Empowering Parents in Schools: What They Can(not) Do *

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Abstract

Improving service quality via beneficiary participation in managing the service may be unrealistic if a community with low authority must act in opposition to a high authority service provider. We present a framework of how community characteristics change the effectiveness of different types of participation. We use data from a randomized pilot project on participation in school management in Niger to test our predictions. We find that all parents increase participation in ways that support the teachers, but only educated parents increase monitoring of teacher attendance. We also present evidence that participation can be a "nudge" to increased service demand.

JEL Codes: H52, 015, I21, I28

1 Introduction

Public services - clinics, schools, and infrastructure - provide a fundamentally better life for billions of people. Health care and access to clean water help children survive to adulthood, roads and infrastructure connect their world with others, and education provides tools to make informed decisions, participate in the democratic process, and lift themselves and their families out of poverty. Public services are important, and the explosion in access to clinics, schools, roads and water in the last two decades represents an unprecedented increase in the number of people who have access to basic public service in poor countries.

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However, public service quality[1] is often low, and in some cases getting worse as demand increases. Poor quality can result from poor physical infrastructure (such as crumbling roads with deep potholes), lack of recurrent inputs (for example, clinics which lack basic medicines or delays in teacher salary), and ineffective or absent staff.[2] 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 two other principal approaches, increasing inputs without changing management structures and processes and top-down incentives to those who provide the service (such as doctors, teachers or nurses), have not been as successful as hoped. The input-based approach (increasing resources such as textbooks) has had little impact on test scores in several randomized evaluations. The incentive-based approach (paying doctors, teachers, or nurses based on attendance or final outcomes) is often unsuccessful and success seems to depend on context and enforceability.

Beneficiary participation in service management 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 and so planning may be more efficient: for example, the school calendar might be modified to take account of the local agricultural seasons. 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. These two first reasons make beneficiary participation likely to improve the quality of the service through a more efficient monitoring of the provider. Finally, beneficiary participation might increase uptake of the service on its own, regardless of quality improvements. In the case of education, parents who participate in school management may gain logistical information about the school (e.g. deadlines for registration or the possibility of reduced fees), information on the returns to education, and information about school functioning which increases parent confidence in the school staff. When making a decision about enrolling their children or not, these informational gains could increase the benefit that parents anticipate from enrolling their children. Parent participation in school management can also nudge parents so they are less likely to procrastinate on their child's schooling, and encourage them to become more pro-active in their child's education. Under both

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[1]In this paper, we consider quality in a broad sense, in general how "good" the school is in terms of physical and human resources and practices.

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

channels, beneficiary participation might increase enrollment, that is, uptake for the service.

However, the extent to which participation programs can meet these expectations depends in no small part on the willingness, ability and resources of beneficiaries: it may be costly and time-consuming to gather local information, and may be very difficult in practice to put pressure on doctors, teachers, or nurses 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.

Nonetheless, 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[3]. 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 participation programs is highly context dependent, and can vary substantially depending on the design of the program. Effectiveness of these programs depends first on their ability to generate an increase in beneficiary participation, and second, on the extent to which this participation actually improves quality. Programs may fail at the first stage of the process: Banerjee et al (2010) report that in Uttar Pradesh, India, people were not aware of the existence of school committees, and providing information and training to the community had no impact on community involvement in schools. Or programs may fail at the second stage of the process: Olken (2007) found that encouragement enhanced community participation in monitoring village road projects but the increase in participation did not

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[3]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, 2011).

translate into a reduction in corruption. On the other hand, some studies show remarkable success of participation projects. Bjorkman and Svensson (2009) found that community-based monitoring of health centers in Uganda dramatically increased the quality and quantity of primary health care. Duflo, Dupas and Kremer (2011) found a more mitigated result: giving power to school committees over contract teachers (rather than civil-service teachers) was a key factor for improving teacher effort and student learning, but civil-service teachers responded by decreasing their effort and by pushing for their relatives to be hired as contract teachers.

This paper contributes to this literature as follows. While some of the difference in the impact of participation programs is surely due to the intensity and implementation of the programs, we propose that variation in program success is also due to variations in the characteristics of the community and the relationship with the people providing the service, that is, variations in the economic and social context. We construct a basic model which explains why previous evaluations have found differences in the effectiveness of community participation in increasing the quality of public services. This model formalizes the role of power imbalances between the beneficiaries and the service provider, the cost of participating and the extent to which beneficiaries want (have a taste for) for the service.

We also examine different kinds of participatory actions, which is important given the diversity of actions envisoned by program designers: beneficiaries might be organized into committees; undertake projects themselves, such as construction or sanitation; raise funds; supervise, hire, and even fire teachers; engage in awareness campaigns; or simply provide advice to staff. One issue that we consider in this paper is that these different activities imply different requirements of skills, wealth and authority on the part of parents. We categorize school participation activities into three broad types: supportive (parents provide material and labor support to help school staff implement their policies), managerial (parents take an active role in planning projects and organizing the school), and oppositional (parents demand higher quality education from the school staff and take action if necessary). We examine how different community characteristics might either support or hinder these different types of participation.

We test this model using data from a randomized evaluation of a program to increase community participation and school quality in Niger. This program increased the resources under the control of the school committees via a grant to use as seed money for a school project. 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 authority and empowerment. The evaluation was part of a pilot project designed and implemented by the World Bank and the Nigerien Ministry of Education. We use detailed information on parent participation to test our predictions by evaluating the impact of the grant on parental participation for schools with different characteristics. We also evaluate the impact of the grant on school quality and enrollment, and test whether increased enrollment comes from school quality improvements or increased parental participation.

We find an overall positive impact of the grant program on parents' supportive actions in all schools: communities which were given the grant provided more support to school activities and supplemented the grant with additional resources, both financial and non-financial. Subgroup analysis supports some of the more detailed predictions of the model. We find that in situations where the community has (i) a high taste for education or (ii) a low cost of participating, the community is very prompt to undertake supportive actions. We also find an overall positive impact on managerial actions in all schools. But communities overall did not respond to the grant by increasing oppositional actions, specifically supervising teacher attendance: we find that only communities where parents have authority were in a position to increase pressure on teachers for improved quality.

Regarding the impact on school quality, we find mixed effects: an improvement in infrastructure, some improvements in school accountability but not large enough to make a general accountability index significantly different between treatment and control groups, and no improvement in teacher effort, consistent with the fact that most communities did not supervise or sanction teachers. Note that the data allows for observing only short-term impacts on accountability and teacher effort.

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 quality improvements.

These results contribute to the literature on the involvement of communities in monitoring public service providers. There are three key policy implications of these findings. First, providing the community with control over financial resources is an efficient way to increase participation in service management, and even increase household contributions. Second, community participation programs are most effective when local circumstances facilitate the type of actions that the com-

munity is asked to perform. Third, the practice of participation - irrespective of improvements to service quality - can itself be a mechanism to increase service uptake.

The remainder of the paper is as follows. Section 2 presents some background on our current understanding of the effect of beneficiary participation on service quality. Section 3 presents a formal model of the role of parent participation in improving school quality and increasing their demand for education. Section 4 presents the characteristics of the community that we use to test the model. Section 5 presents some background information on education in Niger, and describes the school grant experimental design and related research questions. Section 6 presents the data and our estimation strategy and Section 7 the empirical results. Section 8 concludes.

2   Background on Participation

Our paper is situated at the intersection of a growing literature on quality improvement and a growing literature on beneficiary participation. In particular, our paper begins to formalize an undercurrent in the literature: how different factors influence both the level of participatory activity and its impact on quality.

It is natural to think and hope that improving schools for poor children is a question of additional resources. Unfortunately, evaluations of the impact of increasing inputs in schools have often given disappointing results. 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 (2009) find no effect of decreasing the teacher-pupil ratio (absent other reforms) in Kenya. A recent paper, Das and al (2011), adds to this literature by showing that in two different contexts (Zambia and India), an anticipated increase in school inputs was offset by a decrease in household inputs, which could partly account for the general inefficiency of the input-based approach found in the literature. Unanticipated grants crowed out household inputs less, and increased test scores, but it is difficult to design a realistice policy based on unanticipated inputs.

Randomized evaluations of incentive programs have not been entirely encouraging, either. Researchers have sometimes found improvements in outcomes when modest incentives have been given

to teachers by NGOs (Duflo, Hanna and Ryan, 2008; Muralidharan and Sundararaman, 2006). However, in Kenya, teacher incentives implemented by head teachers had no impact because teachers received the bonus irrespective of their real presence (Kremer and Chen, 2002). In India, payments to nurses conditional on their attendance was initially very effective, but it failed to have any impact after six months when the local health adminstration started providing official excuses for nurse absences (Banerjee, Duflo and Glennerster, 2008).

Evaluations and analysis of programs and policies to increase beneficiary participation give mixed results and hint that the success of a program, or the enforcement of a policy, 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. But the paper admits that community-managed schools are generally established in the poorest and most isolated rural areas so the results do not get rid of selection bias issues. 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 impacts on attendance and learning. 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 Sates, 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.

