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Can School-Based Management Generate Community -Wide Impacts in Less Developed Countries? Evidence from Randomized Experiments in Burkina Faso

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Abstract

While impacts of school-based management (SBM), i.e., decentralization of levels of authority to the school level, in less developed countries have been examined in a number of recent academic studies, the results have been mixed. To bridge a gap in the existing literature, at least partially, this paper evaluates the impact of an SBM program in Burkina Faso, in which targeted schools were rolled out randomly over two years. A novelty of this study is that we examine the program's impacts on community-wide outcomes captured by the level of trust in others by student's parents, and their participation in rotating savings and credit associations (ROSCAs). We hypothesize that parents involved in SBM are more likely to participating in ROSCAs through collaboration with other community members in SBM because they foster trust in others, a necessary precondition for development of informal financial arrangements. Using a unique data set collected exclusively for this study we find that, in particular, relatively poor parents involved in SBM were more likely to participate in ROSCAs than other poor parents. These findings contain two important implications: first, our findings are consistent with the view that social capital, strengthened by SBM, plays a critical complementary role in correcting financial market failures in low income economies (Hayami 2009); and, second, impact evaluation of SBM focusing only on student performance may undervalue its overall effects on the whole community, ignoring important spillover effects of SBM.

Keywords: school-based management, rotating savings and credit associations, trust, Burkina Faso

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1. Introduction

School-based management (SBM), the decentralization of levels of authority to the school level (Caldwell 2005), has recently been implemented in many countries at all income levels, including less developed countries. Under SBM, responsibility and decision making in school operations is transferred to principals, teachers, parents, and community members. SBM in less developed countries is expected to improve educational outcomes because it enhances the accountability of principals and teachers to students and parents and allows local decision-makers to implement education policies adapted to local needs (Patrinos et al. 2009).

Impacts of SBM in less developed countries have been examined in many academic studies based on large-scale quantitative impact evaluations. Yet research on the effects of SBM has shown mixed results and not reached clear conclusions (Westhorp et al. 2014). For example, Jimenez and Sawada (1999) found that an SBM program in El Salvador, EDUCO, which strengthened involvement of parents and community groups in preprimary and primary schools, improved student test scores and class attendance. On the other hand, Banerjee et al. (2010) find no significant effect resulting from interventions to encourage community participation in schools in terms of parental involvement or student attendance. Blimpo and Evans (2011) find that effects of SBM are positive for communities with high literacy but may be negative for those with low literacy. To contribute to further understanding of effects of SBM, this paper evaluates an SBM program in Burkina Faso, in which target schools in the first phase were randomly selected. A unique feature of this paper is our examination of the effects of SBM on involved parental trust toward others and their participation in rotating savings and credit associations (ROSCAs), as well as other community activities unrelated to school – unlike existing studies that examine the effects

of SBM on student performance.[1] SBM of a school can function as a form of social infrastructure to connect parents of students from different segments of a community, thereby facilitating bonding social capital. Therefore it would be natural to presume that SBM may influence students, as well as the whole community, including parents and other community members, through their collaboration in school management. In particular, we hypothesize that parents are more likely to trust others through collaboration with other community members under SBM. As Karlan (2005) finds among borrowers of a microcredit institution in Peru, the degree to which people trust others and how much they think they are trusted by others influences their loan repayment decisions. Therefore, increased levels of trust among community members should influence development of informal financing, including ROSCAs. Accordingly, SBM may indirectly affect development of ROSCAs through changes in trust in the community.

To preview our results, we find supportive evidence for these hypotheses. In particular, relatively poor parents were more likely to participate in ROSCAs when their schools implemented SBM than those who were not exposed to SBM programs. In contrast, relatively rich parents involved in SBM were more likely to participate in other community groups in general. These findings contain two important implications. First, our findings are consistent with the view that social capital, strengthened by SBM, plays a critical complementary role in correcting financial market failures in low income economies (Hayami 2009). We find that such complementarity is strong among the poor, with little access to formal financing than for richer households. Second, these findings suggest that impact evaluation of SBM focusing only on its effects on student performance may undervalue its effects on the whole community. Hence, we need to broaden the design of impact evaluations of SBM to capture its social impacts accurately.

