This benefit takes the form of a social reward[18] that is proportional to the time teachers devote to school, with a factor of parents' participation: the more parents participate, the more they observe and reward each unit of time teachers devote to education.

However, teachers who have a preference for a centralized government might resent being monitored by parents because of the resulting loss of autonomy and leadership in school decisions. In this case, the effect of parents' participation on teachers' welfare can be negative, teachers' loss of welfare being also proportional to the time they devote to education, with a factor of parents' participation (the more devoted they are and the more parents participate, the more teachers are resentful). We denote δ teachers' taste for community participation in school management. A negative δ reflects a preference for a centralized government, whereas a positive δ reflects openness to collaborate with parents (a δ close to zero would reflect teachers' indifference).

As a result, teachers' utility is given by:

$$U_t = ln(1 + et_h + (G_t + t_pG_p)t_t) - t_t + \delta t_pt_t \qquad (5)$$

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[18] An equivalent way to put it is that teachers incur a social sanction from the community if they shirk and if parents can observe it.

5.2 Parents' and Teachers' Choices

The first-order condition for the teachers' problem is sufficient (U_t is infinitively differentiable and $U_t''(t_t) < 0$) and gives the optimal choice of teachers:

$$t_t = max \left\{ \frac{1}{1 - \delta t_p} - \frac{et_h + 1}{G_t + t_p G_p}, 0 \right\} \tag{6}$$

For the parents, the first-order conditions are also sufficient and give the optimal choices:

$$t_h = max \left\{ 1 - \frac{1 + (G_t + t_p G_p)t_t}{e}, 0 \right\} \tag{7}$$

$$t_p = max \left\{ 1 - \frac{G_t}{G_p} - \frac{et_h + 1}{t_t G_p}, 0 \right\} \tag{8}$$

From the expression of t_p, we see that parents invest more time in school management when resources under their control increase and when teachers make more effort. In contrast, parents invest less time in school management when resources in the hands of teachers increase, when they spend more time for education at home and when their efficiency with education at home increase.

Symmetrically, parents devote more effort for education at home when their efficiency at home increases, whereas they reduce effort at home when school resources increase, or when teachers' or their own effort at school increase.

Finally, teachers increase time they spend at school when school resources increase, whereas they reduce it when parents' effort or efficiency at home increase. However, the response of teachers to an increase in parents' participation in school management is ambiguous: if δ is positive, the response is clearly positive too: teachers spend more time at school. But in the region where δ is negative, for large absolute value of δ, the response is negative, meaning that teachers who have a strong preference for a centralized government reduce time at school when parents' participation in school management increases.

5.3 Heterogenous Best-Responses

For the best clarity and simplicity, the model above just includes the main dynamics in the school system. In this paper, we also explore the possibility that power imbalances are likely to induce different choices. This section explicit how parental real authority influences parents' and teachers' decision.

In our model, real authority of parents over the school would be captured by a parameter θ multiplying parents' time spent in school management: learning produced at school is given by $(G_t + \theta t_p G_p)t_t$, reflecting the fact that more powerful parents make better use of resources under their control, therefore extracting more learning from teachers for each hour invested in school than weak parents. Also, it should be noticed that real authority of parents θ is unlikely to be orthogonal to teachers' preference for a centralized government δ. On the one hand, teachers are more likely to resent being monitored by parents when teachers enjoy a high social status relative to parents, for instance when parents have a low if not no education, which is likely to coincide with parents' lack of real authority. On the other hand, teachers' preference for a centralized government largely determines the extent to which parents entitled to participate in school (have *formal* authority) are involved in decision making (have *real* authority). We thus posit that $\delta = \delta(\theta)$ with $\delta' > 0$. The best-responses with a parameter θ reflecting real authority are: $t_h = max\left\{1 - \frac{1+(G_t+\theta t_p G_p)t_t}{e}, 0\right\}$, $t_p = max\left\{1 - \frac{G_t}{\theta G_p} - \frac{e t_h +1}{\theta t_t G_p}, 0\right\}$ and $t_t = max\left\{\frac{1}{1-\delta(\theta)t_p} - \frac{e t_h +1}{G_t+\theta t_p G_p}, 0\right\}$.

Effect of real authority on parents' and teachers' decisions Since their participation at school is more productive, parents with higher θ invest more time in school management and less time at home than parents with low θ. Teachers also invest more time at school because their productivity is fostered by parents' real authority. Moreover, the likelihood of δ being negative is lower when parents' real authority is larger, which adds to the general positive effect of parents' real authority on teachers' effort.

Effect of real authority on parents' and teachers' responses Parents' response to an increase in teachers' effort or in resources under their control is amplified by real authority, just as teachers' response to an increase in resources under parental control. Moreover, teachers' response to an increase in parent's participation in school management is reduced in the negative region and amplified in the positive region by real authority. These predictions are consistent with the evidence presented in section 4.1 that the benefits of community-based interventions are larger when parents are more powerful.

5.4   The Effect of an Increase in School Resources

In the light of this model, what is the effect of an increase in governmental resources to schools? In the short run, parents won't take into account the fact that teachers will also react to the

changing conditions (and reciprocally). We thus consider that parents take the teachers' actions as given (fixed for instance at their past value) and *vice-versa*, and we determine the comparative statics and discuss the predicted behavioral trajectories. Our interest for short term responses is because most empirical framework in the literature provides short-term responses and that real-life behavioral adjustments seem slow. Pop-Eleches and Urquiola (2012) show that responses after one year are different from responses in the longer run, reflecting the fact that it takes quite a long time for parents to adjust their behavior to others' actions.[19]

Effect in the absence of parents' participation in school

In the short run, an increase in school resources increase teachers' time at school and decrease parents' time for education at home. The fact that parents devote less time for education at home tends to reinforce teachers' response, which comfort parents with investing less time at home, etc. The long-term effect of an increase in school resources is thus clear-cut: teachers respond positively while parents respond negatively. The final impact on school quality is a mixed bag: the increase in school resources and teachers' response tend to improve education outcomes, while parents' response tend to reduce this effect. Pop-Eleches and Urquiola (forthcoming) and Das et al. (2010) confirm that an increase in school resources reduced parents' effort (they do not observe teachers' response). In our framework, this policy is appropriate in contexts where (i) teachers actually use resources for educational purpose, and (ii) the effect of additional resources on teachers' productivity is large. The conditions of success of this policy are thus a sound institutional environment preventing rent capture and an initial level of school resources at which marginal gains of productivity are steep[20].

Effect in contexts where parents participate in school

Teachers' and parents' responses to an increase in school resources are the same as above, but now parents' re-optimize their level of participation in school management too.

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[19]There are multiple reasons for long run adjustment. For instance, parents may not realize that teachers incur a loss of welfare from collaborating with them (formally, they have a imperfect perception of teachers' δ) because teachers do not disclose their reluctance to collaborate with parents in front of them (because it would be rude). It is also possible that parents do not take into account what they observe in the short run because they expect continuous collaboration to make δ become positive in the future.

[20]This analysis would benefit from evidence on the shape of teachers' productivity as a function of school resources to know which kind of regions would experience the larger gains in teachers' productivity. If this function is concave (resp. convex, S-shaped), gains in teachers' productivity are larger at the bottom (resp. top, middle) part of school resource distribution.