Interventions that ask communities to monitor the people providing the service - teachers, doctors, nurses, and so on - also differ in their effectiveness according to circumstance. In Uganda, Bjorkman and Svensson (2009) studied a program of community-based monitoring of health centers: local NGOs disseminated the baseline information on the quality of health service delivery and

facilitated village and staff meetings to discuss this information and develop a plan to improve health care provision. The treated communities became more engaged and began to monitor the facility more extensively. However, in Indonesia, Olken (2007) finds that government audits on village road projects reduced corruption while community-based monitoring were ineffective, except on reducing corruption related to wages and also when the monitoring process was not implemented via local elites. In many countries, teachers who are civil servants benefit from a high social status and the protection of a powerful union which negotiates with the central government - this sort of protection may inhibit the ability of communities to monitor and manage the school. In Kenya, Duflo, Dupas and Kremer (2011) found that parent participation in teacher monitoring was ineffective when the teacher was a civil servant. While contract teachers responded positively to school committee supervision, civil servant teachers decreased their effort. However, providing school committees with a training on how to supervise the recruitment of the extra-teacher, to conduct the interviews and to check teacher attendance decreased the negative response of civil-service teachers.

Recent randomized evaluations of grant programs suggest that there are subtle dynamics that determine the effectiveness of projects. 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 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 intervention failed to increase parent participation in school management nor improve effective learning, but when the grant was combined with an intervention fostering the ties between the school committee and a local governing body it was more successful.

In this paper, we propose that such heterogenous responses to participatory programs are not only due to differences in program structure but also to variations in the capacity of the community to respond to the program in the expected way. Many potential barriers could prevent beneficiary participation from improving service quality. Communities may lack the necessary capacity to effectively plan or monitor teachers, and so decentralization of school managment 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. Communities may be too fragmented along ethnic or other lines to work together effectively (Banerjee, Iyer and Somanathan, 2008; Vidgor, 2004; Miguel and Gugerty, 2005; Alesina and La Ferrarra, 2000). Community participation programs may counterintuitively empower local elites and enable resource capture (Reinnika and Svensson, 2004; Bardhan, 2002). Finally, the problems of free riding might be so extreme as to prevent collective action (Olson, 1965).

There are a handful of existing models of community participation. Khwaja (2004) formalizes the "ownership" element of participation by modeling the interaction (planning and decision-making) between the community and the donor in a particular project. Using data from Pakistan, he demonstrates that community involvement in non-technical decisions can improve outcomes, while community involvement in technical decisions can lead to worse outcomes. We focus on the impact of ongoing participation on service quality (rather than participation in project decision making itself), and our model builds on one model, given in Banerjee, Iyer and Somanathan (2008), where individuals individuals decide whether to participate in providing the public good based on their expected benefits (including the probability that their group can capture the benefits of the public good, which is influenced by their own participation level) and expected costs.

3 Model

In this section, we consider a basic model that formalizes the determinants of the level of parent participation in schools, and describes how parent participation can determine quality of and demand for education. The motivation for this model is twofold. First, we want to clarify how the grant program can affect parent participation, school quality and demand for education. Second, we want to show that very classic and reasonable assumptions on school quality and community participation are able to produce predictions consistent with the mixed evidence found in the existing literature.

Our model focuses specifically on parent participation in school functioning, but it could be applied to other public services. Hereafter, "participation" 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.

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3.1 School Quality

Denote school quality by Q. Following the three approaches to improve school quality that we discussed in section 2 (school inputs, top-down interventions and community participation), we propose that Q is given by:

$$Q = Q(f_0, f(e, \theta), G) \tag{1}$$

where G represents exogenous school inputs (say, from the government); f_0 is the school staff's ability to transform one unit of school inputs into school quality (ignoring parent participation in school); and $f(e, \theta)$ is parents' ability to transform one unit of school inputs into school quality by participating in school, which is a function of both the amount of effort invested e and a parameter of efficiency θ: a parent is more efficient if her participation is more easily transformed into improvements in school quality. Efficient parents are those whose effort increases school quality, while inefficient parents are those whose effort decreases school quality (for example, meetings and questions from those parents might slow down school management). Note that parental participation e might take the form of additional contributions or fund raising as well as participation in management of school resources.

Q increases in its three elements G, $f(e, \theta)$, and f_0 (the first derivatives are positive: $\frac{\partial Q}{\partial G} > 0$, $\frac{\partial Q}{\partial e} > 0$, $\frac{\partial Q}{\partial \theta} > 0$ and $\frac{\partial Q}{\partial f_0} > 0$), and a reasonable assumption is that these elements are substitutes, based on the literature (for the specific case of e and G see Das et al (2011)). In particular, marginal returns to parent participation are decreasing and parent participation is a substitute for governmental resources and staff management: $\frac{\partial^2 Q}{\partial e \partial G} < 0$, $\frac{\partial^2 Q}{\partial e^2} < 0$ and $\frac{\partial^2 Q}{\partial e \partial f_0} < 0$, meaning that higher government resources or staff management or parent participation make parent participation less easily transformed into improvements in school quality. On the contrary, participation and efficiency are complement: $\frac{\partial^2 Q}{\partial \theta \partial e} > 0$, meaning that higher parent efficiency makes parent participation more easily transformed into improvements in school quality.

Note that both school staff and parents' ability to transform one unit of governmental school inputs into school quality are likely to be small in the current state of nature since increasing G alone, with no changes to management, has been found to be ineffective at improving school quality (see section 2). The goal of beneficiary participation programs is to increase school quality by increasing the term $f(e, \theta)$.

3.2 Parent Participation

3.2.1 Set-up

We adapt the Roy model of self-selection based on outcomes, where participation in running a school involves costs and benefits for parents. Parents do not coordinate and therefore choose the level of effort that maximizes their individual payoff. The effort that parent i invests in participation in school is denoted e_i.

The private benefit from participation depends on two factors: (i) parent i's direct utility from enrolling their child at school (taste for education) is denoted b_i[4], and (ii) the impact of parent i's participation on school quality Q (where Q is school quality as defined in the previous section). As presented in the previous section, the impact of parent i's participation on school quality depends on the parameter of efficiency θ_i, on other parents' participation (denoted e_{-i}), on staff management f_0 and exogenous resources G.

Finally, the private cost that parent i incurs from participating (e.g. time, money) depends on a parent-specific parameter κ_i and a technology of cost $c(.)$ increasing with effort in a convex way: $c'(e_i) > 0$ and $c''(e_i) > 0$.

In this paper, we focus on a special case where parents from the same community are homogenous: they share the same benefit from enrolling their child $b_i = b$, the same efficiency $\theta_i = \theta$ and the same cost of participating $\kappa_i = \kappa$. Therefore, we restrict the analysis to symmetric equilibria where $e_i^* = e_{-i}^* = e^*$.

The payoff U_i for parent i is equal to:

$$U_i(e_i) = bQ(e_i, \theta, e_{-i}, f_0, G) - \kappa c(e_i) \tag{2}$$

This set-up assumes that parents have perfect information about the school quality function and their efficiency θ[5] and that they do not derive any utility from participating except through the improvement of school quality (inefficient parents whose effort decreases school quality do not participate in this model)[6].

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[4]Banerjee, Iyer and Somanathan (2008) use the term $b_i(n)$, where n is the size of the community. The dependence on n allows for possible congestion effects which might reduce the per-member value of the public good as a community gets larger. The authors acknowledge that constant benefits across community size is a reasonable description of the situation when the community is dealing with a school, a health center or a road, the case of a public (non-rival) good.

[5]One extension of this model might incorporate information problems, for instance where parents have incorrect or imperfect beliefs about their own or other's efficiency.

[6]Another extension of this model could incorporate direct benefits from participation in school due to, for instance,

In equilibrium, member i chooses e_i^* that maximizes U_i, taking e_{-i} as given (Nash Equilibrium). The first order condition of the symmetric equilibrium effort is given by:

$$b\frac{\partial Q}{\partial e_i}(e^*, \theta, e^* f_0, G) - \kappa c'(e^*) = 0 \tag{3}$$

where the marginal benefit of effort equalizes its marginal cost.

3.2.2 The Effects of the Participatory Programs

This simple framework allows us to formalize the anticipated effects of participatory programs. Most of the the participatory programs that we reviewed in section 2 tried to increase participation e by increasing θ, mostly through training, capacity-building and providing information to the community. As explained in Section 4, the intervention that we use to encourage parent participation in school is an increase in the amount of money under the control of parents. In the words of the model, it is an upward shift in θ (parent empowerment) combined with an upward shift in G (grant).

Our objective is therefore primarily to characterize the variations of $e*$ with θ and with G. Equation (3) allows us to use the implicit function theorem to give the expression of $\frac{\partial e^*}{\partial \theta}$, $\frac{\partial e^*}{\partial G}$ (see Appendix 1). Under the assumptions that (i) cost of participation is convex, that (ii) returns to participation decrease and that (iii) parent participation is a complement to parent efficiency and a substitute for governmental resources in the school quality function, $\frac{\partial e^*}{\partial \theta}$ is positive and $\frac{\partial e^*}{\partial G}$ is negative. In this model, such a grant program would have an ambiguous effect on parent participation: it can either increase or decrease parent participation depending on the relative elasticities of parent participation to the shift in power versus the shift in governmental inputs.

3.2.3 The Heterogeneity of Parent Responses to Empowerment

Another objective of this model is to explain the heterogenous responses to beneficiary empowerment programs using reasonable assumptions. We want to consider how the response of e^* to such an increase in θ varies with initial community characteristics θ, b and κ. Appendix 1 gives the expression of $\frac{\partial^2 e^*}{\partial b \partial \theta}$, $\frac{\partial^2 e^*}{\partial \theta^2}$ and $\frac{\partial^2 e^*}{\partial \kappa \partial \theta}$. Here we consider their signs.

