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Election, Implementation, and Social Capital in School-Based Management: Evidence from a Randomized Field Experiment on the COGES Project in Burkina Faso

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Abstract

In this paper, we investigate the role of School Management Committees (COGES) in Burkina Faso. These committees include elected members of each community, and are tasked with setting and implementing annual school plans. The study adopted a hybrid evaluation method incorporating a randomized controlled trial and a large-scale artefactual field experiment a la Levitt and List (2007) on public goods with monetary rewards, to closely examine unexplored issues impacting on the sustainability of community-driven projects, and to identify at least partially the mechanisms of this sustainability. We found that the COGES project significantly increased social capital in the form of voluntary contributions to public goods, especially by linking those that people can be connected to vertically. On average, the direct increase in voluntary contributions to public goods from the implementation of the COGES project was between 8.0 and 10.2%. For groups composed of school principals, teachers, and parents, the average contribution increased by between 12.7 and 24.1% through the democratic election of school management committee members, and by between 11.0 and 17.2% through the implementation of the COGES project. These results suggest that community management projects can improve local cost recovery by increasing local contributions of public goods, potentially leading to better fiscal sustainability in community-driven projects. Moreover, the results based on our hybrid experiments are largely in line with real-world decisions observed in the schools under our investigation. As a byproduct, our findings are supportive of models of other-regarding preferences.

Keywords: school-based management; randomized controlled trials; artefactual field experiments; public goods game; social capital; sustainability of development project

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1. Introduction

To achieve universal primary education in developing countries, a variety of policy interventions have been proposed in relation to both supply and demand. These have ranged from the expansion and improvement of school infrastructure to de-worming students, information sharing, free school lunches, free school uniforms and conditional cash transfers (Kremer 2003; Miguel and Kremer 2004; Jensen 2010; Duflo and Kremer 2003; Banerjee and Duflo 2006; Duflo, Glennerster, and Kremer 2008; Glewwe 2002; Kazianga et al. 2016). Policy-makers and researchers also regard School-Based Management (SBM), which is defined as a particular form of decentralization of various decision-making powers and forms of budgetary control from the central government to the school level, as one of the key instruments to deliver effective educational services (Barrera-Osorio, Fasih, and Patrinos 2009; Westhorp et al. 2014). However, understanding of the estimated policy effects of SBM on various outcomes is still mixed. While a set of studies has found positive impacts of SBM (Barrera-Osorio et al. 2009; Gertler et al. 2006; 2007; Blimbo, Evans, and Lahire 2011; Bruns, Filmer, and Patrinos 2011; Pradhan et al. 2011; Duflo, Dupas, and Kremer 2015), other studies report negligible impacts from SBM (Banerjee et al. 2010; De Laat, Kremer, and Vermeersch 2008; Kremer and Holla 2009).

An important related issue in developing countries is the sustainability of the voluntary provision of local public goods such as educational services, school buildings and other infrastructure at local schools, which are to some extent characterized by non-rivalry and non-excludability within each school or community. Normally, the amount of these local public goods that is provided voluntarily will be too low. While governments can often correct this type of market failure, their own

failures in developing countries are also fairly common. To tackle the fundamental failure of both the market and the government in providing such services, international development strategies designed to deliver local public goods have shifted from top-down central government driven strategies to decentralization strategies under which budgets and decisions are delegated to local communities and other stakeholders to sustainably provide their own public goods in the last few decades (Miguel and Kremer 2007). The hope is that bringing decision-making power and accountability closer to those who benefit will make the service delivery system more efficient, effective, and sustainable (Mansuri and Rao 2013). In fact, development policy makers and researchers also argue that the quality of local public goods will improve when such delivery is governed by an autonomous entity involving local beneficiaries (Bardhan 2002; 2004; Bardhan and Mookherjee 2005). While this reasoning is compelling, actual evidence on the effectiveness of decentralized public projects is only now beginning to emerge. This is partly due to the difficulty in designing and implementing rigorous evaluations of the decentralization policies designed to facilitate the voluntary provision of public goods in a community. In a set of small-scale interventions of this type in Kenya, Kremer and Miguel (2007) found that a number of interventions, such as local cost-sharing and verbal commitments, were all ineffective, and concluded that it may be difficult for a onetime infusion of external assistance to promote the sustainable voluntary provision of most local public goods. However, it is still important to raise the question of whether indirect interventions such as the formation of user committees, under which the government delegates various decisions rights to local communities, can be effective in delivering social services in rural developing countries.

This paper aims at filling part of the gaps in the existing understanding by rigorously evaluating an SBM program in the elementary education sector of Burkina Faso called the *Comites de Gestion dans des Ecoles Primaires* (COGES) project. In COGES schools, the school management committees, which include elected members from each community, set and implement annual school plans. To evaluate this program rigorously, we adopted a hybrid evaluation method of a randomized controlled trial and combined this with a large-scale artefactual field experiment *a la* Levitt and List (2007) on public good contributions with monetary rewards, to examine unexplored issues relating to the sustainability of the voluntary provision of these goods closely, and to at least partially identify the mechanisms involved.

There are three novel aspects of our study. First, we provide the first evidence on an SBM program *per se*, as opposed to existing studies which investigate sub-components of SBM programs (Pradhan et al. 2014; Barr et al. 2012; Beasley and Huillery 2012; Blimpo, Evans, and Lahire 2013). Because there are still only a few rigorous evaluations of SBM in lower income communities (Westhorp et al. 2014), we believe we can make an important contribution to the understanding of these processes. Second, we adopt a hybrid evaluation method to undertake a randomized controlled trial of the COGES project itself, plus an artefactual field experiment on the voluntary provision of public goods (Levitt and List 2009). Such an evaluation strategy allows us to closely examine unexplored issues involved in the sustainability of the voluntary provision of local public goods. Third, while our evaluation places a particular focus on the reduced-form causal impacts of SBM on social capital in the form of voluntary contribution to public goods (Anderson et al. 2004), we also partially identify the mechanisms by utilizing the timing of different components of the intervention and panel structure of our hybrid experimental data. More specifically, we estimate the differentiated treatment effect in each of the

project phases; one impact for the direct effects of SBM elections, and the other impact for the project implementation itself.

To preview our results, we found that the COGES project increased social capital significantly. In the villages treated with the COGES project, the average amount of voluntary contributions to public goods increased by 8 to 10.2%. Most of this effect can be explained directly by the implementation of the COGES project. However, for groups composed of a school principal, a teacher, and parents, the average contribution increased by 12.7 to 24.1% through a village-wide democratic election of the SBM, and by 11 to 17.2% through the implementation of the COGES project. These results suggest that community managed projects appear to enable significant local cost recovery, potentially leading to better fiscal sustainability for a community-driven project. Moreover, we also found that the results from our field experiment are largely consistent with the real-world decisions that we observe in the schools. As a byproduct, our findings are supportive of models of other-regarding preferences, such as altruism, trust, and social norms.