Increase in G_t   If the additional resources fall in the hands of teachers, parents *decrease* their participation at school. This in turn affects teachers' effort in a way which depends on teachers' preference for a centralized government: if teachers prefer a centralized government, the decrease in parents' participation in school management amplifies teachers' positive response to the increase in school resources, so teachers make unambiguously more effort. In contrast, if teachers are motivated by the collaboration with parents, the decrease in parents' participation reduces their incentive to work hard and the policy brings a smaller benefit. The conditions of success of this policy are thus (i), (ii), plus the condition that (iii) teachers prefer a centralized government. France is an example of countries where this policy is likely to work well.

Increase in G_p   If the additional resources fall in the hands of parents, parents *increase* their participation at school, which leads to the opposite situation in which teachers invest unambiguously more effort when teachers are motivated by the collaboration with parents through three positive effects: the effects of additional resources and of parents' participation in the management of the resources on their productivity, and the incentive produced by the social reward. When teachers prefer a centralized government, parents' participation creates a burden for teachers which reduces teachers' effort in a way that might be strong enough to offset teachers' positive response to school resources and to parents' management of the resources. In the long-run, this should eventually discourage parents to participate at school and encourage investment for education at home back up, but in the short-run concurrent increase in parents' participation in school management and decrease in teachers' effort can be observed, as Duflo, Dupas and Kremer (2012) find in Kenya. Our empirical results are also consistent with the situation where teachers' preference for a centralized government is strong and parents' real authority is weak, resulting in a negative short-term impact of parents' participation in school on teachers' effort. The impact on school quality can be at risk since the positive effects of school resources and parents' management of the resources are mitigated by a double decrease in parents' effort at home and teachers' effort at school.

When parents have a large real authority θ, the positive effect of parents' management of the resources is larger so parents' response is larger too, which is consistent with our empirical findings that parents contribute more and participate more in school management when they have more authority. The larger effect on parents' participation combined with the smaller likelihood of a preference for a centralized government leads to a more favorable teachers' response. Our data

do not confirm this prediction, but Duflo, Dupas and Kremer (2012) do since they observe that parents' empowerment through school committee training reduced the negative response of civil-servant teachers.

Acording to this framework, the conditions of success of this policy are thus (i), (ii), plus the conditions that (iii) teachers are keen to collaborate with parents, and (iv) parents have real authority on teachers. These conditions are more likely to hold in countries where the social gap between parents and teachers is small and where the education system is decentralized. The USA is an example of countries where this policy is likely to work well, whereas Niger and Kenya are not the ideal contexts for encouraging parental control over school management since (iii) and (iv) do not hold. However, one might argue that the short-term negative impact on teachers' effort is the price to pay for potential longer-term positive effect -which our results cannot exclude.

The general picture supported by existing empirical evidence and explained by our model is three-fold: first, an increase in school resources out of parental control tends to decrease parental effort. Second, an increase in school resources under parental control tends to increase parental effort. Finally, the size of the increase in parental effort and of the resulting effect on teachers' effort depends on power imbalances in school: the higher parents' real authority, the larger their response and the resulting increase in teacher's effort, with a risk of adverse effects in contexts where parents are weak. This paper is a first step that uses both formal tests and intuition to build a narrative about community participation in resource management. Our hope is that future work might build on this model to provide additional insights and rigorous empirical tests.

6 Conclusion

This paper provides evidence that increasing the financial resources under the official control of parents increased participation along several dimensions. In particular, parents readily engaged in activities that support the school and supplement the grant with their own inputs. Parents also engaged in activities that help the school staff manage the school. However, parents who are less educated responded less, both in terms of actions that directly oppose to the teachers and in terms of actions that do not, and teachers overall decreased their presence at school. These findings point to the sensitive nature of power dynamics in schools and add to our understanding of the often disappointing effects of education policies (especially in weak institutional contexts). In contrast, we find increases in children participation in school, which we partially attribute to their parents'

practice of participation in school management -in contrast to improvement in school quality. This finding indicates that the benefit of involving parents in school should not only be assessed in the light of service quality, but also in the light of demand for service uptake.

Extrapolating from the specific case of schools, there are three major policy implications of this paper. First, it may not be inevitable that decentralizing financial resources from the central government to local communities will crowd out local contributions, if there is concurrent involvement of the communities and communities are given actual ownership of the transferred resources. Second, the type of participation envisioned by a participation program should take into account the characteristics of the community from whom this effort is being asked, in particular the power dynamics between the person providing the public service and the people benefiting from it. For many observers this finding will likely seem self-evident, yet there continues to be a mismatch between the actions requested of communities and their ability to carry out these actions. This paper provides a theoretical and empirical basis for increasing attention to this aspect of program design. Third, the evidence in this paper supports the idea that the act of participation itself can increase uptake of services, independent of improvements in quality, perhaps through increased familiarity with the public service institution or through nudges to overcome procrastination.

There are several possibilities for further work. First, this model could be tested using alternative data sources (many empirical surveys have been carried out on participation programs in different sectors and different contexts). Second, this model might be adapted to give a more complete picture of the dynamics behind participation. In particular, it may be interesting to account for more subtle or intangible benefits from participating as reputation or altruism, and free-riding. It would also be interesting to unpack the feedback between participation and demand to know how feelings of "ownership" might enter into the community dynamics.

References

[1] Aghion, Philippe and Jean Tirole. 1997. "Formal and Real Authority in Organizations", Journal of Political Economy, 105(1): 1-29

[2] Albornoz, Facundo, Samuel Berlinski and Antonia Cabrales. 2011. "Motivation, resources and the organization of the school system," Working paper.

[3] Alesina, Roberto, and Eliana La Ferrarra. 2000. "Participation in Heterogenous Communities", Journal of Public Economics, pp. 847-904.

[4] Banerjee, Abhijit, Rukmini Banerji, Esther Duflo, Rachel Glennerster, and Stuti Khemani. 2010. "Pitfalls of Participatory Programs: Evidence from a Randomized Evaluation in Education in India", American Economic Journal: Economic Policy, 2(1): 1–30.

[5] Banerjee, Abhijit, Suraj Jacob, Michael Kremer, Jenny Lanjouw, and Peter Lanjouw. 2002. "Promoting School Participation in Rural Rajasthan: Results from Some Prospective Trials", Unpublished.

[6] Bardhan, Pranab. 2002. "Decentralization of Governance and Development", Journal of Economic Perspectives, 16(Fall): 185-205.

[7] Barrera-Osorio, Felipe, Tazeen Fasih, Harry Anthony Patrinos and Lucrecia Santibanez. 2009. Decentralized Decision-Making in Schools, The Theory and Evidence on School-Based Management. Washington D.C.: The World Bank.

[8] Blimpo, Moussa and David Evans. 2011. "School-Based Management, Local Capacity, and Educational Outcomes: Lessons from a Randomized Field Experiment", Unpublished.

[9] Chaudhury, Nazmul, Jeffrey Hammer, Michael Kremer, Karthik Muralidharan, and F. Halsey Rogers. 2006. "Missing in Action: Teacher and Health Worker Absence in Developing Countries", Journal of Economic Perspectives, 20(1): 91–116.