Under the same basic assumptions (i), (ii) and (iii) used above, $\frac{\partial^2 e^*}{\partial b \partial \theta}$ is positive and $\frac{\partial^2 e^*}{\partial \kappa \partial \theta}$ is negative. It implies that the response of participation to empowerment is higher in communities

reputation or altruism.

where the taste for education is higher and where the cost of participating is lower. With the additional assumptions that $\frac{\partial^3 Q}{\partial \theta \partial e_i^2}(e^*, \theta, e^*) > 0$ (that is, as participation increases, the returns to participation decrease for all schools, but decrease less in schools with high initial efficiency) and $\frac{\partial^3 Q}{\partial \theta^2 \partial e_i}(e^*, \theta, e^*) > 0$ (that is, as efficiency increases, the returns to participation increase for all schools, and increase even more in schools with high initial efficiency), then $\frac{\partial^2 e^*}{\partial \theta^2}$ is positive.

This framework shows that under quite reasonable assumptions about the school quality function and the cost of participation function, a shift in θ produces an increase in the level of participation which is higher when initial θ and b are high and κ is low. We therefore expect that communities will respond less to community empowerment when the taste for the service is low, the initial capacity or empowerment is low, or the cost of participating is large. These are the predictions that we will test empirically with a participatory program which was homogenous in intensity and implementation.

3.3   Demand for Education

Based on the human capital theory, we assume that education is an investment generating benefits and costs and that parents choose the optimal level of investment that maximizes the net benefit of enrolling their child in school. The benefit of enrolling their child in school was already introduced in the parental participation equation as b_i, and is a function of the number of years of schooling S. Following the literature, we assume that $b_i(S) = \beta_i ln(y(S)) + \alpha_i S$, where β_i is how much parents value consumption in the future (when the child has grown up), reflecting parents' patience, $y(S)$ is the earnings of the child when she has grown up, and α_i is a parameter reflecting parents' taste for education. The benefit of investing in education is therefore determined by two elements: the utility of future consumption derived from child's earnings in adulthood, and the direct utility from having an educated child (see Hanushek, 2006). The cost of enrolling a child in school is denoted $v(S)$ and is convex: $v'(S) = f + dS$, $d > 0$,where f is the fixed cost of enrolling the child each year and d is an additional cost which increases with each year of schooling (consider that opportunity costs of time are likely to be higher for older children). It includes both the direct and indirect costs of school (for example, uniform, supplies, or opportunity costs of time spent at school). Parents therefore choose S to maximize:

$$U_i(S) = \beta_i ln(y(S)) + \alpha_i S - v(S) \tag{4}$$

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A Mincer equation gives $ln(y(S)) = a + rS$, where r is the returns to education, that is the percent increase in earnings for an additional year of schooling. The objective function of the parents is thus:

$$U_i(S) = \beta_i(a + rS) + \alpha_i S - v(S) \tag{5}$$

From which we can easily derive the optimal investment in education $S_i* = \frac{\beta_i r + \alpha_i - f}{d}$.

From this basic model, we see that the demand for education increases with the returns to education r, parents' patience β_i, and parents' taste for education α_i, while decreases with the costs of education reflected by f and d. Increasing parental participation in school can therefore increase the demand for education through three mechanisms. First, school quality improvements, as a consequence of parental participation or increase in school resources, could make parents anticipate an increase in r. Second, the grant program can be captured by parents who decide to decrease fees, which reduces the direct costs of education (f, d).

Third, the practice of participation itself (going to meetings, supporting school activities, etc.) could itself increase demand for education. The way the practice of participation could increase parents' demand for education is two-fold: one way is informational gains, the other is psychological gains. First, participating in school activities can come with better information on returns of education or the trustworthiness of teachers, producing a shift in perceived r, or better information on the logistics of schools (when and how to register, functioning of the school), decreasing the (logistical) costs of education included in (f, d). Second, participation makes education more salient in the set of concerns of the parents: they devote more time to activities related to education, they feel involved and become more pro-active towards education. In that sense, participation to school activities can nudge parents towards enrolling their child by helping them to overcome procrastination or "status quo bias" (Sunstein and Thaler, 2008). This psychological effect could be modeled by an increase in patience β_i (parents' discount factor decreases so the discounted benefit of enrolling their child is more likely to overcome the cost), or simply by a change in the choice architecture in which education would become more salient and receive more attention without changing any of the parameters in the demand equation. This way of thinking is closer to the concept of "nudge" introduced by Sunstein and Thaler (2008). We can formalize this effect by introducing a condition under which parents make a decision on S to maximize their utility, and making such a decision requires a sufficient level of attention paid to this problem set. Denote A the

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level of attention that parents pay to education, and $\underline{A}$ the minimum level of attention below which parents go along with the status quo and above which they consider the maximization problem and choose S^*. Parents' decision set is $\{0 \; if \; A \leq \underline{A}; \; S^* \; if \; A > \underline{A}\}$. The effect of the grant program on their demand for education would go through an increase in A such that A overtakes $\underline{A}$ for some parents whose initial attention was below the threshold.

4 Characteristics of Communities that Determine the Equilibrium

In this section, we discuss the various characteristics that may determine, following our model, the capacity of a community to improve the quality of the school. This is naturally not an exhaustive list, but reflects the variables which are available in our data. We will argue that desire (or taste) for education in and of itself, the authority of parents, the education level of parents, their wealth, the civil servant status and seniority of the school staff, the average distance of the households to the school, and common language between school staff and parents, are all important indicators of how effective the community is likely to be at improving school quality. We use the word "quality" in a broad sense, including whether the school has adequate infrastructure and materials, whether the teacher is present and teaching, the quality of the teaching, extra programs such as school meals which may improve learning, and so on.

Taste for Education

We call taste for education the direct utility from having one's child educated. In our model, taste for education is captured by the parameter α which is an element of the gross benefit of enrolling a child in school b, which in turn is an element in the net utility of enrolling a child in school $U_i(S)$. Parents with a high α gain more benefit from education and so are more likely to invest more effort than parents with low α. The fact that the taste for education can vary across communities would likely be due to differences in social norms.

In our empirical exercise, we use the proportion of girls at school as a proxy for the taste for education. While this approximation may not seem immediately obvious, it derives from equation (6) (the parental demand for education) and two reasonable assumptions (see Appendix 2 for further information). Therefore, while we do not claim that the girl-boy gap in enrollment is a perfect measure for the taste for education in the community, we believe that it is a reasonable proxy, and

we expect the communities where the proportion of girls at school is high to have a higher taste for education and therefore to participate more than the communities where this proportion is low.

Parents' education might also be a proxy for their taste for education. It is possible that more educated parents derive a higher direct benefit from having their child educated than non-educated parents. Note however that parents' education also affects other parameters in our model, namely θ, so we cannot limit this characteristic to only reflecting taste for education.

Real Authority

As modeled by Aghion and Tirole (1997), formal authority (the right to make decisions) need not imply real authority (effective control over decisions). The real authority of parents over the school is captured by the parameter θ. Parents with high θ are more effective at participating (for example, better able to monitor teachers), so in equilibrium they invest more effort, and each unit of effort has a greater impact on school quality, than parents with a low θ. The characteristics that we will use in our empirical framework to capture differences in real authority are the following.

Education   Education may determine real authority in two ways. First, school committees with more education are able to perform tasks that require basic literacy and numeracy, like record keeping, accounting and reviewing school records. Second, education is an important determinant of social status, perhaps especially in countries 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)[7]I have a doubt about this since I think that we decided to keep the value of the education variable for the non-missing member as the value for the school committee itself with the idea that the one who is non missing is the best proxy for the other who is missing. No ?. We expect educated communities to participate more and to be more effective than non-educated communities.

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). We therefore expect wealthier communities to participate more

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[7]When information for one of the members is missing and the other member has not gone to school, we assume that the missing member also did not go to school (that is, we assign a zero value for educated. We do this to avoid dropping observations. Results do not vary substantially when these schools are excluded but the sample size is reduced.

and to be more efficient than poorer communities. 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 aa civil servant. Schools with a high proportion of civil servant teachers should then have parents with lower real authority, and thus lower efficiency and lower parent participation. We measure teacher status by determining 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   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. We expect parents in schools with senior school directors to participate less and to be less effective than those working with recent school directors. (As discussed below, there may be an effect in the opposite direction). The seniority of school director is the number of years that the school director has been in charge at this specific school.

Distance

Average distance of households from the school is likely to be an important ingredient of the cost of participation, κ: distance implies both a direct cost (transportation) and an indirect cost (opportunity cost of additional time spent in participating). A community where households are located far from the school should have lower participation when actions require transportation (going to school for a meeting, visiting pupil parents, etc.). The distance variable we use is an index between 1 and 5, 1 meaning that all students live within 3km from school, and 5 meaning

that all students live further than 3km from school.

Social Proximity

Communities where the school staff and the parent community share multiple social links have higher social proximity. Participation levels are likely to depend on this closeness. The direction of the impact is ambiguous: social proximity or friendship could inflict a social cost on members for oppositional actions (perhaps the personal relationship between a teacher and parent could deteriorate), but high social proximity could also inflict a cost on parents for not participating in actions that help or support the school staff. The influence of social proximity on costs of participation therefore depends on the kind of participatory actions. The size of κ reflects social proximity and the sign will be positive when the participation requires opposition and negative when the participation requires support. The characteristics that we will use in our empirical framework to capture differences in social proximity are the following.