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[1] A variety of educational performance outcomes is examined in Kozuka et al. (2015), a companion paper of this study.

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2. Conceptual framework

In less developed countries, formal financial institutions are underdeveloped, and thus, people rely substantially on informal financial arrangements including ROSCAs (Karlan and Morduch 2010). In ROSCAs, members regularly meet and contribute a certain amount of money, and the sum of the contributions is given to a particular member who is either determined a priori by random assignments or by bidding at each meeting. Therefore, ROSCAs provide credit to members who have received contributions from others in earlier meetings, while also providing savings opportunities to members who may receive contributions later.

Although contributions to ROSCAs with random assignments do not yield any earnings from interest, there are several reasons why people are willing to participate in ROSCAs, instead of simply keeping the money at home. First, Besley et al. (1993) argue that when a needed consumption good is indivisible, the ex ante welfare of individuals is higher when participating in ROSCAs than when not participating in them because individuals can purchase the good earlier on average. Second, members utilize ROSCAs for self-commitment so that they are forced to save in spite of their hyperbolic discounting and consequently avoid time-inconsistent decisions on consumption and saving (Gugerty 2007). Third, Anderson and Baland (2002) empirically find that women are more likely to participate in ROSCAs, possibly because women want to avoid their husbands' misuse of savings.

Although ROSCAs are widely used for the reasons above, savings in ROSCAs are associated with substantial risks, comprising an important factor in decisions to save in ROSCAs (Rutherford and Arora 2009). Wright and Muteesassira (2001), who examined ROSCAs in Tanzania, found that 27 percent of ROSCA members had lost money saved in ROSCAs, leading to 6 percent loss of the total amount of saved money. Therefore, trust

among people is an important prerequisite in forming a ROSCA. In fact, a primary reason for selecting a small number of members of ROSCAs is that fewer people are easier to trust (Wright and Muteesassira 2001). Therefore, we hypothesize that people in less developed economies utilize ROSCAs more extensively when they trust each other.

An important channel of trust building is communication (Das and Teng 1998; Vangen and Huxham 2003). In particular, frequent face-to-face meetings are found to promote trust. For example, Burt and Knez (1995) find that trust among managers in a large firm is higher when they meet face-to-face on a daily basis than when they meet less frequently. Wilson et al. (2006) and Hill et al. (2009) find that people trust their team members more when they meet face-to-face than when they interact through the Internet, utilizing social experiments.

In this respect, SBM programs provide great opportunities for community members to meet, communicate, and collaborate with each other: SBM programs hold meetings of community members regularly to elect their board members, discuss current problems of the school, approve the action plan, and monitor outcomes of the plan. In addition, under SBM, community members often collaborate together to build school facilities and prepare school meals.

Therefore, we hypothesize that SBM fosters deeper trust among community members, thereby indirectly promoting participation in ROSCAs with other community members. In addition, effects of SBM on participation in ROSCAs may vary depending on accessibility of households to financial markets as well as their needs for informal financing. Generally, as households with larger assets and income can rely more on formal financing than otherwise, the effects of SBMs on ROSCAs are likely to be larger for poorer households with little access to formal financing than for richer households.

3. Empirical methodology

To test the above-mentioned hypotheses, we estimate whether the degree of trust in others and the extent of utilization of ROSCAs of each household is promoted by implementation of SBM in local schools where children in the household enroll. As we will explain in the next section in detail, our data include measures of the degree of trust in others and the extent of utilization of ROSCAs. Some of the variables are dummy variables, such as the one for household participation in any ROSCA, whereas others are "truncated" variables with the lower-bound value of zero, such as the monetary amounts contributed at the last ROSCA meeting. When a dummy variable is used as the dependent variable, we employ probit estimations. When a truncated variable is used, we employ tobit estimations.

In either case, in order to consider the dynamic nature of the dependent variable, we include the lagged dependent variable as an independent variable. Effects of treatments are often estimated in difference-in-differences (DID) frameworks to control for unobserved time-invariant effects. Because our estimations always employ limited dependent variables, DID estimations cannot be implemented directly. However, inclusion of the lagged dependent variable can mitigate biases arising from unobserved heterogeneities, at least partially.