[10] Das Jishnu, Stefan Dercon, James Habyarimana, Pramila Krishnan, Karthik Muralidharan, Venkatesh Sundararaman. 2011. "School Inputs, Household Substitution, and Test Scores", NBER Working Paper No. 16830.

[11] Di Gropello Emanuela. 2006. "A Comparative Analysis of School-based Management in Central America", World Bank Working Paper, 72.

[12] Duflo, Esther, Pascaline Dupas and Mickael Kremer. 2012. "School Governance, Teacher Incentives, and Pupil-Teacher Ratios: Experimental Evidence from Kenyan Primary Schools", Unpublished.

[13] Galiani, Sebastian, Paul Gertler and Ernesto Schargrodsky. 2008. "School Decentralization: Helping the good get better, but leaving the poor behind". Journal of Public Economics, 92(2008): 2106-2120.

[14] Gershberg Alec and Gavin Shatkin. 2007. "Empowering Parents and Building Communities: the Role of School-Based Councils in Educational Governance and Accountability", Urban Education, 42:582-615.

[15] Glewwe, Paul, Michael Kremer, and Sylvie Moulin. 2009. "Many Children Left Behind? Textbooks and Test Scores in Kenya", American Economic Journal - Applied, 1(1): 112-135.

[16] Glewwe, Paul, Michael Kremer, Sylvie Moulin, and Eric Zitzewitz. 2004. "Restrospective vs. Prospective Analyses of School Inputs: The Case of Flip Charts in Kenya", Journal of Development Economics, 74(1): 251–68.

[17] Glewwe, Paul and Michael Kremer. 2006. "Schools, Teachers, and Education Outcomes in Developing Countries", Handbook on the Economics of Education, edited by Erik Hanushek and F. Welch, Elsevier.

[18] Gunnarsson,Victoria, Peter F. Orazem, Mario A. Sánchez and Aimee Verdisco. 2009. "Does Local School Control Raise Student Outcomes? Evidence on the Roles of School Autonomy and Parental Participation", Economic Development and Cultural Change, Vol. 58, No. 1 (October 2009), pp. 25-52

[19] Hanushek, Eric. 2003. "The Failure of Input-Based Schooling Policies", The Economic Journal, Vol. 113, No. 485, Features (Feb 2003), pp F64-F98.

[20] King, Elizabeth, and Berk Ozler. 2005. "What's Decentralization Got to Do With Learning? School Autonomy and Student Performance," Discussion Paper No. 054, Interfaces for Advanced Economic Analysis, Kyoto University, January 2005.

[21] Kling, Jeffrey R., Jeffrey B. Liebman, and Lawrence F. Katz, 2007. "Experimental Analysis of Neighborhood Effects", Econometrica, 75(1): pp 83-119.

[22] Kremer, Michael, and Christel Vermeersch. 2005. "School Committee Empowerment: Preliminary Notes", Unpublished.

[23] Lassibille, Gérard, Jee-Peng Tan, Cornelia Jesse, and Trang Van Nguyen. 2010. "Managing Results in Primary Education in Madagascar: Evaluating the Impact of Selected Workflow Interventions", The World Bank Economic Review, 24(2): 303-329

[24] Pop-Eleches, Christian and Miguel Urquiola. 2012. "Going to a better school: Effects and behavioral issues", Working paper.

[25] Pradhan, Menno, Daniel Suryadarma, Amanda Beatty, Maisy Wong, Armida Alishjabana, Arya Gaduh and Rima Prama Artha. 2011. "Improving Educational Quality through Enhancing Community Participation", The World Bank Policy Research Working Paper No 5795.

[26] Sunstein, Cass and Thaler, Richard. 2008. Nudge: Improving Decisions on Health, Wealth, and Happiness. New Haven, CT: Yale University Press.

[27] World Bank. 2003. World Development Report 2004: Making Services Work for Poor People. New York, NY: Oxford University Press.

[28] World Bank. 2010. "Improving Education and Developing Skills for Economic Growth in Niger." Report of the Africa Region Human Development Department.

Figure 1: Reported Use of Grant Money, by Total Amount Spent
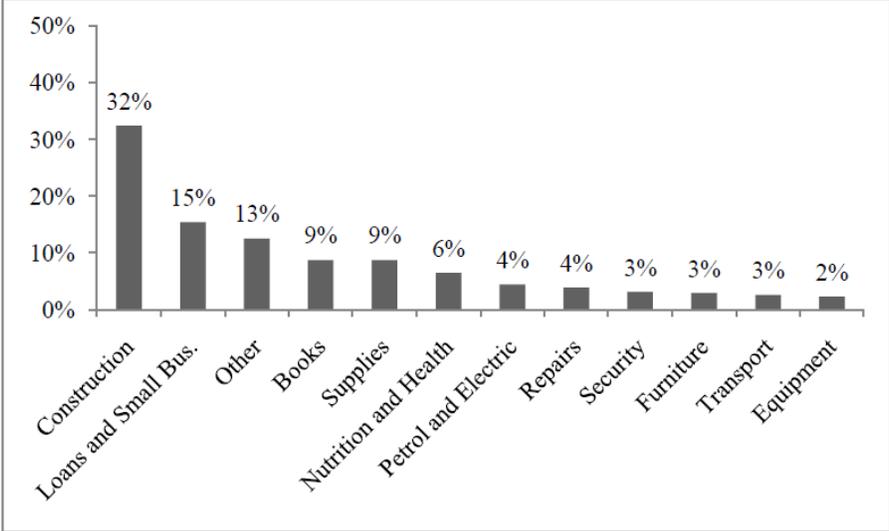
Source: Financial Control over 85 randomly selected schools

Table 1: Pre-program School Characteristics, by Treatment Group

Variable	Treatment	Control	p-value
Number of schools	500	500	
Pupils			
Enrollment*	142	150	0,28
% girls*	0,39	0,39	0,97
Location			
Urban/Rural	0,11	0,11	0,92
Tahoua	0,52	0,51	0,85
Distance to inspection	36,41	36,27	0,94
Distance to health			
center	8,97	8,46	0,71
Infrastructure			
Teachers**	3,13	3,15	0,88
Classrooms**	2,88	2,95	0,63
Latrines**	0,16	0,17	0,93
Water**	0,1	0,08	0,41
Electricity**	0,01	0,01	0,97
Test score			
Grade 6 exam rate**	0,69	0,71	0,48
School Committees			
School Committee exists**	0,91	0,93	0,22
Supported**	0,58	0,59	0,85

P-values are for tests of equality of the means across groups
* Indicates data is from 2007/08
* Indicates data is from 2005/06

Table 2: Community Characteristics, by Treatment Group

Variable	Obs.	Mean	Std. Dev.	Control	Treatment	Difference	p-value
% Girls in 2007/08	1000	0,39	0,11	0,39	0,39	0,00	0,97
Education of school committee	739	0,31	0,46	0,32	0,31	0,01	0,00
% of teachers that are civil servants	765	0,20	0,21	0,20	0,20	0,00	0,73
Seniority of the school Director (years)	720	4,16	2,68	4,22	4,10	0,12	0,53
Distance from households to school (1-5)	768	1,22	0,49	**1,19**	**1,25**	**-0,06**	**0,07**
Average wealth of school committee (PCA index)	718	-0,63	1,46	-0,59	-0,67	0,09	0,42
Director speaks same language (0/1)	709	0,82	0,39	0,82	0,81	0,01	0,70

Source: School survey conducted April-May 2008, except % of girls in 2007/08: 2007/08 administrative data.