The seniority of the school director The seniority of the school director not only influences parents' real authority, it may also influence social proximity between the community and the school director: the more time s/he has been in charge, the more social ties between the school director and the community. We therefore expect school committees working with senior school directors to put in less effort in oppositional actions / more effort in supportive actions than those working with recent school directors.

Common language between director and community Directors who speak the same language as the community will likely have more social ties with the community, either because of common origins, or because of ease of communication. By contrast, directors who do not speak the same language as the community will probably have fewer social interactions with parents. We therefore expect parents who speak the same language as their school director to participate less in opposition actions and more in supportive actions than those working with school directors speaking a different language.

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

5 Experimental Set-Up

5.1 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.[8] 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.[9] 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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[8] 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%.

[9] 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.

5.2   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, so the treatment schools that used the grant to build classrooms had to supplement the grant through fundraising.[10]

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

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[10]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 recieve 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.

included general guidelines on the use of the grants, but the specific activity to be supported by the grants was decided on by the school committee.[11] 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 coordination problems and issues with the financial transfer mechanism at the central level, the evaluation was terminated after only one year.

5.3 Research Questions and Hypotheses

This paper uses data collected during the evaluation of the school grants pilot project to test the model discussed above.

Overall Impact on Parent Participation

We interpret the randomly allocated grant as an exogenous shift in the power parameter θ. The intuition behind this is that increasing the resources under the official control of the parents increases the real authority of parents: parents have not only the de jure right to decide, but also a de facto control over decisions due control over the money. This should encourage all forms of participation according to our model.

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[11]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.

As discussed in Section 3, the randomly allocated grant is also an exogenous shift in school inputs G. Parental support for school activities could be affected by this shift in school inputs: fund raising, financial contributions or in-kind help could decrease since G is assumed to be a subsitute for these forms of participation. A recent paper by Das et al (2011) gives evidence of this substituability of household and school inputs in a context where parents were not empowered and had no control over the grant.

In the case of Niger, the impact on participation that supplements school inputs is ambiguous since it derives from two contradictory forces: on one side, parent empowerment should increase parent support as control over resources ability to manage the school, and on the other side, the increase in school inputs should decrease parent support since household and school inputs may be substitutes.

As discussed in the next section, we categorize different types of participation activities according to their nature: supportive, managerial, and oppositional. The category of *supportive* activities are those which are most likely to be close substitutes to G, activities which require parent resources: fundraising and in-kind donations, and parent supervision and sanctioning of pupils.

We hypothesize that schools that received the grants will have higher levels of parent participation than schools that did not receive the grants, except for this category of supportive actions on which the effect is ambiguous.

Heterogenous Impact on Parent Participation

We deepen this analysis by investigating heterogeneous impacts. 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. The intuition behind the sub-group analysis is that the increase in participation in response to the grant is likely to vary by the initial level of θ (real authority of parents prior to the grant program), as well as b (parents' perceived benefit of enrolling their child in school) and κ (cost of participating), as shown in section 3. To isolate the respective role of these characteristics, we take advantage of the fact that participation may take many forms, and these forms will respond differently to different characteristics.

Supportive actions supplement school inputs without interfering in school management, so they do not put parents in opposition to school staff, nor do they require any specific ability, for example financial and in-kind donations. They should be encouraged by parents' taste for education and

social proximity with the school staff, while discouraged by distance from school (especially actions involving frequent trips to school and visits to parents).

Management actions are those where the parents act as agents of the school staff in some capacity which requires decision-making or management. These actions require basic literacy and planning skills, and may be time-consuming, for example, taking responsibility for inventory and project planning. Such actions should be positively related to skills (education) and should be encouraged by a high taste for education, while distance from school might be an obstacle.

Oppositional actions are those which put the community in opposition to the school staff. In order to be effective, these types of actions require that the community take (to some extent) an adversarial position against the school staff. One important action of this type is measuring and demanding accountability for teacher attendance. These actions require a high real authority vis-à-vis the teachers. They should also be encouraged by a high taste for education.

Impact on School Quality

Following our model of school quality, the impact of the grant program on school quality Q can go through three channels: one channel is parent empowerment (the shift in efficiency θ). Another channel is the shift in resources G (because the grant itself increases school inputs). A third channel is the shift in the level of participation $e*$resulting from the shift in θ and the shift in G which, as discussed above, has an ambiguous direction. This design therefore uses resources and participation as complements, with the limitation that it does not allow for testing the complementarity itself[12].

Impact on the Demand for Education

As shown in the theoretical section, the grants could affect the demand for education through an increase in school quality, or a decrease in the cost of education (if the parents capture the grant to decrease their contributions), or through the very practice of participation which could come with informational gains and/or psychological gains. Empirically, we will be able to disentangle between

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[12]To do so, the ideal experimental design would have been to give grants to school committees in the treatment group, and to give the exact same grants to school directors in the control groups. With such a design, the only difference between treatment and control schools would have come from community participation. However, the grants were small (on average \$209 per school, \$2 per student) so the increase in resources per se is unlikely to induce important improvement in school quality. As a comparison, the textbook experiment in Kenya provided schools with grants of 2.65\$ per pupil and did not have any impact on educational outcomes (learning, enrollment and dropouts) (Glewwe and al., 2009). The extra-teacher program in Kenya, dividing the pupil-teacher ratio from 82 to 43 on average with a cost of 2.93\$ per pupil per year, did not have any impact on educational outcomes in the absence of any other changes (Duflo and al., 2009, report that the cost of a contract teacher is 240\$ per year, which divided by 82 students gives the 2.93\$ price per student per year). More generally, impact evaluations seem to be converging to a consensus that providing extra resources has little impact on education outcomes (see Glewwe and Kremer, 2006, for a review).

school infrastructure quality improvements and an increase in the practice of participation, but not between the informational and the psychological nudges from the practice of participation.

6 Data and Empirical Strategy

6.1 Data

6.1.1 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 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.

6.1.2 Outcomes of Interest

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 details the methodology and the composition of the indices used in this paper.

Parent Participation in Schools   Based on the insights from the model, we create three outcomes reflecting different kinds of participation. First, the *supportive* index aggregate actions where the parents are not making any decisions about school management or entering into (potential) conflict with the teachers, but rather are helping the school staff execute their management decisions (see in Appendix 4 the components of this index). Second, the *management* index averages variables

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reflecting parents and school committee involvement in actions that imply taking some responsibility for school management (see in Appendix 4 the components of this index). Third, *oppositional* actions are tested separately since we observe only two variables: supervising teacher attendance and sanctioning teachers.

Descriptive statistics on parent participation in control group schools are presented in Table 4 and commented in Appendix 5.

School Quality   We measure school quality using data from the unannounced April/May 2008 questionnaire and the annual administrative database. We construct three indices of school quality: infrastructure, accountability, and teacher effort. The data on infrastructure comes from the 2008/2009 annual administrative database so we can evaluate the impact of the grant in the middle run (around 10 months after the treatment). The data on accountability and teacher effort comes from the April/may 2008 questionnaire so we measure the short term impact of grants on accountability (around 5 months after the treatment).

Descriptive statistics on control group schools' quality are presented in Table 5 and commented in Appendix 5.

Demand for Education   We measure demand using dropouts reported at the April/May 2008 questionnaire and the change in enrollment from fall 2007 to fall 2008 reported to the Ministry of Education (by class).

Descriptive statistics on demand for education in control group schools are presented in Table 6 and commented in Appendix 5.

6.1.3   Attrition

There is some attrition in both of these 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.

6.2 Empirical Strategy

Local Average Treatment Effect We first 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:

$$Y_j = \beta T_j + X_j \gamma + \varepsilon_j \tag{6}$$

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.[13] 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 participation varies according to the predictions of our model. We run regressions of the form:

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[13]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.

$$Y_j = \beta T_j + \theta C_j \times T_j + \sigma C_j + X_j \gamma + \varepsilon_j \tag{7}$$

where C_j denotes a characteristic of the community that is expected to change the impact of the grant program on the outcome variables. In this case θ is the additional (or reduction of) impact for schools with characteristic C_j.

Since some of these characteristics are correlated with one another, we check that the estimate of the coefficient on the interaction term is not driven by other characteristics by adding the correlated characteristics and the corresponding interactions as additional covariates as soon as the correlation between the characteristics is above 0.1. Finally, 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.

Identifying Channels of Impact   We generate evidence on channels of impact 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:

$$Y_j = \beta_2 T_j + \phi C_j + X_j \gamma + \varepsilon_j \tag{8}$$

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.

7   Results

7.1   Effect of Grants on Parent Participation in Monitoring Schools

We find evidence that parent empowerment increases parent participation in schools and that this increase consistently varies with community characteristics (although some estimates are imprecise).

Supportive Actions   Table 6 shows the impact of grants on community participation in supportive actions. The overall effect of grants is that parents increased their support for school 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. The analysis of detailed variables composing this index (results not shown) show that most of this overall effect comes from an increase in parental contributions to schools, 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 is unsurprising given that many schools used the grant to initiate new projects, such as classroom construction. This result is evidence that the positive effect of parent empowerment on parental support can dominate the negative effect of substituability with school inputs.[14] This implies that input-based policies should be directed to communities rather than school directors to take advantage of increasing empowerment to reduce crowding out (or even foster crowding in), unless the policy objective is to relieve parents of the burden of financing their schools.