Another econometric issue is endogeneity of the treatment variable, a dummy variable that takes a value of one if any child of the given household goes to a community-managed school and zero otherwise. Although the target schools for the SBM project were randomly assigned, some assigned schools did not actually implement SBM while some non-assigned schools may have implemented it by imitating neighboring assigned schools. Therefore, we employ two-step instrumental-variable (IV) probit and tobit estimations of Newey (1987) in which the dummy variable for the random assignment is used as an

instrument.[2] In doing so, we identify the treatment effect on the subpopulation of compliers, i.e., the local average treatment effect (LATE) of Imbens and Angrist (1994). Following Duflo et al. (2012), we employ clustered standard errors at the school level whenever possible.

In addition to the treatment variable, we employ the following control variables. First, we incorporate the number of members in each household, because it may influence the probability of ROSCA utilization. Second, the amounts of assets and income in logs are included to incorporate possible differences in the formation of social capital and the usage of informal financing between the rich and the poor. Third, the share of females in each household and the dummy for female household heads are incorporated, following the finding of Anderson and Baland (2002) that females are more likely to participate in ROSCAs. Finally, we include dummy variables for each stratum used in the stratified sampling strategy explained below, following Pradhan et al. (2014) and Bruhn and McKenzie (2009).[3]

4. Data

4.1 SBM project in Burkina Faso

In Burkina Faso, community involvement in education has been limited until very recently. Although parents' associations (APE) and mothers' associations (AME) have existed as school councils since the 1960s, their function in school management has been limited. To expand involvement of the community and parents in school management, in 2008 the government issued a decree to establish new school committees (Comité de Gestion de

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[2] Alternatively, we may use full information maximum likelihood (FIML) estimations. However, probably because of strong collinearity between the endogenous variable, i.e., the dummy for implementation, and the instrument, i.e., the dummy for random assignment, FIML estimations do not converge in most specifications. Therefore, we employ Newey's two-step approach.
[3] We experimented with estimations without stratum dummies, finding similar results to those from estimations with stratum dummies.

l'Ecole, or COGES) that consist of the mayor, the presidents of APE and AME, the school's director and representatives of teachers, teachers' unions, and NGOs. To strengthen COGES, the Ministry of Basic Education and Literacy (MBEL) launched the "School for All" project (hereafter, the project) in 2009 in cooperation with Japan International Cooperation Agency (JICA).

This is one of a number of similar projects in West Africa implemented by JICA that emphasize the importance of participation of community members in SBM (Honda and Kato 2013). Since the project aims at facilitating social capital accumulation rather than imposing a stringent teacher-monitoring system through delegation to school committees of rights to fire and hire teachers, this type of intervention is classified as a "weak" form of SBM (Barrera-Osorio et al. 2009). The project contains the following three notable features. First, democratic elections among all community members are introduced to select new COGES members, in addition to the members already defined by the decree, because democratic elections can amplify the accountability and transparency of COGES. The president of COGES is also determined in the election. These new COGES members are in charge of monitoring, accounting, and auditing of the school and are expected to promote community participation and enrollment of more students, particularly female students.

Second, COGES determine and implement plans to improve the quality of schools though a series of community meetings in which any community member within the school district can participate. In the first meeting after the election, problems that the school is facing are discussed, and based on the discussion, COGES members make an action plan to be implemented within the school year. In the second meeting, community members discuss and approve the action plan. Typically, action plans include constructing and repairing school facilities such as classrooms, desks, chairs, and toilets, providing housing for teachers, and purchasing learning materials for students. Action plans should be submitted to the central office of the project. Because most schools do not receive any external

resources, COGES need to mobilize financial and physical resources within the community to implement the school action plan. The third meeting is held to monitor the implementation of the action plan, and the fourth meeting is to evaluate COGES activities implemented in the year. The same cycle is repeated every year.

Third, to facilitate these practices by COGES, the project provided several types of training for education officials and COGES members. Before establishing COGES, school directors attend a two-day training to learn how to organize elections for COGES members and community meetings. After elections, school directors, COGES presidents and accountants, and representatives from the municipal offices receive a two-day training to learn how to make, implement, monitor, and evaluate action plans for schools.