Observations at school level. P-values are for tests of equality of the means across Treatment and Control.

Education of school committee=1 if at least one member completed primary school.

Table 3: Attrition, by Treatment Group and Pre-Program School Characteristics

Dependent variable : 1 if data are missing

	(1) Supportive Index	(2) Management Index	(3) Opposition Index	(4) Infrastructure Index	(6) Teacher Presence	(7) Dropout	(8) 2008/09 Enrollment
Treatment	-0.0584	-0.119	-0.0928	0.000846	-0.117	-0.112	-0.00933
	(0.129)	(0.130)	(0.129)	(0.0385)	(0.120)	(0.130)	(0.0312)
T*Enrollment 0708	0.0257	0.0539	0.0329	0.00957	0.0534	0.0582	0.00882
	(0.0529)	(0.0537)	(0.0529)	(0.0147)	(0.0433)	(0.0487)	(0.0103)
Enrollment 0708	-0.0676*	-0.0694*	-0.0727**	-0.0145	-0.0469	-0.0728**	-0.0130*
	(0.0369)	(0.0361)	(0.0368)	(0.0126)	(0.0304)	(0.0332)	(0.00703)
T * % girl 0708	0.0184	0.0245	0.0263	0.000621	0.0289	0.0412	0.00543
	(0.0311)	(0.0310)	(0.0310)	(0.00991)	(0.0296)	(0.0313)	(0.00689)
% girl 0708	0.0201	0.00578	0.0182	0.00424	-0.00568	-0.00928	-0.00490
	(0.0220)	(0.0217)	(0.0220)	(0.00865)	(0.0202)	(0.0217)	(0.00585)
T* Urban	-0.0127	-0.0213	-0.0140	0.00158	-0.0235	-0.0480*	0.00533
	(0.0261)	(0.0257)	(0.0262)	(0.0123)	(0.0204)	(0.0267)	(0.00855)
Urban	-0.0103	0.00123	-0.00882	0.00438	-0.00250	0.0191	0.000749
	(0.0203)	(0.0199)	(0.0203)	(0.00905)	(0.0169)	(0.0210)	(0.00216)
T*Supported	-0.0179	-0.0176	-0.0141	0.00340	-0.00471	-0.00358	-0.00213
	(0.0255)	(0.0254)	(0.0255)	(0.00943)	(0.0227)	(0.0258)	(0.00697)
Supported	0.0209	0.00887	0.0193	-0.00564	0.00442	0.00802	-0.000439
	(0.0178)	(0.0177)	(0.0177)	(0.00765)	(0.0160)	(0.0177)	(0.00511)
T*Number of teachers	-0.00209	0.00666	-0.0102	-0.0146	-0.0262	-0.0316	-0.0170
	(0.0548)	(0.0545)	(0.0548)	(0.0152)	(0.0439)	(0.0513)	(0.0137)
Number of teachers	0.0189	0.0120	0.0226	0.00928	-0.00703	0.0116	0.0150
	(0.0390)	(0.0378)	(0.0389)	(0.0129)	(0.0297)	(0.0341)	(0.0113)
T*Tahoua	-0.0106	-0.0136	-0.00460	-0.0197**	-0.0138	-0.0277	-0.00577
	(0.0284)	(0.0287)	(0.0284)	(0.00983)	(0.0255)	(0.0285)	(0.00714)
Tahoua	0.170***	0.155***	0.168***	0.0198**	0.127***	0.166***	0.00849*
	(0.0200)	(0.0202)	(0.0200)	(0.00821)	(0.0178)	(0.0197)	(0.00506)
Constant	0.0411	0.117	0.0521	0.00793	0.124	0.162*	0.0227
	(0.0924)	(0.0923)	(0.0922)	(0.0330)	(0.0824)	(0.0917)	(0.0244)
Observations	1,000	1,000	1,000	1,000	1,000	1,000	1,000
R-squared	0.144	0.124	0.145	0.015	0.120	0.137	0.009
Mean in Control Group	0.242	0.232	0.240	0.030	0.172	0.236	0.014

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Supported is an indicator for whether the school reported that it was supported by an NGO or community group prior to the grant project

Tahoua is one of the two regions where the project was carried out. It is further north and the schools there experienced security concerns.

Data for the supportive and opposition indices, teacher presence, and dropouts come from the 2008 World Bank Questionnaire.

Data for the management index come from the 2008 World Bank Questionnaire, except for the activity level of the mother's association, which comes from the 2008/09 DSI school census.

Data for the infrastructure index and enrollment in 08/09 come from the 2008/09 DSI school census.

Table 4: Descriptive Statistics - Parent Participation in Control Group Schools

Parent Participation	N	mean	sd
Non-assertive Participation	395	0.00	0.50
Inkind contributions (0/1)	379	0.84	0.37
Funds per pupil (FCFA)	312	293.50	500.70
School committee supervises pupil attend (0/1)	377	0.77	0.31
School committee sanctions pupil attend (0/1)	289	0.71	0.45
Assertive Participation	478	0.00	0.35
School committee collects fees (0/1)	206	0.30	0.46
School committee spends fees (0/1)	206	0.71	0.45
Time since last school committee meeting (months)	277	-2.65	1.56
Time since last parental association meeting (months)	236	-3.69	2.19
School committee responsible for supplies (0/1)	380	0.60	0.49
School committee responsible for infrastructure (0/1)	379	0.74	0.44
Maternal association is active (0/1)	434	0.27	0.45
Parent Oppositional Actions			
School committee supervises teacher attend (0/1)	380	0.77	0.31
School committee sanctions teacher attend (0/1)	380	0.33	0.47

Data Source:School survey conducted in April-May 2008

Sample: Control group schools. Sample size may differ due to missing data.

Table 5: Descriptive Statistics - Infrastructure and Teacher Presence in Control Group Schools

Infrastructure and Teacher Presence	N	mean	sd
% of teachers present at visit	402	0.76	0.35
Infrastructure Index	485	0.00	0.40
Number of latrines in the school	462	1.60	2.74
Water Access (0/1)	443	0.13	0.34
School Enclosure (0/1)	420	0.34	0.48
Number of buildings in the school	474	0.23	0.77
Number of desks in the school	431	3.54	14.32
Number of blackboards in the school	448	0.65	1.61
Number of books in the school	431	6.73	63.22

Data Source:School survey conducted in April-May 2008 and DSI annual school census
Sample: Control group schools. Sample size may differ due to missing data.