The impact is larger when the school committee is educated and when the proportion of girls at school is high, which is consistent with our view that the taste for education increases the benefits to education and thus participation. When the school committee is educated parents are 9 percentage points more likely to make in-kind contributions to school in the treatment group than the control group (0.24 of a standard deviation).

The impact is significantly smaller when families live farther from school (Column (7)). This is not likely to be due to more remote households being poorer and thus unable to afford financial or in-kind contributions: the detailed analysis reveals that this is driven by reductions in the likelihood that the community supervises pupil attendance or takes remedial actions for pupil absenteeism (usually visiting and talking to parents). Since these actions require traveling to the school or to households, this finding is consistent with our predictions that increased cost (travel time) may reduce participation.

We do not find any difference in impact by common language with director or director seniority, which could have reflected social proximity and therefore encouraged supportive actions. However, consistently with our predictions, we do find that parents' involment in supportive actions varies with parents' taste for education and distance from school.

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[14]An alternative interpretation would be that this result derives from the fact that we mesure 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.

Management Actions   The impact of grants on parent participation in management actions is reported in Table 7. The overall effect of grants on the index of *management* actions is positive: the mean index of the treatment group is about 0.09 standard deviations above the mean of the control group, depending on the specification. 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[15] (from 27% to 32%). We also see a five percent increase in the frequency of parental association and school committee meetings and on the responsibility of infrastructure.

The average treatment effect does not vary with community characteristics, which does not support our predictions.

Oppositional Actions   Consistent with the model, only communities where the school committees were educated increased their participation in oppositional actions (Table 8) (there is no overall impact). Teacher supervision is 0.13 standard deviations higher in the treatment group over the control group when the school committee is educated (the proportion of school committees supervising teacher attendance increased from 77% in the control group to 81% in the treatment group). The interactions of the treatment with the wealth of school committee and with the proportion of girls at school exhibit positive and quite large (though too imprecisely estimated) coefficients, which is consistent with the role of real authority and taste for education in community involvement; note also the negative and quite large (also too imprecisely estimated) coefficients on the interactions with the fact that the school director speaks the same language than the community, a proxy of social cost, and the distance from school, a proxy of direct cost.

Table 9 shows that the school committees in the treatment group were not more able to undertake remedial actions against teachers than in the control group. Again, the coefficients on education of the school committee, wealth of the school committee and the proportion of civil servant teachers, which reflect real authority, are consistent with our predictions and quite large, though not statistically significant due to big standard errors.[16]

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[15]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.

[16]One issue that we might have in this empirical test is a relative lack of variation in community characteristics: as shown by the small standard deviations in Table 2, the experiment was done on relatively homogenous communities. This definitively dampens our capacity to give clear evidence of the predictions of our model. Even the educated parents have low levels of formal education (very few parents completed any education beyond primary school) so their real authority remains limited compared to contexts in which a fair proportion of parents are more educated than teachers like in developed countries. In light of this, the fact that few of the communities undertook remedial actions against teachers is consistent with our prediction that real authority matters.

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

7.2 Effects of Grants on School Quality

As shown in Table 8, we find no general *short-term* improvement in the school quality. First, the accountability index overall showed no change, although there was improvement in some components of the accountability index.[17] We also find no short-term improvement in teacher effort.[18] Note that the hypothesized chain of impact (the grant leads to increased participation which in turn leads to increased quality) may require more time and longer follow up than was possible in this context, and so the absence of impact on accountability and teacher effort should be considered in this light.

In the *longer term* (one year after the treatment), we find an 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.[19] 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 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 is likely to be due to increased financial parent contributions as well as the grant itself.

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[17] In the detailed components of the index (results on detailed components not shown), we find a significant increase in the use of registers for fee collection and spending. This view that the grant improved financial record keeping is reinforced by the results of the qualitative questionnaire taken by 85 schools: many communities said that the program increased their capacity to keep track of expenses and their effort to have receipts, although having receipts for everything was generally difficult for the communities. Other impacts on accountability are not consistent across specifications.

[18] The negative (non significant) coefficient is unexpected. Feedback from the field revealed that the 2007-2008 school year was particularly bad in terms of strikes and teacher absenteeism due to an exceptional delay in salary payments. It is possible that teachers in the treatment group may have felt particularly resentful of the delay since they knew of a cash lump sum transfer to their school. While it is not possible to test or confirm this hypothesis, it is reasonable to suspect that 2007-2008 was a year with a particular set of political events that may make this negative (non significant) impact not generalizable.

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

7.3 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 9 reports the impact of grants on pupil enrollment (top-half) and on pupil dropouts (bottom-half). Younger pupils exhibit fewer dropouts at the end of 2007-2008 for pupils in Grade 1 (though the decrease in dropout is not significant for girls), and fewer dropouts for girls in Grade 2. The decrease in dropouts represents 0.17 standard deviations, which means a decrease of two percentage points from a dropout rate of three percent (a 66 percent decrease). These findings are supported by higher enrollment in 2008-2009 in Grade 2 for both boys and girls. The increase in enrollment represents 0.10 standard deviations, which means an increase of 1.5 students in Grade 2 from an enrollment of 12 pupils (a 12.5 percent increase). The grant thus increased school participation for the youngest pupils.

The fact that the demand increases only for Grade 1 and 2 suggests that the demand for education is more elastic when the child is young, which is consistent with the two classical ideas that the marginal returns to education decrease, 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.

7.4 Channels of Impact on Demand

Table 10 reports the test for channels of the impact on demand, with two competing channels: practice of participation versus quality improvements. We test for the practice of participation channel using an index of participation which is simply a combination of the supportive and managerial indices; we test for the quality improvement channel using the infrastructure index. The outcome is the number of pupils enrolled in second grade in the fall of 2008/2009. The sample is restricted to observations that have data for both potential channels. The first pair of columns shows that when the participation index is added to the regression of enrollment, the coefficient on treatment drops from 0.099 standard deviations and significant at the 5% level to 0.079 and non-significant (a 20 percent decrease in point estimate)[20] . On the contrary, adding the infrastructure index shows no drop in the point estimate or change in significance (column 3). Including both channels together

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[20]Note that the coefficient on treatment is different from the previous estimate of the impact of treatment on enrollment because the sample is restricted to schools that have data on participation and infrastructure in order to avoid confounding a change in the coefficient induced by the addition of the channel variable with a change in the coefficient induced by a reduction in the sample size.

yields the same results (column 4).

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.[21] This effect could be due to informational effect (better informed parents get a larger benefit of enrolling their child) or psychological effect (involved parents have less problems with procrastination and are more pro-active) of participating. Policies to foster parent participation might thus help advance two different goals: improving the quality of schools and increasing demand for education.

7.5 Reconciling Existing Evidence on Beneficiary Empowerment in Public Services

As discussed in section 2, the literature on beneficiary empowerment policies shows both successes and failures. We think that the model proposed in this paper can help to explain this mixed evidence. Some of the papers in this literature implement formal tests for heterogenous effects along with community characteristics, but not all of them. In all cases, we can point to contextual differences across existing field experiments to show suggestive consistencies with our model.

Parent Empowerment in Schools

Banerjee et al (2010) report that providing information and training to the parents about the role and activities of the school committee had no impact on the activity of the school committees in Uttar Pradesh, India. The explanation is unlikely to be found in a low private perceived benefit from education since parents who were given the opportunity to volunteer to tutor children in educational activities responded enthusiastically. These results are consistent if parents have low efficiency or high social cost of changing the quality of schooling : the intervention did not provide the community with higher real authority but rather information and tools to measure effective learning. The authors actually reported that parents may have been pessimistic about their ability to influence the system. This failure might be therefore explained by the power dynamics in the Indian educational context.

Duflo, Dupas and Kremer (2011) also give evidence of the importance of real authority in success of parent empowerment. In Kenya, the intervention represented a substantial shift in the real

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[21] 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).

authority of the parents since the school committees were given the responsability for hiring (and later firing) new contract teachers[22]. The authors observed high level of effort from the contract teachers under the supervision of the school committee, while the civil-service teachers decreased their effort and lobbied for their relatives to obtain the contract teacher positions. The difference in parent power vis-à-vis the contract teachers and the civil-service teachers thus translated directly into different responses to parent empowerment. Moreover, an additional shift in the school committee capacity through the school-based management training[23] decreased this negative response of civil-service teachers. The results of this study highlights the importance of real authority in participatory programs.

In a field experiment in Gambia, Blimpo and Evans (2011) studied the combination of a training for school committee members, and a grant to encourage parents to get involved in school management. This combination increased parent participation and the demand for education (measured by pupil attendance in Gambia and by enrollment and dropouts on Niger) and, in Gambia, was more effective than a grant alone. Blimpo and Evans do not test for heterogenous parent participation along parent characteristics but they do test for heterogenous effects of the encouragement to participate on learning outcomes, and find a positive effects only when the school committee members were educated, which is again consistent with our model.

Finally, 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 intervention alone failed to increase parent participation in school management and did not improve effective learning. However, consistent with our model, adding an intervention that promoted the committee's real authority by fostering the ties between the school committee and a local governing body proved more successful.