The remainder of this paper is organized as follows. In Section 2, we explain basic features of the COGES project as well as our hybrid experimental strategies. Section 3 gives our estimation results, and is followed by the final section with our concluding remarks.

2. A COGES Project Experiment

Background

Burkina Faso lags behind much of the rest of the world in achieving universal primary education.[1] To address this deficiency, the government of Burkina Faso

[1] The education system of Burkina Faso comprises three years of preschool, six years of primary, four years of lower secondary, and three years of upper secondary education,

adopted a Poverty Reduction Strategy in 2000, stating that one of the most important goals of this strategy is to "guarantee that the poor have access to basic social services." To achieve this goal, the Ministry of Basic Education and Literacy (hereafter MEBA) drew up a Basic Education Ten-Year Development Plan (hereafter PDDEB), which was divided into Phase I (2000-2006) and Phase II (2007-2010).[2] In the latter phase, strong emphasis was placed on improving the quality of basic education by decentralizing the education system. During Phase II, a presidential decree of July 2007 mandated tuition-free primary and lower middle education. The government also adopted the Education Policy Law (Lettre de politique educative) in July 2008 to specify concrete strategies to achieve the MDGs in the education sector. In the decentralization process, each district was divided into the lowest administrative levels for basic education or Circonscription d'education de base (hereafter CEB). Each CEB has an office, staffed with inspectors to facilitate teacher training programs overseeing 13 to 14 elementary schools on average. In 2009, the government issued a decree (2009-106) to delegate the right to manage infrastructure in preschool, basic education, and literacy programs to the CEB.

Since the initiation of PDDEB, enrollment at public primary schools has increased by 9.7% annually, but the discrepancies between boys and girls have actually been widening, especially in poorer regions. Moreover, dropouts and grade repetitions are still major constraints to achieving universal completion of a full course of primary schooling. To tackle these problems, the government enacted a decree to initiate Comité de Gestion de l'Ecole (hereafter, COGES) in May 2008. In 2009, with technical assistance from the Japan International Cooperation Agency, MEBA started the "School for All" project or, more formally, "Support for the

followed by tertiary education. Multi-grade classrooms are also common, especially in rural schools.

[2] MEBA refers to Ministere de l'Enseignement de Base et de l'Alphabetisation in French. PDDEB refers to Plan decennal de developpement de l'education de base in French.

Improvement of School Management through a Community Participation Project" to improve the quality of basic education in Burkina Faso. Hereafter, we call this project the "COGES project."[3]

The COGES Project

COGES basically involves setting up a management committee in each primary school whose members are democratically elected from among the parents of the students and community members. Although Parents' Associations (APE) and Mothers' Associations (AME) among parents of students have existed as school councils in Burkina Faso since the 1960s, they have had limited roles in actual school management. In order to involve community stakeholders in school management in an attempt to improve child education, health, and nutrition, and to empower parents and community members, the government issued a decree to establish new school committees, i.e., COGES, in 2008. While a COGES has a central role in setting and implementing an annual school action plan, a distinctive feature of the intervention of the project was the introduction of a democratic election by a secret ballot of all community members to select new members, in addition to the members already defined by the decree such as the Mayor, the Presidents of APE and AME, the school principal, representatives of teachers, NGOs and teacher unions. These new members include the COGES president and persons in charge of community participation, girls' enrollment, monitoring, accounting, and auditing. The rationale for democratic election was to build confidence among the community members by making a COGES transparent and representative of the community.

[3] Officially, the COGES project is called PACOGES (projet d'appui aux comités de gestion des écoles).

After the election, the COGES proceeded to organize a series of community meetings in which any community members within the school district could participate. The agenda of the first meeting was to discuss problems facing the school and, based on the discussion, to make an action plan to be implemented during the subsequent school year. A second meeting was then held to discuss and approve the action plan. Typical action plans included things like constructing and repairing school facilities, such as classrooms, desks, chairs, and separate toilets for female students, providing school lunch for students, providing housing for teachers, and purchasing learning materials for students. Because most of the schools could not expect external resources, a COGES could also mobilize financial and non-financial resources within the community in order to implement the school action plan. A third meeting was held to monitor the implementation of the action plan, and a fourth meeting evaluated the activities implemented by the COGES in the previous year. The same cycle is repeated every year: at the beginning of the new school year, with the COGES and the community members making a new action plan for the year, including a plan to implement, monitor, and evaluate the action plan using their own resources.

RCT-Based Evaluation

To rigorously assess the causal effect of the COGES project intervention, we conducted a randomized controlled trial (RCT) in the form of a randomized "roll-out" of the COGES project in all elementary schools in the Ganzougou Province, Burkina Faso. Utilizing a list of all schools in the province provided by Ministry of Basic Education and Literacy, we first partitioned a total of 279 schools in the province into 30 strata within 10 educational districts (CEB) and three school types; public schools, private Islamic schools, and private Catholic schools (Table 1). Using

random assignment within each stratum, 141 schools were grouped into first-year COGES schools (1st year treatment schools), where the COGES project was in place during the 2009/2010 academic year, and the other 138 schools were grouped into second-year COGES schools (1st year control schools), in which the schools had received a delayed treatment of the COGES project during the following 2010/2011 academic year. During data collection, we discovered that some schools actually did not exist or had been closed, which reduced the number of the schools to 134 and 132 for the 1st year treatment and control groups, respectively.

We conducted a series of surveys with carefully-designed questionnaires to all the major stakeholders in the school: the school principal, a randomly selected teacher from each grade, five randomly selected students of each randomly selected teacher, and the household head of each of the five randomly selected students. The first-round baseline and second-round endline surveys were conducted in December 2009/January 2010 and in January/February 2011, respectively. For the artefactual field experiments described below, we first randomly selected subsets of the schools in first-year and second-year COGES schools, and then recruited participants within the schools belonging to different groups, such as COGES members, teachers, parents, and so on. At the baseline field experiment in February 2010, there were 43 and 40 schools in the first-year and second-year COGES lists, respectively. At the endline experiments in November/December 2010, there were 21 first-year and 21 second-year COGES schools. Table 2 reports on the test results of pre-treatment balance in observables across interventions on subjects of artefactual field experiments using the baseline dataset. The results indicate that we cannot reject the null hypothesis of no mean differences in the pre-treatment covariates between these two groups.