Table 6: Descriptive Statistics - Demand for Education in Control Group Schools

Enrollment 2008/09		Boys		Girls		Total	
	N	mean	sd	mean	sd	mean	sd
Number of pupils in school register - Grade 1	493	22	19	18	16	40	33
Number of pupils in school register - Grade 2	493	17	19	13	15	30	32
Number of pupils in school register - Grade 3	493	14	17	9	12	24	27
Number of pupils in school register - Grade 4	493	16	17	10	12	26	27
Number of pupils in school register - Grade 5	493	13	15	8	10	21	24
Number of pupils in school register - Grade 6	493	12	13	7	10	19	21
Number of pupils in school register - Total	493	95	71	66	57	160	123

Data Source:2008-2009 admisnitrative data
Sample: Control group schools. Sample size may differ due to missing data.

Dropouts Spring 2008		Boys		Girls		Total	
	N	mean	sd	mean	sd	mean	sd
% of pupils dropped at visit - Grade 1	271	0,03	0,11	0,03	0,11	0,03	0,10
% of pupils dropped at visit - Grade 2	227	0,03	0,11	0,04	0,15	0,03	0,11
% of pupils dropped at visit - Grade 3	269	0,03	0,09	0,03	0,09	0,03	0,08
% of pupils dropped at visit - Grade 4	236	0,03	0,11	0,04	0,13	0,04	0,11
% of pupils dropped at visit - Grade 5	211	0,03	0,11	0,04	0,13	0,03	0,10
% of pupils dropped at visit - Grade 6	243	0,05	0,11	0,05	0,15	0,05	0,10

Data Source:School survey conducted in April-May 2008
Sample: Control group schools. Sample size may differ due to missing data.

Table 7: The Impact of Grants on Parent Nonassertive Action

Explanatory Variables	Dependent Variable: Nonassertive Action Index						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Treatment (T)	0.141***	0.107**	0.199***	0.0967**	0.151***	0.175**	0.126***
	0.0355	0.0488	0.0685	0.0427	0.0460	0.0830	0.0419
T*civil servant teachers (%)		0.0335					
		0.0383					
T*Director Seniority			-0.0517				
			0.0341				
T*Education of COGES				0.0658*			
				0.0376			
T*Wealth of COGES					0.0255		
					0.0479		
T*Director same lang						-0.0197	
						0.0361	
T*Authority Factor							0.00890
							0.0382
Constant	-0.170	-0.177	-0.158	-0.154	-0.232	-0.110	-0.141
	0.128	0.137	0.142	0.132	0.141	0.145	0.148
Observations	791	753	714	730	709	704	602
R-squared	0.110	0.111	0.102	0.121	0.122	0.118	0.108
Average in Control Schools	0	0	0.02	0.01	0.01	0.01	0.03

Data Source:School survey conducted in April-May 2008

Robust standard errors below point estimates. Regressions include fixed effects at the Inspection level. Controls include a dummy for urban schools, the total enrollment and % girls prior to the program, and whether the school was supported by another organization prior to the program. All regressions with interaction terms include the interacted variable

***, **, * indicate significance at 1, 5, and 10%.

Dependent variable is unweighted average of z-scores of financial and in-kind contributions from parents, whether parents supervise pupil attendance, and whether parents take remdial action for poor pupil attendance.

Sample size may differ due to missing data. Separate regressions of treatment on the outcome using the reduced sample size for each interaction term confirm that differences in the coefficient on treatment are not due to sample reduction - the coefficient on treatment never varies more than 0.014 (regressions available upon request).

Table 8: The Impact of Grants on Parent Assertive Actions

Explanatory Variables	Dependent Variable: Assertive Action Index						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Treatment (T)	0.0825***	0.112***	0.0861*	0.0993***	0.0942***	0.169***	0.104***
	0.0223	0.0376	0.0497	0.0333	0.0312	0.0593	0.0317
T*civil servant teachers (%)		-0.0236					
		0.0272					
T*Director Seniority			0.00182				
			0.0256				
T*Education of COGES				-0.0200			
				0.0283			
T*Wealth of COGES					0.00469		
					0.0303		
T*Director same lang						-0.0324	
						0.0262	
T*Authority Factor							-0.0304
							0.0272
Constant	-0.199**	-0.240**	-0.208*	-0.244**	-0.278**	-0.284**	-0.263**
	0.0887	0.105	0.113	0.106	0.110	0.120	0.122
Observations	961	758	716	737	716	709	604
R-squared	0.049	0.056	0.059	0.058	0.057	0.059	0.063
Average in Control Schools	0	0.01	0.01	0.01	0.01	0	0.01

Data Source:School survey conducted in April-May 2008, except for activity level of the mother's association which is from the Ministry of Education School Census in the fall of 2009.

Robust standard errors below point estimates. Regressions include fixed effects at the inspection level. Controls include a dummy for urban schools, the total enrollment and % girls prior to the program, and whether the school was supported by another organization prior to the program. All regressions with interaction terms include the interacted variable

***, **, * indicate significance at 1, 5, and 10%.

Dependent variable is unweighted average of z-scores of the time elapsed since the last parent meeting, the time elapsed since the last school committee meeting, the activity level of the mother's association, whether the school committee was responsible for fee collection and expenditure, and whether the school committee was responsible for infrastructure and supplies.

Sample size may differ due to missing data. Separate regressions of treatment on the outcome using the reduced sample size for each interaction term confirm that differences in the coefficient on treatment are not due to sample reduction - the coefficient on treatment never varies more than 0.018 (regressions available upon request).

Authority Factor is the predicted factor from a Principal Component Analysis of the variables used for the interactions in columns (2) through (6).

Table 9: The Impact of Grants on Supervision of Teacher Attendance

Explanatory Variables	Dependent Variable: Teacher Supervision						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Treatment (T)	-0.0126	-0.0124	-0.0450	-0.0313	0.0124	0.0214	-0.0154
	0.0219	0.0309	0.0430	0.0263	0.0278	0.0542	0.0238
T*civil servant teachers (%)		-0.00660					
		0.0239					
T*Director Seniority			0.0104				
			0.0227				
T*Education of COGES				0.0397*			
				0.0236			
T*Wealth of COGES					0.0270		
					0.0312		
T*Director same lang						-0.0198	
						0.0232	
T*Authority Factor							0.0171
							0.0232
Constant	0.844***	0.862***	0.832***	0.804***	0.746***	0.859***	0.724***
	0.0820	0.0865	0.0920	0.0847	0.0869	0.0957	0.0916
Observations	758	726	689	720	701	690	596
R-squared	0.064	0.068	0.073	0.073	0.068	0.078	0.080
Average in Control Schools	0.77	0.77	0.77	0.76	0.76	0.77	0.77

Data Source: School survey conducted in April-May 2008.

Robust standard errors below point estimates. Regressions include fixed effects at the inspection level. Controls include a dummy for urban schools, the total enrollment and % girls prior to the program, and whether the school was supported by another organization prior to the program. All regressions with interaction terms include the interacted variable

***, **, * indicate significance at 1, 5, and 10%.

Dependent variable is whether the school committee is responsible for supervising teacher presence.

Sample size may differ due to missing data. Separate regressions of treatment on the outcome using the reduced sample size for each interaction term confirm that differences in the coefficient on treatment are not due to sample reduction - the coefficient on treatment never varies more than 0.016 (regressions available upon request).

Authority Factor is the predicted factor from a Principal Component Analysis of the variables used for the interactions in columns (2) through (6).