Beneficiary Empowerment in Other Sectors

In Uganda, Bjorkman and Svensson (2009) found that empowering local communities to monitor health centers dramatically increased the quality and quantity of primary health care. An important difference with the experiments in education is that people benefit more from health care than from

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[22]The contract teachers are paid less than regular teachers and their contract renewal depend on the decision of the school committee. In contrast, the regular civil-service teachers were hired and managed by the Ministry of Education, and they benefited from strong unions and civil-service protection plus high wages and benefits.

[23]Parents were encouraged to supervise the recruitment of the extra-teacher, taught how to conduct the interviews and to check teacher attendance. Two parents were asked to volunteer to perform spot checks and were given a notebook to record teacher attendance. A sub-committee was formed to evaluate the contract teacher and deliver a performance report.

education: health is not only an issue with higher stakes (life and death) and more relevant for everyday comfort than education, but the benefits are often experienced today whereas education has many benefits in the long term (except for the immediate benefit from a taste for education), and delays in benefits may dampen parent mobilization in presence of procrastination.

Finally in Indonesia, Olken (2007) found that the encouragement[24] enhanced community participation to the road project meetings, but the increase in participation is small and did not translate into a reduction in corruption except missing *labor* expenditures (not *materials* expenditures). The author suggests that people have stronger incentives to monitor wage payments (because that money would otherwise be given to workers), which underlines the role of parameter b (benefit from using the service) in explaining community participation.

These existing mixed findings become coherent using the insights provided by our model. Our paper is obviously a first step that uses both formal tests and intuition to build a narrative about community participation. Our hope is that future work might build on this model to provide additional insights and more rigorous empirical tests.

8   Conclusion

Building on previous research on community-based monitoring of public services, the paper clarifies and formalizes the circumstances under which community participation can increase service quality. We find that increasing the financial resources under the official control of parents increased participation along several dimensions. In particular, parents readily engage in activities that support the school and supplement the grant with their own inputs, especially those parents with higher benefit from enrolling their child and lower cost of participating. Parents also engage in activities that help the school staff manage the school. However, except for those who are educated, parents respond less in terms of actions that directly oppose the teachers. Our findings on management quality are inconsistently positive, and we find a small but significant improvement in material quality. In contrast, we find increases in the demand for education which we partially attribute to the practice of participation, and support this channel by showing that participation accounts for at least some of the variation in demand induced by treatment, while improvements in infrastructure account for almost none.

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[24]Villagers were encouraged to participate at accountability meetings through (a) invitations and (b) invitations + anonymous comment forms sealed in drop boxes and summarized during the accountability meeting.

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 empowerment 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 benefit from the service, the cost of participation and 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 information problems, 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.

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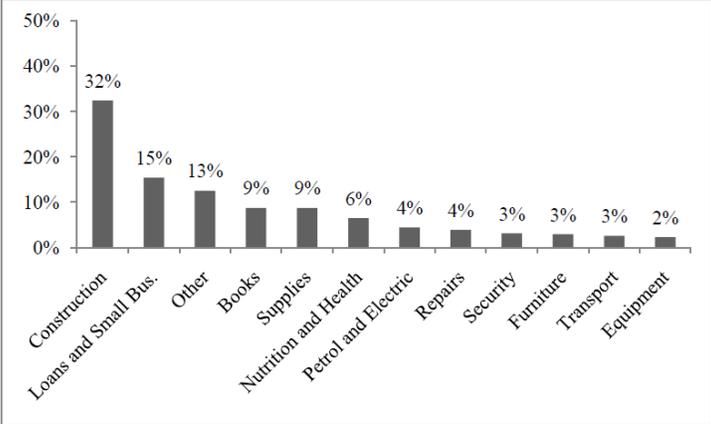
Source: Financial Control over 85 randomly selected schools

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

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				Dependent Variable: 1 if data is missing				
	Supportive Index	Management Index	Supervising Teachers and Remedial Action	Infrastructure Index	Accountability Index	Teacher Effort Index	Dropouts	2008/09 Enrollment
Treatment (T)	-0.0584	-0.119	-0.0928	0.000846	-0.0360	-0.117	-0.112	-0.00933
	(0.129)	(0.130)	(0.129)	(0.0385)	(0.123)	(0.120)	(0.130)	(0.0312)
T*enrollment 0708	0.0257	0.0539	0.0329	0.00957	0.0633	0.0534	0.0582	0.00882
	(0.0529)	(0.0537)	(0.0529)	(0.0147)	(0.0447)	(0.0433)	(0.0487)	(0.0103)
enrollment 0708	-0.0676*	-0.0694*	-0.0727**	-0.0145	-0.0524*	-0.0469	-0.0728**	-0.0130*
	(0.0369)	(0.0361)	(0.0368)	(0.0126)	(0.0313)	(0.0304)	(0.0332)	(0.00703)
T* % girl 0708	0.0184	0.0245	0.0263	0.000621	0.00859	0.0289	0.0412	0.00543
	(0.0311)	(0.0310)	(0.0310)	(0.00991)	(0.0304)	(0.0296)	(0.0313)	(0.00689)
% girl 0708	0.0201	0.00578	0.0182	0.00424	0.00691	-0.00568	-0.00928	-0.00490
	(0.0220)	(0.0217)	(0.0220)	(0.00865)	(0.0206)	(0.0202)	(0.0217)	(0.00585)
T*Urban	-0.0127	-0.0213	-0.0140	0.00158	-0.0210	-0.0235	-0.0480*	0.00533
	(0.0261)	(0.0257)	(0.0262)	(0.0123)	(0.0224)	(0.0204)	(0.0267)	(0.00855)
Urban	-0.0103	0.00123	-0.00882	0.00438	-0.00155	-0.00250	0.0191	0.000749
	(0.0203)	(0.0199)	(0.0203)	(0.00905)	(0.0180)	(0.0169)	(0.0210)	(0.00216)
T*supported	-0.0179	-0.0176	-0.0141	0.00340	-0.0152	-0.00471	-0.00358	-0.00213
	(0.0255)	(0.0254)	(0.0255)	(0.00943)	(0.0234)	(0.0227)	(0.0258)	(0.00697)
Supported	0.0209	0.00887	0.0193	-0.00564	0.0119	0.00442	0.00802	-0.000439
	(0.0178)	(0.0177)	(0.0177)	(0.00765)	(0.0165)	(0.0160)	(0.0177)	(0.00511)
T*Number of teachers	-0.00209	0.00666	-0.0102	-0.0146	-0.0297	-0.0262	-0.0316	-0.0170
	(0.0548)	(0.0545)	(0.0548)	(0.0152)	(0.0452)	(0.0439)	(0.0513)	(0.0137)
Number of teachers	0.0189	0.0120	0.0226	0.00928	-0.0102	-0.00703	0.0116	0.0150
	(0.0390)	(0.0378)	(0.0389)	(0.0129)	(0.0307)	(0.0297)	(0.0341)	(0.0113)
T*Tahoua	-0.0106	-0.0136	-0.00460	-0.0197**	-0.0277	-0.0138	-0.0277	-0.00577
	(0.0284)	(0.0287)	(0.0284)	(0.00983)	(0.0263)	(0.0255)	(0.0285)	(0.00714)
Tahoua	0.170***	0.155***	0.168***	0.0198**	0.157***	0.127***	0.166***	0.00849*
	(0.0200)	(0.0202)	(0.0200)	(0.00821)	(0.0185)	(0.0178)	(0.0197)	(0.00506)
Constant	0.0411	0.117	0.0521	0.00793	0.0769	0.124	0.162*	0.0227
	(0.0924)	(0.0923)	(0.0922)	(0.0330)	(0.0850)	(0.0824)	(0.0917)	(0.0244)
Observations	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
R-squared	0.144	0.124	0.145	0.015	0.149	0.120	0.137	0.009
Mean in Control Group	.242	.232	.240	.030	.198	.172	.236	.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 local community group prior to the grant project.

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

Data for the supportive index, teacher supervision and remedial, teacher effort index, accountability index 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 2008/09 enrollment come from the 2008/09 DSI school census.

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

Parent Participation Indices	N	mean	sd
Supportive Actions Index	379	0,00	0,51
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
Management Actions Index	384	0,00	0,39
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
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 - School Quality in Control Group Schools

School Quality Indices	N	mean	sd
Accountability Index	401	0,02	0,42
Register for visits (0/1)	388	0,52	0,50
Register for inventory (0/1)	368	0,89	0,28
Register for activities (0/1)	391	0,22	0,42
Register for fundraising (viewed) (0/1)	314	0,49	0,50
Register for expenses (viewed) (0/1)	309	0,48	0,50
Minutes at last school committee meeting (0/1)	372	0,59	0,49
Minutes at last parental association meeting (0/1)	367	0,52	0,50
School action plan (viewed) (0/1)	463	0,48	0,50
Register for teacher attendance (0/1)	356	0,17	0,38
Register for pupil attendance (0/1)	289	0,71	0,45
Teacher Effort Index	414	0,00	0,72
% of teachers present at visit	385	0,82	0,29
School is open at visit (0/1)	405	0,90	0,31
Director present at visit (0/1)	399	0,84	0,37
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
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 Supportive Actions

	Dependent Variable: Index of participation in Supportive activities							
Explanatory Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treatment (T)	**0.141***	**0.105**	**0.202***	**0.0957**	**0.149***	**0.372***	**0.173**	-0.121
	0.0367	**0.0506**	**0.0696**	**0.0430**	**0.0471**	**0.0936**	**0.0843**	0.132
T*civil servant teachers (%)		0.0356						
		0.0392						
T*Director Seniority			-0.0534					
			0.0347					
T*Education of COGES				**0.0659***				
				0.0383				
T*Wealth of COGES					0.0238			
					0.0497			
T*HH Distance						**-0.0963***		
						0.0351		
T*Director same lang							-0.0188	
							0.0368	
T* % girls								**0.0737**
								0.0356
Constant	-0.172	-0.189	-0.174	-0.160	-0.243*	-0.328**	-0.111	-0.0426
	0.131	0.140	0.144	0.133	0.143	0.145	0.146	0.140
Observations	758	726	690	720	701	721	691	758
R-squared	0.112	0.113	0.104	0.121	0.122	0.126	0.119	0.117

Data Source:School survey conducted in April-May 2008

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

***, **, * indicate significance at 1, 5, and 10%.
Dependent variable is unweighted average of z-scores of financial and in-kind contributions from parents, and whether parents supervise pupil attendance and/or take remedial actions for absent pupils
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 0,022 (regressions available upon request).