4.2 Randomized controlled trial

To examine effects of the SBM project, the MBEL and JICA conducted a roll-out randomized controlled trail (RCT) of SBM in Ganzougou Province located in the central part of Burkina Faso. In the province, half of the schools were randomly selected for the first phase of the implementation of improved COGES. More specifically, utilizing the school list provided by MBEL, JICA first classified the total of 279 schools in the province into strata by educational district and school type. There are 10 districts and three school types, i.e., public schools, private Islamic schools, and private Catholic schools, and hence there are 30 strata. Random assignment at each stratum selected 141 schools as the treatment group and the other 138 schools as the comparison group. However, 9 schools on the list of MBEL did not exist probably due to closures or mergers. As a result, 138 schools remained in the treatment group, with 132 in the control (Panel A of Table 1).

For the treatment group, the project conducted training of school directors in January 2010, and the schools were requested to hold democratic elections in the same

month. In February 2010, the project conducted training of COGES members, and COGES were requested to hold the first community meeting. To the control schools, the project provided the same interventions starting from November 2010.

Based on responses to action plans submitted to the central office of the project, we identified schools that actually implemented COGES in the first phase. Because some schools might not have submitted action plans although they implemented COGES, we also defined schools as having implemented COGES if the school director claimed that schools had an election for COGES members in January, February, or March in 2010, according to the response to the survey after the first phase explained below. Despite the random assignment in the RCT, 12 out of 138 treatment schools did not actually implement COGES, while 7 that were not assigned did actually implement it. Therefore, as Panel A of Table 1 shows, 133 schools were identified as those with COGES in the first phase, while 137 as those without COGES.

4.3 Survey

We conducted surveys of school directors, teachers, students, and heads of students' households from December 2009 to January 2010, i.e., before the implementation of COGES, and from January to February 2011, i.e., after the implementation of the first phase. The principal and the president of APE and AME were surveyed in both periods. In the second round of the survey, presidents of COGES were also surveyed. At each grade in each school, one teacher was randomly selected for the survey if there were many classes in the grade. Also, five students were randomly selected in each class of the selected teacher. The household head of each selected student was also interviewed. This study primarily relies on the surveys of household heads.

4.4 Increasing face-to-face communications through COGES

Our survey of COGES presidents reveals that among the schools that implemented COGES in the first phase, 72 percent had general assemblies five times in their first year, as specified in regulations of COGES (see Section 4.1), whereas 15 percent had them four times. The median[4] rate of the number of participants in a general assembly to the total number of community members reported by COGES is 54 percent. In addition to general assemblies, community members are provided opportunities to collaborate to improve the quality of their school, including building of school facilities such as toilets and kitchens and provide school lunches. In interviews with some target schools, we confirm that community members provide labor in such cases. These figures and anecdotes indicate that members of communities that implemented COGES in the first phase had many opportunities to meet each other face-to-face.

4.5 Characteristics of ROSCAs

Among the 10,494 household-year observations in total (5,075 in 2009 and 5,419 in 2011), our empirical analysis utilizes panel data for 3,853 households, or 73 percent of the total observations, for which necessary data for the two years was completely available. Among the 3,853, only 115, or 3.2 percent, participated in any ROSCA in 2009, whereas the number of households participating in ROSCAs increased to 161, or 4.5 percent, in 2011. The participation rate at the household level is quite low compared with those in other less developed countries: Bouman (1995) reports 50-90 percent of the participation rate at the adult individual level in other sub-Saharan African countries. However, other studies for Burkina Faso also found a low rate of participation in ROSCAs. For example, Sommerfeld et al. (2002) conducted a survey of 40 communities in Burkina Faso with a total population

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[4] We show the median, rather than the mean, because there are many outliers in the participation rate in both sides, such as 0 percent or more than 100 percent.