Including an the interaction terms for urban and wealth as controls in the regression in column (4) reduces the coefficient on the interaction between treatment and education to 0.0321, and increases the p-value to 0.22.

Table 10: The Impact of Grants on Sanction for Poor Teacher Attendance

Explanatory Variables	Dependent Variable: Teacher Sanction						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Treatment (T)	-0.0120	0.0216	-0.0612	-0.0243	0.0123	-0.114	-0.0212
	0.0337	0.0461	0.0658	0.0419	0.0408	0.0841	0.0388
T*civil servant teachers (%)		-0.0338					
		0.0341					
T*Director Seniority			0.0302				
			0.0348				
T*Education of COGES				0.0260			
				0.0362			
T*Wealth of COGES					0.0375		
					0.0393		
T*Director same lang						0.0386	
						0.0361	
T*Authority Factor							0.0555*
							0.0332
Constant	0.378***	0.356***	0.443***	0.422***	0.430***	0.444***	0.414***
	0.128	0.136	0.144	0.137	0.143	0.150	0.156
Observations	758	726	689	720	701	690	596
R-squared	0.049	0.054	0.053	0.046	0.051	0.057	0.053
Average in Control Schools	0.33	0.32	0.33	0.34	0.34	0.34	0.34

Data Source:School survey conducted in April-May 2008.

Robust standard errors below point estimates. Regressions include fixed effects at the inspection level. Controls include a dummy for urban schools, the total enrollment and % girls prior to the program, and whether the school was supported by another organization prior to the program. All regressions with interaction terms include the interacted variable

***, **, * indicate significance at 1, 5, and 10%.

Dependent variable is whether the school committee sanctions teachers for poor attendance.

Sample size may differ due to missing data. Separate regressions of treatment on the outcome using the reduced sample size for each interaction term confirm that differences in the coefficient on treatment are not due to sample reduction - the coefficient on treatment is changed most for the corresponding reduced sample for column (6), to -0.0326 (a difference of -0.02) but in all cases is insignificant and other than column (6), does not change substantially (regressions available upon request).

Authority Factor is the predicted factor from a Principal Component Analysis of the variables used for the interactions in columns (2) through (6).

Including an the interaction terms for urban as a control in the regression in column (7) increases the coefficient on the interaction between treatment and authority to 0.0565, and increases the p-value to 0.14.

Table 11: The Impact of Grants on School Infrastructure

	Infrastructure Index
Treatment	0.0414*
	0.0236
Constant	-0.454***
	0.0936
Observations	978
R-squared	0.164

Data Source:School survey conducted in April-May 2008 and DSI Annual School Census
inspection level.

*** , ** , * indicate significance at 1, 5, and 10%.

Infrastructure Index is an unweighted average of the z-scores of the number of buildings,
blackboards, latrines and books, and dummies for access to water and school enclosure.

Controls include a dummy for urban schools, the total enrollment and % girls prior to the
program, and whether the school was supported by another organization prior to the
program, and fixed effects at the inspection level.

Table 12: The Impact of Grants on Teacher Presence

Explanatory Variables	Dependent Variable: % of teachers present						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Treatment (T)	-0.0382*	-0.0326	-0.0515	-0.0545**	-0.0574**	-0.0686	-0.0577**
	0.0227	0.0299	0.0406	0.0273	0.0231	0.0587	0.0233
T*civil servant teachers (%)		-0.00412					
		0.0209					
T*Director Seniority			0.00373				
			0.0195				
T*Education of COGES				-0.00424			
				0.0226			
T*Wealth of COGES					0.00241		
					0.0182		
T*Director same lang						0.0123	
						0.0247	
T*Authority Factor							0.0132
							0.0178
Constant	0.937***	0.980***	0.991***	0.936***	0.937***	0.998***	1.012***
	0.0738	0.0782	0.0810	0.0754	0.0780	0.0860	0.0817
Observations	799	765	720	721	700	694	604
R-squared	0.248	0.213	0.208	0.245	0.240	0.210	0.211
Average in Control Schools	0.76	0.79	0.80	0.79	0.79	0.81	0.84

Data Source:School survey conducted in April-May 2008.

Robust standard errors below point estimates. Regressions include fixed effects at the inspection level. Controls include a dummy for urban schools, the total enrollment and % girls prior to the program, and whether the school was supported by another organization prior to the program. All regressions with interaction terms include the interacted variable

***, **, * indicate significance at 1, 5, and 10%.

Dependent variable is the % of teachers present on the day of the unannounced spot check.

differences in the coefficient on treatment are not due to sample reduction - the coefficient on treatment is changed most for the corresponding reduced sample for

Authority Factor is the predicted factor from a Principal Component Analysis of the variables used for the interactions in columns (2) through (6).

Including an interaction terms for urban as a control in the regression in column (7) increases the coefficient on the interaction between treatment and authority to 0.0565, and increases the p-value to 0.14.

Table 13: The Impact of Grants on the Demand for Education: Percent of students enrolled in fall 2007 who dropped out by spring 2008

Explanatory Variables	Dependent Variable: Dropouts (%)						
	(1) Grade 1	(2) Grade 2	(3) Grade 3	(4) Grade 4	(5) Grade 5	(6) Grade 6	(7) Total
Treatment (0/1)	-0.0136*	-0.00646	-0.00791	-0.00778	0.00264	0.00139	-0.00559
	(0.00758)	(0.0107)	(0.00582)	(0.0100)	(0.00849)	(0.00987)	(0.00520)
Constant	0.0366**	0.0613**	0.0678***	0.143**	0.115**	0.0891**	0.0723***
	(0.0183)	(0.0291)	(0.0240)	(0.0570)	(0.0455)	(0.0384)	(0.0165)
Observations	531	434	525	454	381	466	748
R-squared	0.038	0.042	0.046	0.090	0.068	0.104	0.059
Average in Control Schools	0.03	0.03	0.03	0.04	0.03	0.05	0.04

Data Source: School survey conducted in April-May 2008.

Robust standard errors in parentheses. Fixed effects included at inspection level.

***, **, * indicate significance at 1, 5, and 10%.

Controls include a dummy for urban schools, the total enrollment and % girls prior to the program, and whether the school was supported by another organization prior to the program. All regressions with interaction terms include the interacted variable.

Controlling for enrollment in 2007/08 and 2006/7 does not substantially change the results but reduces sample size due to missing data. Regressions available upon request.

Low sample sizes are due to non-reporting or to inconsistent data (eg, the number of dropouts larger than reported enrollment). In addition, many schools do not have all grade levels.

Table 14: The Impact of Grants on the Demand for Education: Enrollment

Explanatory Variables	Dependent Variable: Reported enrollment in 2008-2009						
	(1) Grade 1	(2) Grade 2	(3) Grade 3	(4) Grade 4	(5) Grade 5	(6) Grade 6	(7) Total
Treatment (0/1)	-0.604	3.256**	-0.471	-0.541	0.366	-0.639	1.366
	(1.502)	(1.376)	(1.174)	(1.190)	(1.019)	(0.962)	(2.445)
Constant	34.47***	-1.052	5.214	1.546	-1.388	-1.225	37.56**
	(6.267)	(6.441)	(4.881)	(4.534)	(3.911)	(3.925)	(15.14)
Observations	988	988	988	988	988	988	988
R-squared	0.470	0.545	0.546	0.484	0.520	0.540	0.901
Average in Control Schools	40	30	24	26	21	19	160

Data Source: DSI Annual School Survey

Robust standard errors in parentheses. Fixed effects included at inspection level.