The Sequence of the COGES Project

To help facilitate the COGES election and the development and implementation of the action plan, several types of training were conducted for stakeholders. The sequence of training is described in Figure 1. First, in order to establish the system the school principals in the first-year COGES schools attended two days of training in January 2010 on how to organize community meetings and hold elections. After returning home, there were then two community meetings held in the same month: the first for sharing information about the upcoming COGES, and the second for the actual election of COGES members. After the election, the school principals, the COGES president and accountant, and representatives from the municipal offices participated in an additional two days of training on making an action plan including its implementation, monitoring and evaluation. These events were followed by actual implementation and monitoring of the school activities developed in the action plan. Because the project was designed as a randomized roll-out project, it provided the same sequence of training and elections for the second-year COGES schools starting from November 2010.

A Hybrid Experiment

We adopted a hybrid evaluation method of randomized controlled trials, combined with artefactual field experiments in which we conduct a public goods game with the school principal, teachers, parents, and elected COGES members. Specifically, we conducted the baseline public goods games in February 2010 after the election of the first-year COGES schools. The endline public goods experiments were conducted in November/December 2010, after the elections for the second-year COGES schools

(Figure 1).[4] The public goods game is one of the standard laboratory experiments used to measure voluntary cooperation among subjects (Levitt and Fehr 2004; Camerer and Fehr 2004; Cardenas and Carpenter 2008) and is regarded as a way to elicit a measure of social capital (Anderson et al. 2004).

In our public goods games, each participant is placed in a group containing N unanonymous members and given an initial endowment, E. Each participant in each group has to decide the amount Y_i of their endowment to secretly contribute to the public good. The contributions are then totaled and multiplied by a factor ρ, where $1<\rho<N$ is chosen by the experimenter, and then divided equally among the group members. The group members do not observe the contributions of the other members but only the amount returned to them. The final payoff for each group member is therefore:

$$\pi_i = \left(E - Y_i\right) + \frac{\rho}{N}\sum_{i=1}^{N} Y_i \,. \qquad (1)$$

Note that $\partial\pi_i/\partial Y_i=-1+(\rho/N)<0$ when $1<\rho<N$. Since the zero-contribution strategy $Y_i=0$ is a dominant strategy, a pure-strategy Nash equilibrium is $Y_i=0$ for all i. The actual amount Y_i represents the deviation from the individually rational Nash equilibrium and we can interpret Y_i as a measure of a participant's propensity for voluntary cooperation.

In our actual experiments, we designated groups of four members (N=4), and set an initial endowment of 500 FCFA (E=500 FCFA).[5] We also set $\rho=2$ and so

[4] One of the reasons for setting this timing is in that we needed elected COGES member information form COGES member groups for the experiments.

[5] 1 US dollar was equivalent to 602 FCFA on January 21, 2016. FCFA refers to the Franc Communauté Financière Africaine, which is a currency backed by the French Treasury and used in Burkina Faso and many other West African Francophone countries. To understand

doubled the collected amount before dividing it among the four participants. In forming groups of four members, we set five group types: groups composed of the parents of students either four fathers (Group 1) or four mothers (Group 2); four men or four women from the community (village) who do not send children to the school (Group 3);[6] a school principal, one teacher, one father, and one mother (Group 4); and four elected COGES members (Group 5). Also, we asked each participant to play the public goods game twice with an immediate monetary reward from the game in each round. This was to examine, at least partially, the observed patterns in the existing laboratory experiments in which after playing repeatedly, provision of the public good declines toward the free riding level, i.e., the Nash equilibrium, with each repetition regardless of information about the length of the game beforehand (Andreoni 1988).

The public goods game is a generalization of the prisoner's dilemma game in that *N* group members decide simultaneously how much to invest in the public good. Hence, the invested amount, which is the deviation from the Nash equilibrium, can be interpreted as social capital in the form of conditional reciprocity, i.e., reciprocated expected cooperation (Anderson et al. 2004; Levitt and List 2005; Carmerer et al. 2009). However, a voluntary contribution in the public goods game may be influenced by the degree of altruism rather than a voluntary contribution to public goods. To separate the effect of pure altruism, we followed Anderson et al. (1998) in considering its role in facilitating voluntary contribution to public goods,

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the magnitude of these transfers note that the official minimum wage rate in Burkina Faso is 1,050 FCFA per day. However, it is common to set a daily wage rate at 300 to 500 FCFA in rural agricultural and urban service sectors. So keeping the entire transfer and contributing nothing would be the equivalent of approximately one day of work for many individuals in our sample The average payout was 1600.581 FCFA (1st round: 784.2 FCFA, 2nd round: 812.7 FCFA) for the first year, and 1655.5 FCFA (1st round: 815.3 FCFA, 2nd round: 837.3 FCFA) for the second year.

[6] If the school id was an odd (even) number, we chose four men (women).

and used the results from a dictator game to control for the effects arising from altruism.

The dictator game is conducted as a hypothetical question without monetary incentives. Initially, each participant is matched by another person randomly chosen from the same experimental session in an anonymous setting. The participant is then asked for the amount of transfers without a repayment obligation out of the initial endowment of 500 FCFA from the list of possible transfers, {0, 100, 200, 300, 400, 500 FCFA}. Since there is no self-interested reason for the sender to transfer money, the actual positive amount of transfer is usually interpreted as the level of altruism, although other potential interpretations, such as self-image construction, are possible (Camerer and Fehr 2004; Levitt and List 2007).

The Econometric Model

We estimate the impacts of the COGES project on the level of social capital Y as measured by the voluntary contributions made in the public goods game. Because the COGES project involved a particular sequence of interventions, experiments and data collection, the timing of events is important for interpreting what is being identified in the econometric model. Note that we first conducted the public goods experiments in February 2010 right after the COGES elections in the first-year COGES schools. The second round of public goods experiments were then conducted in November/December 2010 after the elections for the second-year COGES schools (Figure 1). Table 3 gives the summary statistics of “before” and “after” data.

Therefore, our data from the public goods games can be classified into four cases as is shown in Table 4. If we employ the “before” data collected in February 2010, the outcome difference between the first-year and second-year COGES schools, i.e., $Y_{1b} - Y_{2b}$, identifies the impact of the COGES election. This is because

while the election had occurred in the first year COGES schools (i.e., the 1st year treated schools), it had not occurred in the 2nd year COGES schools (i.e., the 1st year control schools). Thus, the COGES project had yet to be implemented in either the treated or the control schools. We call this the "election effect," which is defined as an immediate direct impact arising from the election. With the "after" data from November/December 2010, the outcome difference between the first-year and second-year COGES schools, i.e., $Y_{1a} - Y_{2a}$, shows the impact of the implementation of the COGES action plan in the first-year COGES schools. This is because the 2nd year schools had then been exposed to the election, while the 1st year schools had been exposed to both the election and to the implementation of the school action plan. We call this the "implementation effect," which is defined as the accumulated impact of the COGES implementation net of the direct election effect.[7] The total impact of the COGES project can then be quantified by aggregating the election and the implementation effects. Note that the conventional difference-in-difference estimator captures the difference between these two effects.