of approximately 35,000 and identified 30 ROSCAs in which the total number of members was approximately 570. Thus, the ratio of participation in ROSCAs at the individual level was 1.6 percent in Sommerfeld et al. (2002). Assuming that the average number of members in each household is 10 and that the average number of ROSCA participants in each ROSCA-participating household is 2,[5] the participation rate at the household level is 8 percent, which is not very different from those in our sample, 3.2 percent in 2009 and 4.5 percent in 2011. One possible reason for the low participation ratio of ROSCAs is that microcredit institutions are active in rural areas of Burkina Faso. Many microcredit institutions, such as Fonds d'Appui aux Activités Rémunératrices des Femmes (FAAR), are funded by the government, whereas commercial banks such as Banque Agricole et Commerciale du Burkina provide funds to microcredit institutions (Aeschliman 2007). As we will see later (Table 5), households in this study rely more on microcredit institutions than on ROSCAs.

Table 2 demonstrates changes in participation in ROSCAs over the two-year period. Among the 116 households that participated in any ROSCA in 2009, only 10 remained as participants in 2011. However, 151 households that did not participate in any ROSCA in 2009 became participants in 2011. That is, participants in ROSCAs switch drastically over time.

Table 3 shows basic characteristics of ROSCAs in the sample. The mean of the number of ROSCA members in each household that participates in any ROSCA was 1.4 in 2009 and increased to 3.7 in 2011. In other words, ROSCAs in this region developed both at the extensive margin (i.e., the number of households participating in ROSCAs) and at the intensive margin (i.e., the number of ROSCA members in the participating household). The average number of meetings in the last three months for each ROSCA was 4.5 in 2009 and 3.7 in 2011, indicating that average ROSCAs had meetings once every three to four weeks.

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[5] These averages are taken from our sample. See Table 3.

The average monetary contribution in each ROSCA meeting was 1,709 CFA francs in 2009 and 2,137 in 2011. The average monetary reward in the last 6 months was 17,401 and 13,803 CFA francs in 2009 and 2011, respectively. The median contribution was 125 in 2009 and 200 in 2011, and the median receipt was 3,500 in 2009 and 3,000 in 2011. Converted into US dollars,[6] median ROSCA members contributed 0.2-0.4 dollars in each meeting and received 6-7 dollars in their turn. Therefore, ROSCAs in the region examined were underdeveloped in terms of both the number of ROSCAs and the amount of finance.

Table 4 shows that in 24 percent of ROSCAs, winners of funds at each meeting were randomly determined, while 44 percent and 18 percent determined them depending on members' needs for funds and using the combination of the two methods, respectively. As shown in Table 5, 40 percent of households who participated in ROSCAs and responded to a question about the main reason for receiving funds from ROSCAs chose "to repay credits" as the main reason. The second largest reason (30 percent) is "others" which includes purchases of durable consumer goods. Investment, such as expenditures on schooling, agricultural materials, and lands, was the main reason for only 25 percent of the households. The high ratio of repayment purposes for funds from ROSCAs can be highlighted more clearly when it is compared with the low ratio (6 percent) of repayment purposes and a high ratio (59 percent) of investment purposes for funds from microcredit institutions (right columns of Table 5).

Our estimations of the effect of school-based management on the development of ROSCAs employ two measures of ROSCAs: one is the dummy variable for participation in any ROSCA, and the other is the amount of monetary contribution at the last ROSCA meeting. If SBM promoted a degree of trust among participants and thus helped ROSCAs develop in the community, we would expect both the number of ROSCA participants and

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[6] According to the World Bank's World Development Indicators, one CFA franc was equivalent to 0.0021 US dollars in 2009 and 2011.

the monetary contribution in ROSCA meetings to increase. To incorporate possible non-linear relations, we take a log of the amount of contributions in ROSCAs in a specification. In addition, because contributions are zero if households do not participate in any ROSCA, we add one before taking the log. Summary statistics for these measures of ROSCAs in 2011 (dependent variables) and in 2009 (control variables) are shown in the upper rows of Table 6.