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.

Table 8: The Impact of Grants on Parent Management Actions

	Dependent Variable: Index of participation in Managerial activities							
Explanatory Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treatment (T)	**0.0911***	**0.116***	**0.0918***	**0.101***	**0.0971***	0.0185	**0.184***	0.105
	0.0276	**0.0388**	**0.0509**	**0.0342**	**0.0333**	0.0793	**0.0625**	0.109
T*civil servant teachers (%)		-0.0241						
		0.0277						
T*Director Seniority			6.24e-05					
			0.0263					
T*Education of COGES				-0.0196				
				0.0291				
T*Wealth of COGES					0.00684			
					0.0332			
T*HH Distance						0.0284		
						0.0314		
T*Director same lang							-0.0372	
							0.0273	
T* % girls								-0.00405
								0.0292
Constant	-0.240**	-0.246**	-0.214*	-0.245**	-0.286**	-0.248**	-0.298**	-0.247**
	0.102	0.109	0.117	0.110	0.115	0.121	0.124	0.115
Observations	768	734	696	715	695	731	690	768
R-squared	0.052	0.057	0.059	0.057	0.057	0.054	0.059	0.052

Data Source:School survey conducted in April-May 2008

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

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

Dependent variable is unweighted average of z-scores of time elapsed since last parent association meeting, time elapsed since last COGES meeting, whether the mother's association is active, whether the COGES is in charge of fee collection, fee spending, supervising infrastructure, and supervising 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 0,004 (regressions available upon request).

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.

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

Explanatory Variables	Dependent Variable: Opposition: Whether the COGES is responsible for supervising teacher attendance							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treatment (T)	-0.0415	-0.0405	-0.148	-0.103	0.0407	0.158	0.0702	-0.283
	0.0718	0.101	0.141	0.0862	0.0911	0.193	0.178	0.285
T*civil servant teachers (%)		-0.0217						
		0.0786						
T*Director Seniority			0.0342					
			0.0744					
T*Education of COGES				**0.130***				
				0.0773				
T*Wealth of COGES					0.0888			
					0.102			
T*HH Distance						-0.0892		
						0.0708		
T*Director same lang							-0.0651	
							0.0763	
T* % girls								0.0681
								0.0763
Constant	2.769***	2.830***	2.729***	2.639***	2.450***	2.577***	2.819***	2.887***
	0.269	0.284	0.302	0.278	0.285	0.310	0.314	0.305
Observations	758	726	689	720	701	721	690	758
R-squared	0.064	0.068	0.073	0.073	0.068	0.073	0.078	0.065

Data Source:School survey conducted in April-May 2008

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

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

Dependent variable is whether the COGES is responsible for supervising teacher 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 does not vary from small and insignificant (regressions available upon request).

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.

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

Explanatory Variables	Dependent Variable: Opposition: Whether the COGES sanctions teachers for poor attendance							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treatment (T)	-0.0256	0.0461	-0.131	-0.0519	0.0263	0.0395	-0.244	-0.0292
	0.0720	0.0985	0.141	0.0894	0.0872	0.208	0.180	0.264
T*civil servant teachers (%)		-0.0721						
		0.0728						
T*Director Seniority			0.0645					
			0.0744					
T*Education of COGES				0.0556				
				0.0774				
T*Wealth of COGES					0.0802			
					0.0839			
T*HH Distance						-0.0182		
						0.0790		
T*Director same lang							0.0825	
							0.0771	
T* % girls								0.00102
								0.0720
Constant	0.807***	0.760***	0.946***	0.902***	0.919***	1.009***	0.948***	0.809***
	0.274	0.291	0.307	0.293	0.305	0.316	0.320	0.301
Observations	758	726	689	720	701	721	690	758
R-squared	0.049	0.054	0.053	0.046	0.051	0.060	0.057	0.049

Data Source:School survey conducted in April-May 2008

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

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

Dependent variable is whether the COGES ever 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 does not vary from small and insignificant (regressions available upon request).

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.

Table 11: The Impact of Grants on School Quality

	Dependent variable		
	(1)	(2)	(3)
	2008/2009	April/May 2008	April/May 2008
Explanatory Variables	Infrastructure Index	Accountability Index	Teacher Effort Index
Treatment	**0.0414***	0.00973	-0.0235
	0.0236	0.0283	0.0449
Constant	-0.454***	-0.175*	0.113
	0.0936	0.103	0.140
Observations	978	806	829
R-squared	0.164	0.125	0.207

Data Source: Accountability and Teacher Effort Indices: School survey conducted in April-May 2008; Infrastructure Index: 2008-2009 DSI Annual School Census

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

Accountability Index is an unweighted average of the z-scores for using registers for (i) fudnraising, (ii) expenditures, (iii) pupil attendance, (iv) teacher attendance, (v) visitors, (vi) inventory and (vii) activities, the existence of a written school improvement plan and whether minutes were taken at the last COGES and APE meetings (all variables are dummies).

Teacher effort index is the unweighted average of the z-scores for the percent of teachers present at the unannounced survey visit, whether the school was open on the day of the visit, and whether or not the director was present when interviewers arrived at the school.

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.

Table 12: The Impact of Grants on the Demand for Education: Enrollment

Explanatory Variables	Dependent Variable: Reported enrollment in 2008-2009						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Girls	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Total
Treatment	-0.0323	**0.102****	0.0139	-0.0291	0.00131	-0.0385	0.00911
	(0.0469)	**(0.0418)**	(0.0414)	(0.0419)	(0.0427)	(0.0449)	(0.0226)
Constant	0.845***	-0.541**	-0.469***	-0.551***	-0.722***	-0.706***	-0.379***
	(0.199)	(0.211)	(0.181)	(0.174)	(0.186)	(0.229)	(0.137)
Observations	988	988	988	988	988	988	988
R-squared	0.473	0.580	0.591	0.572	0.564	0.524	0.880
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel B: Boys	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Total
Treatment	-0.00646	**0.0945****	-0.0390	-0.0131	0.0239	-0.0189	0.0126
	(0.0494)	**(0.0471)**	(0.0470)	(0.0500)	(0.0483)	(0.0468)	(0.0241)
Constant	1.176***	0.377*	0.663***	0.467**	0.381**	0.406**	0.855***
	(0.201)	(0.203)	(0.192)	(0.191)	(0.188)	(0.176)	(0.141)
Observations	988	988	988	988	988	988	988
R-squared	0.415	0.465	0.471	0.398	0.437	0.480	0.866
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel C: Total	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Total
groupe	-0.0189	**0.103****	-0.0175	-0.0210	0.0160	-0.0292	0.0115
	(0.0470)	**(0.0435)**	(0.0435)	(0.0462)	(0.0446)	(0.0439)	(0.0206)
Constant	1.079***	-0.0332	0.193	0.0600	-0.0609	-0.0559	0.317**
	(0.196)	(0.204)	(0.181)	(0.176)	(0.171)	(0.179)	(0.128)
Observations	988	988	988	988	988	988	988
R-squared	0.470	0.545	0.546	0.484	0.520	0.540	0.901

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 13: The Impact of Grants on the Demand for Education: Dropouts

Explanatory Variables	Dependent Variable: Reported dropouts in spring 2008						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Girls	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Total
Treatment	-0.0649	**-0.181***	-0.0959	-0.100	-0.0664	0.123	-0.0565
	(0.0867)	**(0.105)**	(0.0871)	(0.0950)	(0.0990)	(0.0929)	(0.0733)
Constant	0.485**	1.018**	1.158***	1.397***	1.193**	0.793**	1.093***
	(0.221)	(0.453)	(0.365)	(0.514)	(0.469)	(0.393)	(0.270)
Observations	529	432	525	454	376	449	753
R-squared	0.031	0.061	0.042	0.120	0.063	0.110	0.055
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel B: Boys	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Total
Treatment	**-0.168***	0.0377	-0.112	-0.0501	0.0760	-0.0461	-0.0627
	(0.0935)	(0.109)	(0.0839)	(0.0988)	(0.0981)	(0.0945)	(0.0644)
Constant	0.339	0.588**	0.826***	1.274**	1.213**	0.688**	0.236
	(0.225)	(0.276)	(0.307)	(0.554)	(0.513)	(0.326)	(0.202)
Observations	530	434	524	453	379	463	754
R-squared	0.041	0.043	0.050	0.074	0.063	0.092	0.036
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel C: Total	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Total
groupe	**-0.164***	-0.0661	-0.115	-0.0757	0.0303	0.0131	-0.0639
	(0.0911)	(0.110)	(0.0844)	(0.0975)	(0.0976)	(0.0932)	(0.0640)
Constant	0.440**	0.627**	0.984***	1.388**	1.325**	0.841**	0.257
	(0.220)	(0.297)	(0.348)	(0.555)	(0.522)	(0.363)	(0.204)
Observations	531	434	525	454	381	466	752
R-squared	0.038	0.042	0.046	0.090	0.068	0.104	0.036

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: Channel of the Effect on the Demand for Education: Participation or School Quality?