***, **, * indicate significance at 1, 5, and 10%.

Controls include a dummy for urban schools, the total enrollment and % girls prior to the program, and whether the school was supported by another organization prior to the program. All regressions with interaction terms include the interacted variable.

Controlling for enrollment in 2007/08 and 2006/7 does not substantially change the results but reduces sample size due to missing data. Regressions available upon request.

Schools with no existing grade counted were considered to have zero enrollment for that grade.

Table 15: Channel of the Effect on the Demand for Education: Participation or Infrastructure?

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
					Dependent Variable: Grade 2 enrollment in 2008-2009						
Treatment (0/1)	3.256**	2.738*	2.193	2.847**	2.562*	3.175**	3.055**	2.652*	1.911	2.733*	2.022
	1.376	1.507	1.539	1.399	1.420	1.385	1.384	1.513	1.565	1.518	1.569
Indices Included											
Nonassertive			YES						YES		YES
Assertive					YES				YES		YES
Infrastructure Index							YES				YES
Constant	-1.052	-5.105	-4.536	0.249	0.932	-1.244	0.0730	-4.977	-3.786	-5.220	-4.008
	6.441	6.926	6.957	6.570	6.517	6.449	6.511	6.963	6.939	6.975	6.950
Observations	988	783	783	954	954	978	978	780	780	776	776
R-squared	0.545	0.588	0.591	0.547	0.549	0.545	0.546	0.588	0.592	0.589	0.593
Change in Coefficient on Treatment			-20%		-10%		-4%		-28%		-26%

Data Source:School survey conducted in April-May 2008 and DSI school survey in 2009.

Robust standard errors below point estimates. Regressions include fixed effects at the inspection level.

***, **, * indicate significance at 1, 6, and 10%.

Nonassertive action is the unweighted average of z-scores of financial and in-kind contributions from parents, whether parents supervise pupil attendance, and whether parents take remdial action for poor pupil attendance.

Assertive action is unweighted average of z-scores of the time elapsed since the last parent meeting, the time elapased since the last school committee meeting, the activity level of the mother's association, whether the school committee was responsible for fee collection and expenditure, and whether the school committee was responsible for infrastructure and supplies.

Infrastructure index is an unweighted average of the z-scores of the number of buildings, blackboards, latrines and books, and dummies for access to water and school enclosure.

Column (1) gives the main specification with the full sample available. Columns (2), (4), (6), (8), and (10) give the results of the main specification for the sample that has non-missing values for the indices which are being tested. The change in the coefficient on treatment is calculated based on this coefficient, rather than the coefficient in column (1). For example, the change in the coefficient on treatment due to the inclusion of the contribution index is calculated as the difference between the coefficients on treatment given in columns (4) and (6) divided by the coefficient on treatment in column (4). The resulting change is presented at the bottom of the column.

Appendix 1: Compliance with Study Protocol

The school committees, i.e. two representatives, signed a document confirming effective receipt of the grant in the intended amount. These receipts were first collected at the regional level and the information was then entered into a database at the Ministry of Education as a way to verify the actual receipt of the grants at the school level. An additional survey was conducted in 85 randomly selected schools asking detailed questions about the receipt and spending of the grants, and financial management. This questionnaire also included information about any problems with the administration of the grant and qualitative feedback and suggestions from the COGES. The use of the grants was recorded in detail, including the existence of a receipt for each expenditure.

Grants were distributed as follows: the Ministry of Education issued an order to the District level, which allowed the district to withdraw cash from the Treasury to distribute to the schools. The grants were distributed first to the inspectors, and then either directly to the COGES or to other officials who brought the grants to the schools. The vast majority of schools do not have bank accounts, and other mechanisms of distribution were infeasible.

The collection of grant receipts, financial questionnaires, and information from the Ministry indicated that of the 498 of the 500 treatment schools received the grant. Of the two that did not receive their grant, one school had closed, and so their grant was allocated to a school outside of the 1,000 school sample, and the other's grant was mistakenly given to a control school. Of the schools receiving the grant, our information indicates that four schools received less money than had been allocated to them (in 3 cases the schools recieved 500 FCFA less than the assigned grant amount of 73,500 FCFA, and in one case 10,500 FCFA less than the assigned grant amount of 120,500 FCFA), while two schools reported receiving more than had been allocated (one school recieved 2,000 FCFA more than the assigned amount of 122,500 FCFA, and the other received 27,000 FCFA more than the assigned amount of 167,500 FCFA). All in all, the data indicate that 492 out of 500 schools received the exact amount allocated to them, and six others received the grant but not in the correct amount. This is a reasonably high compliance rate[21].

Data from the qualitative questionnaire administered to the 85 randomly selected schools indicate that the majority of those schools received the intended grant amount[22].

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[21] Note that this program was publicized within the administration and careful records were required at each step of transfer of the money. In addition, the government of Niger had recently publicly cracked down on corrupt officials. This suggests that applications of this transfer mechanisms to other contexts might not be so effective.

[22] Among the 85 schools, one school that had been selected for the grant had been closed at the time that the grant arrived. In another case, the grant was accidentally given to another school. In a third case, a school reported

Appendix 2: Description of Indices

The summary index Y is defined to be the equally weighted average of z-scores of its components, with the sign of each measure oriented so that more beneficial outcomes have higher scores. The z-scores are calculated by subtracting the control group mean and dividing by the control group standard deviation. Thus, each component of the index has mean 0 and standard deviation 1 for the control group. If an individual has a valid response to at least one component measure of an index, then any missing values for other component measures are imputed at the random assignment group mean. This results in differences between treatment and control means of an index being the same as the average of treatment and control means of the components of that index (when the components are divided by their control group standard deviation and have no missing value imputation), so that the index can be interpreted as the average of results for separate measures scaled to standard deviation units. The resulting estimate gives location of the mean of the treatment group in the distribution of the control group in terms of standard deviation units.

We create three indices:

- Two indices reflecting different kinds of parent participation:

    - The *nonassertive* index averages together four variables: parent financial and in-kind contributions, and parent supervision of pupil attendance and parent remedial action for pupil absenteeism.

    - The *assertive* index averages together seven variables: frequency of parent association and school committee meetings, whether the mothers' association is active, and whether the school committee is in charge of collecting fees, deciding how fees are spent, supervising infrastructure, and supervising supplies.

- An index of school quality:

    - The infrastructure index is composed of the number of buildings, blackboards, latrines, and books, a dummy for access to water, and a dummy for school enclosure (this is a fence or wall around the school grounds that separates the school from other public space). The data on infrastructure comes from the 2008/2009 annual administrative database

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receiving 500 FCFA less than the intended amount. Two schools reported paying some money to cover transport costs to the person who delivered the grant.

so we can evaluate the impact of the grant in the middle run (around 10 months after the treatment).