We use the following linear regression model to quantify the Average Treatment Effects on the Treated (ATT) of the COGES project on the level of social capital *Y*:

$$Y_{it} = \alpha + \beta D_i + X_{it}\gamma + u_{it}, \qquad (2)$$

[7] An additional possibility is that there is "fade-out" of the "before" data election effects. In this case the "after" data impacts are estimating the difference between the implement effect in the first year COGES schools and the presumably zero or positive election effect in second year COGES schools. In this situation the "after" data impact serves as a lower bound on the true implement effect because it nets out the election effect. However, in our empirical results the election effects are mostly zero in the 1st year COGES schools, so if the second year schools also have a zero election effect then the "after" data impact identifies the implementation effect.

where t=1st year or 2nd year; the binary treatment variable D takes the value of one if a COGES project is implemented during the first year and zero otherwise; i stands for an individual and β represents ATT; and X is a set of covariates.

Note that when t is the first year, the treatment effect β can be interpreted as the effect generated by the election. Alternatively, when t is the second year, the treatment effect β can be interpreted as the effect generated by the implementation of the project net of the direct election effect (Table 3). Given the nature of our RCT intervention, we can impose the assumption of ignorance: $E(Y^{D=0}|D=1) = E(Y^{D=0}|D=0)$. We therefore show the estimation results with and without a set of covariates, X, because inclusion of these covariates can help increase the precision of the estimate. Since 8 of the 43 first-year COGES schools did not conduct COGES projects due to their slow project adoption speed, and 3 schools out of the 40 assigned to the list of second-year COGES schools were "crossovers" and had implemented a COGES-like project during the first year, we estimated equation (2) using random treatment assignment as an instrumental variable. In doing so, we identified the treatment effect on the subpopulation of compliers, i.e., the local average treatment effect (LATE) of Imbens and Angrist (1994).

3. Estimation Results

Tables 5 summarizes the estimation results of the election and implementation effects under homogenous treatment effects. Note that each participant plays the public goods game twice, so we report the estimation results from the combined contributions from the two rounds of the game. In the first three specifications of Table 5, we estimate equation (2) using the first year data, which captures the direct election effect, and shows that the coefficients on the treatment variable, D, are all

insignificant. This indicates that a community-wide democratic election itself does not necessarily stimulate voluntary contributions by community members. In contrast, when we estimate equation (1) using second year data to identify the effects of implementing the COGES action on voluntary contributions, the estimated impacts are consistently positive and statistically significant, as we can see from specifications of (4), (5), and (6) of Table 5. With the implementation of the COGES project, the average amount of voluntary contributions to public goods increased by 8.0 to 10.2%. Moreover, as we can see from all specifications, the second round public goods game stimulates a significantly larger amount of voluntary contribution to the public goods than the first round. Since this finding in relation to the publicly-announced fixed ending time of the game is not necessarily in conflict with theoretical possibilities of learning about free-riding or voluntary contribution arising from an infinitely repeated game (Andreoni 1988), our results may be driven by social norms or other-regarding preferences, such as altruism and trust. Indeed, we find that adding our measure of altruism captured by the amount sent in the dictator game to the regression helps explain a significant proportion of the amount of voluntary contribution [specifications (3) and (6)].[8] Table 6 shows the results of intention-to-treat (ITT) effects based on the reduced form equation, with the random assignment of COGES schools as an independent variable. While the point estimates become slightly smaller, the qualitative results are comparable.

Because estimation with a homogenous treatment effect assumption may mask important heterogeneity, we explored the heterogeneous treatment effects by estimating equation (2) on the five different subgroups that played the public goods game. Table 7 shows the estimation results with heterogeneous treatment effects for

[8] Yet we should note that, unlike Andreoni (1988), in which the experimenter let the first played game give them a payoff, the experiment participants of our public goods game did not observe the payoffs until after they finished playing. So even though they played twice, we may interpret that they only played once in some senses.

each group. In a result of particular interest, we found that the estimated treatment effect for group 4, composed of the school principal, a teacher, and two parents, is positive and statistically significant for all the specifications. These point estimates indicate that in this group, the average contribution increased by 12.7 to 24.1% from the democratic election effect of COGES members, and by an additional 11 to 17.2% through the implementation of the COGES project. In specifications (4), (5), and (6), the estimated treatment effects for group 5 are positive and significant as well, indicating the elected COGES members also show strong contributions to public goods.[9] To check the robustness of the results reported in Tables 6, 7, and 8, we used the data to estimate a difference-in-difference model, treating the panel data as repeated cross-section data. Table 8 reports these estimation results, which are comparable to the other results in Tables 6, 7, and 8.

These results indicate that the COGES project increased social capital extensively, especially the linking social capital of Szereter and Woolcock (2004), in which people can be connected vertically.[10] Yet, it is not possible to tell so far whether the differential estimates are driven by a compositional effect - the groups comprise different types of people, who would play the game differently no matter who they played with - or a relational effect, where the game, when played among such a mixed group, captures effects on relational capital. This is an important point. In order to at least partially disentangle a composition effect from a relational effect, we estimated a model with interaction terms using a group 4 dummy variable with indicator data from fathers, mothers, teachers, and school directors. Table 9 shows

[9] However, we cannot distinguish the effects arising from selection of motivated COGES members or enhanced motivation through the implementation of the COGES project.

[10] Szereter and Woolcock (2004) define linking social capital as norms of respect and networks of trusting relationships between people who are interacting across explicit, formal, or institutionalized power or authority gradients in society.

that, within group 4, fathers show a disproportionately positive and significant election effect. In contrast, mothers show a strong implementation effect.

In any event, these results suggest that community management projects may improve local cost recovery by increasing an individual's willingness to contribution to public goods. This, in turn, could lead to better fiscal sustainability in community-driven projects. The overall point estimate of the experimental evaluation of the COGES project impact is consistent with a preceding quasi-experimental study of the COGES pilot project conducted in Burkina Faso by Sawada and Ishii (2012). This study used data from 248 public goods game participants from 7 COGES schools and 5 non-COGES schools in Oubritenga province; finding a 16 to 27% increase in the amount of voluntary contribution to public goods from the introduction of the COGES project. In addition, the overall qualitative results may be seen as being in line with the comparison of four interventions in Indonesia by Pradhan et al. (2013), which found that the democratic election of school management committee members had been effective in raising awareness of the school committee, parental supports, and teacher efforts.