Explanatory Variables	Dependent Variable: Grade 2 enrollment in 2008-2009			
	(1)	(2)	(3)	(4)
Treatment	**0.0990****	0.0793	**0.0998****	0.0804
	0.0500	0.0516	**0.0502**	0.0517
Participation Index		**0.174****		**0.176****
		0.0730		**0.0729**
Infrastructure Index			-0.0181	-0.0279
			0.0641	0.0631
Constant	-0.299**	-0.280**	-0.305**	-0.288**
	0.133	0.132	0.134	0.133
Observations	735	735	735	735
R-squared	0.556	0.560	0.556	0.560

Data Source:School survey conducted in April-May 2008

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

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

Participation index is the average of the Supportive and Management Participation indices.

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.

Appendix 1: First and Second Derivatives of the Equilibrium Effort

Recall that we restrict the analysis to symetric equilibria where $e_i^* = e_{-i}^* = e^*$. We apply the implicit function theorem to the implicit function of e^* with respect to θ defined by equation (2):

$$b\frac{\partial qQ}{\partial e_i}(e^*, \theta, e^*, f_0, G) - \kappa c'(e^*) = 0$$

which allows us for writing the first partial derivative of e^* with respect to θ:

$$\frac{\partial e^*}{\partial \theta} = -\frac{b\frac{\partial^2 Q}{\partial\theta\partial e_i}(e^*, \theta, e^*, f_0, G)}{b\frac{\partial^2 Q}{\partial e_i^2}(e^*, \theta, e^*, f_0, G) - \kappa c''(e^*)} \tag{9}$$

The second partial derivative of e^* with respect to θ and b is then:

$$\frac{\partial^2 e^*}{\partial b\partial \theta} = \frac{\kappa c''(e^*)}{\left[b\frac{\partial^2 Q}{\partial e_i^2}(e^*, \theta, e^*, f_0, G) - \kappa c''(e^*)\right]^2} \tag{10}$$

The second partial derivative of e^* with respect to θ twice is then:

$$\frac{\partial^2 e^*}{\partial \theta^2} = \frac{b^2\left[\frac{\partial^2 Q}{\partial\theta\partial e_i}(e^*, \theta, e^*, f_0, G)\frac{\partial^3 Q}{\partial\theta\partial e_i^2}(e^*, \theta, e^*, f_0, G) - \frac{\partial^2 Q}{\partial e_i^2}(e^*, \theta, e^*, f_0, G)\frac{\partial^3 Q}{\partial\theta^2\partial e_i}(e^*, \theta, e^*, f_0, G)\right] + b\kappa\frac{\partial^3 Q}{\partial\theta^2\partial e_i}(e^*, \theta, e^*, f_0}{\left[b\frac{\partial^2 Q}{\partial e_i^2}(e^*, \theta, e^*, f_0, G) - \kappa c''(e^*)\right]^2} \tag{11}$$

The second partial derivative of e^* with respect to θ and κ is then:

$$\frac{\partial^2 e^*}{\partial \kappa\partial \theta} = \frac{b\frac{\partial^2 Q}{\partial\theta\partial e_i}(e^*, \theta, e^*, f_0, G)c''(e^*)}{\left[b\frac{\partial^2 Q}{\partial e_i^2}(e^*, \theta, e^*, f_0, G) - \kappa c''(e^*)\right]^2} \tag{12}$$

Finally, the first partial derivative of e^* with respect to G is:

$$\frac{\partial e^*}{\partial G} = -\frac{b\frac{\partial^2 Q}{\partial G\partial e_i}(e^*, \theta, e^*, f_0, G)}{b\frac{\partial^2 Q}{\partial e_i^2}(e^*, \theta, e^*, f_0, G) - \kappa c''(e^*)} \tag{13}$$

Appendix 2: Using the Proportion of Girls at School as a Proxy of Parental Taste for Education

In our model, the demand for education of parent i in a given community is given by the optimal investment in education $S_i* = \frac{\beta_i r + \alpha_i - f}{d}$, where β_i is parent i's patience, r is the return to education in the community, α_i is parent i' taste for education, and f and d reflect the cost of education.

Let's aggregate the demand for education at the community level: $S_c* = \frac{\beta_c r_c + \alpha_c - f_c}{d_c}$, where β_c is parents' aggregate patience, r_c is the return to education, α_c is parents' aggregate taste for education, and f_c and d_c reflect the cost of education in community c. Let's now consider three types of differences:

- Differences in demand for education for boys and girls in a given community would come from differences in either parents' patience towards future income of boys and girls, taste for education for boys and girls, returns to education for boys and girls, or cost of education for boys and girls. This will result in a proportion of girls at school different than 0.5.

- Differences in demand for education across communities would come from differences in either parents' patience towards future income, taste for education, returns to education, or cost of education across communities.

- Differences in proportion of girls at school across communities would come from a combination of variations in those two dimensions: differences across communities in the differences across sex in patience towards future income, taste for education, returns to education, or cost of education.

To use the proportion of girls at school as a proxy of parental taste for education in the community, we use two assumptions:

- The first assumption is that parents' patience towards future income is the same regardless the sex of the child.

- The second assumption is that there is no community pattern in the difference in return to education (resp. cost of education) between boys and girls: there can be differences in return to education (resp. cost of education) between girls and boys, as well as differences in return to education (resp. cost of education) between communities, but not community pattern in gender differences.

The idea behind the second assumption is that boys and girls might be discriminated on some factors influencing return to/cost of education - like safety when they go to school, or future wages on the job market, and that communities might differ along those aspects with some communities being safer or offering higher wages than others; but the gender discrimination regarding safety/wages does not vary with the level of safety/wages.

In contrast, the gender discrimination regarding the direct utility of having one's child educated varies with the level of direct utility of having one's child educated, due to the fact that those factors which reduce gender discrimination (religion, culture, women empowerment) generally increase taste for education at the same time. As a result, the difference in proportion of girls at school across communities reflect the difference in difference in the direct utility of having one's girl educated and the direct utility of having one's boy educated across communities, which reflects difference in taste for education across communities.

Appendix 3: 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[25].

Data from the qualitative questionnaire administered to the 85 randomly selected schools indicate that the majority of those schools received the intended grant amount[26].

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[25]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.

[26]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 4: 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 five indices based on the insights from the model:

- Two indices reflecting different kinds of parent participation:

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

  - The *management* index averages together seven variables reflecting parents and school committee involvement in actions that imply taking some responsibility for school management: 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.

- Three indices 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).

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.

The data on infrastructure comes from the 2008/2009 annual administrative database so we can evaluate the impact of the grant in the middle run (around 10 months after the treatment).

– The accountability index is composed of a dummy for the existence of a written school action plan, and registers for material inventory, pupil attendance, inspector visits, weekly activities, fee collection, fee expenditure, and teacher attendance. The data for this index comes from the April/may 2008 questionnaire so unfortunately we measure the short term impact of grants on accountability (around 5 months after the treatment).

– The teacher effort index is composed of the percent of teachers present on the day of the unannounced visit, a dummy indicating whether the director was at the school when the survey team arrived, and a dummy for whether the school was open on the day of the visit. For this index, the data comes also from the April/may 2008 questionnaire so we evaluate the short term impact of grants on accountability (around 5 months after the treatment).

Appendix 5: Descriptive Statistics

Community Characteristics

Table 2 shows descriptive statistics on the community characteristics 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.

The proportion of pupils who are girls is on average 39%. The standard deviation is 0.11, which indicates some heterogeneity across communities. 10% of schools have a proportion of girls below 23%, whereas 10% have a proportion of girls above 50%.

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.

The average distance index is 1.2, meaning that the typical community lives almost entirely

within 3 km from school (in 77% of schools, all students living within 3 km of the school). One-fifth (20%) of schools have a significant share of students living more than 3 km from school, indicating a sparse population. Note that pupils in the control schools tend to be closer to the community than pupils in the treatment schools (significant at the 10% level), although this difference is very small.

There is therefore heterogeneity in these characteristics across communities, which will help to identify the circumstances under which community participation to school monitoring works. The heterogeneity is limited: the context of this study is characterized by low real authority of the parents (low education and wealth) and rather high social proximity between the provider and the community (teachers most often speak the same language as the majority of the population).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.

Accountability and Transparency   While most schools claim to keep registers for fundraising and expenses, only about half were actually able to produce registers to be seen by the interviewers. Over half of schools, 59% of school committees and 52% of parent associations, took minutes in the last meeting. The annual school improvement plan, seen by many as the key activity of the school committees, was able to be produced for inspection in 48% of schools. Recordkeeping varies substantial by subject matter: 89% of schools use a register for material inventory, 71% to record pupil attendance, and 52% for inspector's visits, whereas only 22% use a register to record weekly activities and 17% use a register to record teacher attendance.

Teacher Effort   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 18% of teachers were absent.[27] 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 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,

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[27] 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.

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.