Table A1: Impact of Treatment on Components of Nonassertive Index

Explanatory Variables	(1) Funds per Pupil	(2) Inkind contributions (0/1)	(3) Parents supervise pupil attendance (0/1)	(4) Parents take remdial action for pupil attendance (0/1)
Treatment	265.1***	0.0223	-0.0100	-0.00289
	48.97	0.0252	0.0222	0.0375
Constant	125.9	0.634***	0.807***	0.643***
	127.7	0.102	0.0866	0.141
Observations	605	758	754	581
R-squared	0.131	0.077	0.063	0.062

Data Source:School survey conducted in April-May 2008

Robust standard errors below point estimates. Regressions include fixed effects at the inspection level. Controls include a dummy for urban schools, the total enrollment and % girls prior to the program, and whether the school was supported by another organization prior to the program.

***, **, * indicate significance at 1, 5, and 10%.

Table A2: Impact of Treatment on Components of Assertive Index

Explanatory Variables	(1) Time elapsed since last parent meeting	(2) Time elapsed since last School com meeting	(3) Mother's Association is Active	(4) School com in charge of fees collection	(5) School com in charge of fees spending	(6) School com in charge of infrastructure	(7) School com in charge of supplies
Treatment	0.182	0.135	0.0492	0.0767	0.0164	0.0451	-0.0106
	0.200	0.124	0.0299	0.0476	0.0437	0.0307	0.0353
Constant	-4.776***	-3.955***	0.113	0.213	0.555***	0.571***	0.593***
	0.782	0.526	0.119	0.169	0.168	0.109	0.125
Observations	465	549	888	401	403	749	752
R-squared	0.051	0.137	0.066	0.065	0.090	0.064	0.063

Data Source:School survey conducted in April-May 2008, except for activity level of the mother's association which is from the Ministry of Education School Census in the fall of 2009.

Robust standard errors below point estimates. Regressions include fixed effects at the inspection level. Controls include a dummy for urban schools, the total enrollment and % girls prior to the program, and whether the school was supported by another organization prior to the program. All regressions with interaction terms include the interacted variable

***, **, * indicate significance at 1, 5, and 10%.

Appendix 3: Descriptive Statistics

Community Characteristics

Table 2 shows descriptive statistics on the community authority that we use as interactions with the treatment variable to test for heterogenous treatment effects of the program. These statistics are from the 2008 school survey and from the 2007/2008 administrative survey database. It is highly unlikely that these characteristics changed because of the treatment over the experiment period (December 2007-May 2008), either by construction or because the evaluation period is only in the short run (we tested for differences of the means across groups to confirm balance over groups, and p-values are reported in Table 2). They can therefore be used as interaction variables.

Only 31% of school committees in the sample contain at least one member who completed primary school, which indicates an important heterogeneity across communities. Note that there is no significant difference in school committee members' seniority across control and treatment groups, which indicates that the composition of school committee did not react to the grant program in the short run. Note that the average wealth index does not have any material meaning in itself since the scale is one that measures individual's wealth relative to one another. The average wealth index is negative since the two school committee members are poorer, on average, than the school directors, whose data was included in the construction of the wealth index. The standard deviation of this wealth indicator is large (1.46), indicating an important heterogeneity of wealth across communities.

A minority (20%) of teachers in the average school are civil servants. Heterogeneity is large: 42% of schools have no civil servants and 35% have more than one third civil servants. Only 3% of schools have a majority of civil servant teachers. The typical school director has been in his or her position for slightly over 4 years. The variation of school director's seniority is not very large, with a standard deviation of 2.68 years. A very small fraction (6%) of school directors have been in charge for only one year, while 28% have been in charge for five years or more. In 82% of schools, the director speaks the same language as the majority of people in the community, as measured by a dummy equal to one when there is a common language.

Only the control group schools are used to generate the following descriptive statistics in this section, with the objective for these statistics to be indicative of the pre-grant status of schools in Tahoua and Zinder.

Parent Participation in Schools

Table 4 shows descriptive statistics on parent participation in school management. These statistics are computed over the control group schools to represent the natural state of parent participation without the encouragement program.

On average, the school committee's last meeting occured 2.65 months before the survey, whereas parental association's last meeting occured 3.69 months before the survey, which suggests a higher activity of school committees than parental associations. More than half of school committees are responsible for management tasks : 60% of school committees are responsible for school stationary supplies and more than 74% are in charge of teaching materials and infrastructure. Three quarters (77%) of school committees monitor the presence and punctuality of teachers and pupils, but only two thirds (66%) have taken some kind of action against a pupil for absenteeism (pupil remedials), and only one third (33%) have taken some kind of action against a teacher for absenteeism (teacher remedials). Remedial teacher actions include talking to the teacher, warning the teacher, or complaining to the teacher's supervisor. A third of school committees (30%) are in charge of collecting contributions for the school, whereas a large majority of school committees (71%) are responsible for managing expenditure of the fees. Parents participate in providing resources to schools: the average parental contribution is 293 FCFA (about 59 US cents). In 84% of schools the community provided in-kind contributions (such as food, building materials, or labor) to the school.

School Quality

Table 5 shows descriptive statistics on school quality. These statistics are computed over the control group schools to represent the natural state of school quality without the encouragement program.

Teacher Presence Observed absenteeism among teachers is very high. On the day of the unannounced survey visit, 10% of schools were closed (the visit was carried out on a day the school was supposed to be open). Of schools that were open, 16% of school directors were absent, and 24% of teachers were absent.[23]To accurately represent the loss of classroom time and avoid reporting inconsistencies, this figure includes both excused and unexcused absences. Surveyors asked respondents at the school about the reasons for teacher absences. In about one third of schools, no reason was given. The fact that school committee members did not/could not indicate the reasons

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[23]This figure is in line with observed absenteeism rates in other countries; see Chaudhury et al (2006) which surveyed attendance in six countries and found 19% of teachers absent during spot checks.

for teacher absenteeism is cause for concern, since it may indicate a lack of or weak attention to teacher management and supervision. Among schools which provided reasons for teacher absences, the most frequently cited reasons were (i) collecting salaries (34%); (ii) strike (33%); and (iii) illness (19%).

Infrastructure The schools in Niger have low levels of equipment. There are 1.6 latrines per school, and 13% of schools have access to water, while 34% have some sort of basic wall separating the school from other public space. For the infastructure index, the classroom, desks, blackboard and books figures are change from year to year (in order to control for previous levels). On average, schools added 0.23 classroom buildings over the period 2007-2009, 3.5 desks, 0.65 blackboards, and 6.7 books.

Demand for education

Table 6 shows descriptive statistics on the demand for education. These statistics are computed over the control group schools to represent the natural state of the demand for education without the encouragement program.

Overall, 156 pupils registered per school in 2008-2009. Attendance is measured by the ratio of pupils present the day of survey visit by the number of pupils who were registered at the beginning of the school year. An average of 69% of pupils who were enrolled at the beginning of the school year were present at school the day of visit, though this measure is based on a head count and thus may confound absence and drop out. Schools reported that about 3.4% of pupils who were registered at the beginning of the school year dropped out over the course of the year, or about 5 pupils per school on average. The dropout rate is highest in grade 6, at 5%. The dropout rate is not significantly different across boys and girls.