Real World Decisions

Although the public goods game experiment allows a precise measure of an outcome of interest that is comparable across studies, it is perhaps somewhat artificial for the villagers. We therefore also checked the consistency of our public goods game results using some complimentary data we had on villagers' real world behavior derived from the school director and the project record data. We did this by estimating the treatment effects of the COGES project implementation on a variety of real-world outcomes using a canonical difference-in-difference model, using school-level panel data relating to the period before and after the election and

implementation of the COGES project. From the school director data, we employed the following variables as outcomes: (1) an amount of school fee paid per year in FCFA (Tuition Fee); annual textbook costs per student or family (Textbook Fee); an amount of annual financial contributions to the school (Financial Contribution); an indicator variable for provision of school meals (School Meal): the frequency of school meals per month (Meal Frequency); and the availability of functional toilets and latrines in a school (Functional Toilet). The estimation results of real world decisions are summarized in Tables 10 and 11. According to Table 10, which is based on the school principal module data, the COGES program increases the amount of tuition fee payments as well as the availability of school meals. For these two variables, at least, the experimental results are consistent with real world behavior.

Table 11 gives the estimation results of the COGES program effects using the number of school projects and the amount of COGES activity budget extracted from project report data. Since we have the midline and endline panel information, but not the baseline information, at each school, we can adopt a variant of the difference-in-difference model. As to the number of projects, the COGES treatment generates 3.3 school projects on average. The annual school budget also increases after launching a COGES program: we therefore reject the null hypothesis of the non-existence of the COGES effect, and the magnitude of the result is FCFA108,500 (around 180 USD) on average. Yet, the COGES does not include direct monetary transfers from the government, making a conventional cost-benefit analysis difficult in a real world setting.

An additional piece of supporting evidence comes from a complimentary paper by Todo et al. (2016). Using the same dataset as ours, they found that the COGES project stimulated the increased use of rotating savings and credit associations (ROSCAs, also called Tontine in Burkina Faso), which requires social

cohesion to self-select reliable participants and enable mutual monitoring, reducing the risk of defection and increased repayment rates (Zeller 1998; Armendáirz and Morduch 2010). This indicates that the COGES program might have generated the real-world facilitation of voluntary contributions to public goods in a broader sense.

4. Concluding Remarks

In Burkina Faso, market underdevelopment is serious obstacle to economic development, and the country has a very low ranking in terms of political rights and civil liberties (Freedom House 2009). In such an environment, it is invaluable to be able to evaluate precisely the impact of democratic policies on public behavior, and to understand the process of social capital accumulation, which corrects both market and government failures (Hayami 2009; Mansuri and Rao 2013). To fulfill this aim, we investigated the role of COGES in facilitating voluntary contributions to public goods among community members and teachers. By adopting a hybrid evaluation method of a randomized controlled trial and an artefactual field experiment, we could closely examine many unexplored issues related to the sustainability of the voluntary provision of local public goods, and partially identify the mechanisms of such provision. We found that the COGES project significantly increased social capital. With the implementation of the COGES project, the amount of people's voluntary contribution to public goods increased significantly. Most of the impact can be explained by the COGES project implementation itself, although for some groups connected by linking social capital, the effects were both more pronounced and existed for both the implementation and the election of COGES members. This effect was especially pronounced in groups having the vertical linking social capital that connects individuals with different levels of power within a community. The

results suggest that community management projects would seem to have the potential to improve local cost recovery through increasing the voluntary provision of public goods, leading to better fiscal sustainability. These findings are supported by complementary studies of real world decision making. Also, a companion paper by Kozuka et al. (2016) found that the COGES program in Burkina Faso increased student enrolment, decreased repetition, and decreased teacher absence. We believe that this is an important practical finding that can identify the key factors in promoting a democratization process in a country with otherwise weak governance structures.

From these findings, we can also derive broader implications regarding the role of the local community in developing countries where market mechanisms for resource allocation are generally underdeveloped. In fact, market failures become a serious binding constraint for education, because human capital is characterized by specific investment decisions under uncertainty, irreversibility, externalities, and long gestation periods. To correct such market failures, governments often provide other mechanisms to force people to adjust their resource allocations. However, the government itself can also fail, especially in developing countries, because politicians and bureaucrats pursue their own objectives. In contrast, the community is a mechanism that uses social capital to help promote voluntary cooperation, which in turn can facilitate the supply of local public goods. Social capital thus plays a critical complementary role in correcting both market and government failures (Hayami 2009). In fact, the complementarity between the market and social capital is highlighted by the public goods game adopted in this study, because it is a version of the prisoner's dilemma game in which the profit-seeking behavior of self-interested group members leads to a socially sub-optimal outcome or non-Pareto efficient Nash equilibrium. This is a canonical example of the market failure that occurs where

laissez faire approaches cannot achieve an efficient outcome. In the public goods game, the level of voluntary contributions to public goods is defined as the extent to which the observed outcome deviates away from the socially inefficient Nash equilibrium towards the socially optimal. In other words, the contribution level elicited by the public goods game captures the complementarity between market mechanisms and community-based social capital. Our empirical results indicate that such a complementarity can be strengthened by an SBM project.

In future studies, the external validity of our findings should be carefully examined. Although results from the pilot study of Sawada and Ishii (2012), and a study on Indonesia by Pradhan et al. (2013) found results consistent with ours, further external validation is necessary. Given that JICA has been supporting other COGES projects in West Africa (Niger, 2004-; Senegal, 2007-; and Mali, 2008-), careful investigation of the effectiveness of the program in these countries would generate important evidence on SBM projects.

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Table 1. Number of schools

	Second-Year COGES Schools (Control Group)				First-Year COGES Schools (Treatment Group)			
CEB	Public	Private	Franco Arab	Total	Public	Private	Franco Arab	Total
Boudry I	14	0	3	17	14	0	2	16
Boudry II	11	0	7	18	12	0	8	20
Kogho	6	0	0	6	6	0	0	6
Meguet	11	0	0	11	11	0	1	12
Mogtedo	16	1	7	24	16	2	7	25
Salogo	7	0	0	7	6	0	1	7
Zam	13	0	3	16	14	1	3	18
Zorgho I	13	0	3	16	12	0	2	14
Zorgho II	7	1	0	8	7	0	1	8
Zoungou	7	0	2	9	8	0	3	11
Total	105	2	25	132	106	3	28	137

Table 2. Tests of pre-treatment balance in observables across interventions

	The second-year COGES (control)		The first-year COGES (treatment)		*t*-statistics for the null hypothesis of the same mean
	Observations	Mean	Observations	Mean	
Panel A: All Sample					
Age	321	40.277	302	38.877	1.223
Male dummy	321	0.533	302	0.543	-0.258
Years of schooling	321	2.109	302	2.232	-0.382
Director dummy	321	0.044	302	0.046	-0.165
Teacher dummy	321	0.053	302	0.053	-0.001
AME dummy	321	0.031	302	0.033	-0.138
APE dummy	321	0.047	302	0.053	-0.358
Mobile phone dummy	321	0.327	302	0.275	1.420
Dictator game	321	2.637	302	2.631	0.075
Panel B: Only for the Schools in both 2009 and 2010					
Age	185	40.357	202	38.485	1.326
Male dummy	185	0.546	202	0.545	0.027
Years of schooling	185	1.886	202	2.450	-1.327
Director dummy	185	0.049	202	0.059	-0.466
Teacher dummy	185	0.059	202	0.064	-0.199
AME dummy	185	0.027	202	0.035	-0.431
APE dummy	185	0.032	202	0.050	-0.841
Mobile phone dummy	185	0.341	202	0.267	1.567
Dictator game	185	2.514	202	2.599	-0.802

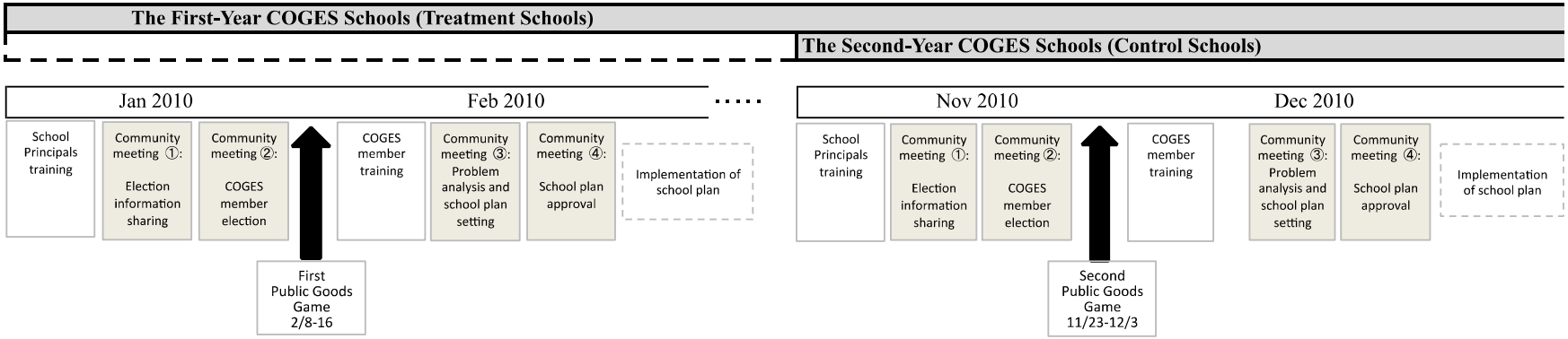

Figure 1. The sequence of events

Table 3. Summary statistics

	"Before" data			"After" data		
	count	mean	sd	count	mean	sd
1st round contribution	694	284.294	127.914	819	340.781	133.954
2nd round contribution	694	312.680	138.370	819	353.846	138.695
COGES implementation dummy (*D*)	694	0.526	0.500	819	0.495	0.500
COGES random assignment dummy	694	0.487	0.500	819	0.470	0.499
Age	694	39.352	14.047	819	41.161	13.020
Male	694	0.558	0.497	819	0.559	0.497
Years of schooling	694	2.148	3.891	819	2.446	4.420
Director	694	0.040	0.197	819	0.051	0.221
Teacher	694	0.048	0.213	819	0.050	0.218
Mothers' Associations (AME) dummy	694	0.029	0.167	819	0.049	0.216
Parents' Associations (APE) dummy	694	0.045	0.207	819	0.050	0.218
Dictator game	694	2.668	1.073	819	2.945	1.192
Group 1 dummy (father group)	694	0.143	0.350	819	0.203	0.402
Group 2 dummy (mother group)	694	0.146	0.353	819	0.200	0.400
Group 3 dummy (community group)	694	0.432	0.496	819	0.201	0.401
Group 4 dummy (mixed group)	694	0.177	0.382	819	0.203	0.402
Group 5 dummy (COGES members)	694	0.102	0.303	819	0.193	0.395

Table 4. Classification of observations

	Before (February 2010)	After (November/December 2010)
First-Year COGES Schools	Y_{1b}	Y_{1a}
Second-Year COGES Schools	Y_{2b}	Y_{2a}

Table 5. Estimated COGES election and implementation effects (local average treatment effect)

	"Before" data (Election Effect)			"After" data (Implementation Effect)		
Specification	(1)	(2)	(3)	(4)	(5)	(6)
Method	IV	IV	IV	IV	IV	IV
Strata FE	YES	YES	YES	YES	YES	YES
Control	NO	YES	YES	NO	YES	YES
D^+ (COGES dummy)	12.03	11.60	12.03	34.01**	33.61**	26.50**
	(15.84)	(15.01)	(13.51)	(16.07)	(15.64)	(13.25)
Group 2 dummy (mother group)		-19.82	-19.72		18.09	6.971
		(27.11)	(25.88)		(26.15)	(23.17)
Group 3 dummy (community group)		-6.943	-13.30		14.57	5.058
		(19.17)	(18.38)		(22.72)	(20.01)
Group 4 dummy (mixed group)		44.27*	28.32		39.53*	32.23
		(23.35)	(21.55)		(22.62)	(20.65)
Group 5 dummy (COGES members)					35.18	30.40
					(21.54)	(19.46)
Amount sent in dictator game			36.15***			41.54***
			(4.303)			(3.835)
2nd round dummy	30.50***	30.50***	30.50***	13.06***	13.06***	13.06***
	(7.027)	(7.027)	(7.027)	(3.633)	(3.633)	(3.633)
Constant	282.6***	282.1***	192.7***	358.3***	354.4***	232.3***
	(26.22)	(37.27)	(39.14)	(20.57)	(33.91)	(33.67)

Kleibergen-Paap rk Wald F statistic for the first stage regression	252.643	271.052	272.977	561.679	570.686	574.236
Observations	1,246	1,246	1,246	1,638	1,638	1,638
R-squared	0.084	0.125	0.199	0.050	0.076	0.205

Note: The dependent variable is the amount contributed in the public goods game with the initial stake of 500FCFA; Robust standard errors are in parentheses; All standard errors are clustered at the school-group level; + indicates an endogenous variable where the first-year COGES assignment indicator is used as an instrumental variable; Control variables are age, years of schooling, and dummy variables for male, private school, Islamic school, school director, teacher, AME member, and APE member; *** p<0.01, ** p<0.05, * p<0.1.

Table 6. Estimated COGES election and implementation effects (intention to treatment effect)

	"Before" data (Election Effect)			"After" data (Implementation Effect)		
Specification	(1)	(2)	(3)	(4)	(5)	(6)
Method	OLS	OLS	OLS	OLS	OLS	OLS
Strata FE	YES	YES	YES	YES	YES	YES
Control	NO	YES	YES	NO	YES	YES
D (COGES dummy)	9.605	9.322	9.674	28.91**	28.59**	22.54**
	(12.80)	(12.26)	(11.01)	(13.47)	(13.17)	(11.14)
Group 2 dummy (mother group)		-20.37	-20.30		19.11	7.771
		(27.65)	(26.34)		(25.74)	(22.85)
Group 3 dummy (community group)		-7.809	-14.24		15.28	5.612
		(19.68)	(18.80)		(22.16)	(19.52)
Group 4 dummy (mixed group)		43.89*	27.85		40.12*	32.69
		(23.87)	(22.04)		(22.26)	(20.41)
Group 5 dummy (COGES members)					35.87*	30.94
					(21.36)	(19.32)
Amount sent in dictator game			36.35***			41.56***
			(4.363)			(3.858)
2nd round dummy	30.50***	30.50***	30.50***	13.06***	13.06***	13.06***
	(7.112)	(7.141)	(7.144)	(3.656)	(3.669)	(3.670)
Constant	283.4***	283.6***	193.8***	360.7***	354.3***	232.1***
	(26.39)	(38.01)	(39.82)	(20.27)	(33.53)	(33.52)
Observations	1,246	1,246	1,246	1,638	1,638	1,638
R-squared	0.083	0.124	0.199	0.068	0.094	0.219

Note: The dependent variable is the amount contributed in the public goods game with the initial stake of 500FCFA; Robust standard errors are in parentheses; All standard errors are clustered at the school-group level; Control variables are: age, years of schooling, and dummy variables for male, private school, Islamic school, school director, teacher, AME member, and APE member; *** p<0.01, ** p<0.05, * p<0.1.

Table 7. Estimated COGES election and implementation effects (with group-specific heterogeneous treatment effect)

	"Before" data (Election Effect)			"After" data (Implementation Effect)		
Specification	(1)	(2)	(3)	(4)	(5)	(6)
Method	IV	IV	IV	IV	IV	IV
Strata FE	YES	YES	YES	YES	YES	YES
Control	NO	YES	YES	NO	YES	YES
VARIABLES						
D x Group 1^+ (fathers)	33.31	42.64	46.13	2.495	8.976	11.34
	(34.30)	(36.28)	(34.01)	(23.54)	(25.44)	(22.03)
D x Group 2^+ (mothers)	-14.66	-17.99	-7.720	27.97	34.38	21.10
	(30.85)	(32.96)	(31.37)	(28.49)	(30.43)	(24.47)
D x Group 3^+ (community)	-13.12	-8.117	-6.722	24.44	26.75	11.30
	(17.44)	(17.50)	(16.34)	(26.68)	(26.47)	(20.37)
D x Group 4^+ (mixed)	76.24***	54.74**	41.58**	62.47***	44.82*	40.37*
	(23.07)	(23.62)	(20.16)	(23.86)	(24.83)	(21.45)
D x Group 5^+ (COGES)				54.04*	54.43*	49.54**
				(28.95)	(28.97)	(25.23)
Amount sent in			36.08***			41.58***
dictator game			(4.455)			(3.868)
2nd round dummy	30.50***	30.50***	30.50***	13.06***	13.06***	13.06***
	(7.027)	(7.027)	(7.027)	(3.633)	(3.633)	(3.633)
Constant	284.9***	294.2***	195.1***	359.2***	377.6***	248.7***
	(25.70)	(30.81)	(33.03)	(20.98)	(28.25)	(28.80)

Kleibergen-Paap rk Wald F statistic for the first stage regression	38.91	37.667	37.682	111.016	113.541	113.996
Observations	1,246	1,246	1,246	1,638	1,638	1,638
R-squared	0.099	0.113	0.189	0.065	0.077	0.206

Note: The dependent variable is the amount contributed in the public goods game with the initial stake of 500FCFA; Robust standard errors are in parentheses; All standard errors are clustered at the school-group level; + indicates an endogenous variable where the first-year COGES assignment indicators interacted with group indicators are used as instrumental variables; Control variables are: age, years of schooling, and dummy variables for male, private school, Islamic school, school director, teacher, AME member, and APE member; *** p<0.01, ** p<0.05, *p<0.1.

Table 8. Estimation of the difference-in-difference model

Specification	(1)	(2)	(3)
Method	IV	IV	IV
Strata FE	YES	YES	YES
Control	NO	YES	YES
VARIABLES			
Y_{1b} (Election Effect)+	12.64	12.20	13.87
(Y_{2b} is taken as a default category)	(16.31)	(15.57)	(14.08)
Y_{1a}^{+}	81.89***	80.05***	62.54***
	(16.20)	(15.66)	(13.56)
Y_{2a}^{+}	47.60***	46.62***	36.73***
	(13.14)	(13.09)	(11.56)
Group 2 dummy (mother)		-2.140	-6.676
		(22.21)	(20.86)
Group 3 dummy (community)		-1.833	-7.378
		(17.00)	(15.91)
Group 4 dummy (mixed)		36.34*	26.87
		(18.67)	(17.52)
Amount sent in dictator game			39.98***
			(3.248)
2nd round dummy	20.48***	20.48***	20.48***
	(3.976)	(3.976)	(3.976)
Constant	280.8***	286.9***	180.3***
	(19.40)	(28.91)	(29.15)
Kleibergen-Paap rk Wald F statistic for the first stage regression	96.17	100.35	100.834
Implementation Effect	34.295*	33.423*	25.806*
	(18.075)	(17.534)	(14.821)
Total Effect	46.934*	45.621*	39.673*
	(26.968)	(25.651)	(22.864)
Observations	2,568	2,568	2,568
R-squared	0.079	0.111	0.214

Note: The dependent variable is the amount contributed in the public goods game with the initial stake of 500FCFA; Robust standard errors are in parentheses; All standard errors are clustered at the school-group level; + indicates an endogenous variable where the first-year COGES assignment indicator is used as an instrumental variable; Control variables are: age, years of schooling, and dummy variables for male, private school, Islamic school, school director, teacher, AME member, and APE member; *** p<0.01, ** p<0.05, * p<0.1. The implementation effect is calculated by taking the difference between the estimated coefficients of a dummy variable for Y_{1a} and a dummy variable for Y_{2a}.

Table 9. Estimated COGES election and implementation effects (with group-specific heterogeneous treatment effect & linking social capital)

	"Before" data (Election Effect)			"After" data (Implementation Effect)		
Specification	(1)	(2)	(3)	(4)	(5)	(6)
Method	IV	IV	IV	IV	IV	IV
Strata FE	YES	YES	YES	YES	YES	YES
Control	NO	YES	YES	NO	YES	YES
VARIABLES						
D x Group 1^{+} (father)	-19.05	-20.53	-9.210	10.45	8.124	12.63
	(40.41)	(41.55)	(40.49)	(36.26)	(37.05)	(31.42)
D x Group 2^{+} (mother)	-72.86	-77.99*	-46.17	-56.72	-57.91	-61.46
	(46.71)	(46.71)	(44.19)	(40.41)	(39.76)	(38.71)
D x Group 3^{+}	-14.68	-7.268	-5.921	24.46	27.32	11.67
	(17.40)	(17.63)	(16.42)	(26.68)	(26.59)	(20.47)
(Group 4 = mixed						
D x Group 4 x father^{+}	50.30*	63.45**	56.66*	-7.921	-2.279	-4.289
	(29.21)	(30.53)	(31.26)	(31.91)	(32.97)	(28.23)
D x Group 4 x mother^{+}	56.44	61.20	38.56	84.73**	95.82***	85.61**
	(38.29)	(38.53)	(35.45)	(33.22)	(33.42)	(35.32)
D x Group 4 x teacher^{+}	49.94	-43.95	-33.30	86.82***	46.93	38.82
	(35.12)	(44.94)	(42.45)	(28.57)	(39.40)	(34.37)
D x Group 4 x director^{+}	107.0***	66.25	47.61	92.54***	44.78	49.23
	(41.00)	(58.19)	(52.27)	(23.51)	(36.29)	(33.50)
D x Group 5^{+}				54.13*	53.34*	48.42*
				(28.97)	(29.08)	(25.37)
Amount sent in			35.62***			41.58***
dictator game			(4.482)			(3.868)
2nd round dummy	30.50***	30.50***	30.50***	13.06***	13.06***	13.06***
	(7.027)	(7.027)	(7.027)	(3.633)	(3.633)	(3.633)
Constant	286.3***	291.1***	194.7***	360.2***	375.1***	246.9***
	(25.93)	(30.59)	(32.48)	(21.21)	(28.60)	(29.00)
Kleibergen-Paap rk Wald F statistic for the first stage regression	22.00	5.486	5.40	69.22	14.774	14.629
Observations	1,246	1,246	1,246	1,638	1,638	1,638
R-squared	0.100	0.121	0.193	0.076	0.085	0.213

Note: The dependent variable is the amount contributed in the public goods game with the initial stake of 500FCFA; Robust standard errors in parentheses; All standard errors are clustered at the school-group level; + indicates an endogenous variable where the first-year COGES assignment indicators interacted with group indicators are used as instrumental variables; Control variables are: age, years of schooling, and dummy variables for male, private school, Islamic school, school director, teacher, AME member, and APE member; *** p<0.01, ** p<0.05, * p<0.1.

Table 10. Estimated impacts of COGES on real world decisions (difference-in-difference estimation)

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Tuition Fee	Textbook Fee	Financial Contribution (FCFA)	School Meal (dummy)	School Meal Frequency (per month)	Functional Toilet (dummy)
Strata FE	YES	YES	YES	YES	YES	YES
After x D^+	456.8*	-41.04	339.2	0.0807*	-0.708	0.0108
	(234.0)	(46.32)	(890.6)	(0.0466)	(1.190)	(0.0510)
D^+	-118.9	7.252	95.59	-0.0213	0.141	0.0667
	(162.6)	(14.02)	(624.1)	(0.0564)	(1.127)	(0.0487)
After	542.6	72.50	1,549	0.365***	0.264	0.0664**
	(477.8)	(71.85)	(1,600)	(0.0868)	(1.282)	(0.0304)
Constant	-305.5	-29.62	1,118	0.594***	19.10***	0.591***
	(211.5)	(22.15)	(917.9)	(0.0475)	(0.872)	(0.0294)
Kleibergen-Paap rk Wald F for the first stage regression	221.079	252.2	193.721	220.405	214.301	219.675
Observations	503	513	428	519	494	517
R-squared	0.521	0.135	0.180	0.283	0.085	0.401

Note: Robust standard errors are in parentheses; + indicates an endogenous variable where the first-year COGES assignment indicator as well as the same variable interacted with an "after" indicator variable are used as instrumental variables; *** p<0.01, ** p<0.05, * p<0.1.

Table 11. Estimated impacts of COGES on real world decisions (difference-in-difference estimation)

	(1)	(2)	(4)	(5)
Sample	All	Before	All	Before
VARIABLES	Number of projects	Number of projects	Amount spent (FCFA)	Amount spent (FCFA)
(1 - *D*) x after	3.278***		108,571***	
	(0.252)		(14,037)	
(1 - *D*)	-3.273***		-110,039***	
	(0.225)		(13,955)	
After	0.0979		-136,287***	
	(0.154)		(12,695)	
Treat		3.273***		110,039***
		(0.225)		(13,962)
Constant	4.469***	1.196***	137,754***	27,716***
	(0.145)	(0.173)	(12,604)	(5,978)
Observations	1,361	469	1,361	469
R-squared	0.124	0.291	0.211	0.073

Note: Robust standard errors are in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

Abstract (in Japanese)

要約

本論文ではブルキナファソにおける学校運営委員会（COGES）設立の効果を検証する。これらの委員会は地域住民から選出されたメンバーを含んでおり、年次活動計画の立案・実施や地域住民と教員間の自発的公共財供給を促すものである。本研究ではランダム化比較実験と、公共財供給に関する人工的フィールド実験（Levitt and List 2007）を組み合わせることで、地方公共財供給における持続可能性という今まで十分に研究が行われてこなかった課題を検証し、そのメカニズムを明らかにする。分析の結果、COGES プロジェクトは公共財実験にて計測された社会関係資本、特に学校・保護者間の連結型社会関係資本（linking social capital）を有意に高めることが明らかになった。COGES プロジェクトの実施は公共財の自発的供給を平均的に 8-10.2%高める。特に、校長・教員・保護者から成るグループについては、運営委員選出のための民主的選挙を通じて 12.7-24.1%、プロジェクトの実施を通じて 11-17.2%公共財供給を高める。これらの結果により、学校運営委員会の設置は公共財供給を高めることでコミュニティによるプロジェクト費用の自己負担を促進し、プロジェクトの財政的持続可能性を高めることが示唆される。さらに、これらフィールド実験に基づくデータの分析結果は当該学校の現実の意思決定データの分析結果とも整合的である。また、本研究の分析結果は行動経済学における社会的選好のモデルを支持するものでもある。

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