4.6 Construction of other key variables

Another key dependent variable, the degree of trust in others, is based on the following question taken from the General Social Survey of the National Opinion Research Center: "Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people?" We constructed a dummy variable that takes a value of one if the household head answered, "Most people can be trusted" and zero if the head answered "I can't be too careful." Table 6 shows that the average of the trust dummy was 0.496 in 2011 and 0.489 in 2009. However, Table 7 indicates that, as in the case of participation in ROSCAs, the trust dummy changes over time for many household heads. Among the 3,583 households, approximately one half, or 1,751, trusted most people in 2009, but 45 percent of them, or 786, did not trust most people any more in 2011. On the other hand, 44 percent of 1,832 household heads who did not trust most people in 2009 had begun to trust people in 2011.

Summary statistics for key control variables are also shown in Table 6. Income is the sum of self-reported amounts of income from agriculture, self-employment, wages, and other sources. The amount of assets is the sum of self-evaluated values of livestock, lands, houses, equipment, and furniture. On average, the total income of the household in the last 6 months was 1.36 million CFA francs, or approximately 2,700 US dollars, while assets were

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364 thousand CFA francs, or 700 US dollars. The average of the share of females in adult members who were defined as 16 years or older, was 57 percent, whereas 5 percent of the household heads were females.

5. Results

5.1 Effects on the degree of trust

We first estimate effects of the implementation of school-based management on the degree of trust of people in the community, using the trust dummy explained in the previous section. We start with a simple probit model and show the results in columns (1) and (2) of Table 8. To incorporate possible heterogeneity in effects of SBM among different income levels of households, an additional specification incorporates the interaction term between the dummy for implementation of SBM in the community (hereafter, the SBM dummy) and income in logs.[7] From the probit estimations, we find no significant effect of the dummy or its interaction with the income level.

Next, we correct for biases due to endogenous implementation of SBM despite their random assignments, by employing two-step minimum chi-squared estimations of probit models derived in Newey (1987). The dummy variable for random assignments and its interaction with the income level when necessary are used as instruments. The results shown in columns (3) and (4) of Table 8 find no significant effect of the SBM dummy or its interaction term.

There are two possible technical reasons for this insignificant effect on trust. First, although schools were randomly selected for SBM, the two randomly selected groups were not *ex ante* balanced with respect to the trust dummy, as shown in Panel A of Table 9. The

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[7] We also experimented with the interaction term between the SBM dummy and the amount of assets in logs. However, because we did not find any significant effect of the interaction term, we dropped it from the analysis.

same panel shows that the two groups were balanced with respect to other dependent variables, the ROSCA dummy and the amount of contribution in the last ROSCA meeting. Accordingly, two groups of schools, schools that actually implemented SBM and those that did not, were also unbalanced with respect to the trust dummy, although they were balanced with respect to the two variables for ROSCAs (Panel B). In other words, in schools in which SBM was implemented, the level of trust among parents was intrinsically lower than others prior to the implementation, and hence this unobservable effect may have led to a downward bias to the effect of SBM. Second, our measure of trust is a dummy variable that takes a value of either zero or one. Therefore, when the level of trust for people who already felt that most people can be trusted becomes even higher, our trust dummy cannot measure such an increase in the trust level. This may also generate a downward bias for the effect of SBM if it is in fact positive, Third, conceptually, the estimations here should examine effects of the SBM dummy on the degree of trust among the community. However, the question on which our trust dummy is based is about trust toward others in general, rather than trust to community members in particular.

To alleviate the first two problems, we focus on a sub-sample of households for which the trust dummy in 2009 was zero. By so doing, we can eliminate the first problem that the treatment group and the control group were not balanced with respect to the level of trust prior to the treatment. In addition, we can minimize the problem of impossible identification of increases in the trust level for already high levels of trust. The results from probit and IV probit are shown in columns (1) and (2) of Table 10, indicating that the implementation of SBM was likely to generate trust among people who had not trusted others prior to the implementation. Further, we test exogeneity of the SBM dummy by a Wald test. The p value from the Wald test is 0.592, indicating that we cannot reject its exogeneity. Therefore, we can rely on the results from the probit estimation. The marginal effect of the SBM dummy from the probit estimation is 0.03 when evaluated at means.

Thus, when households who did not trust others participated in SBM, the probability that they will start to trust others is larger by 3 percentage points than when they did not participate in SBM.[8]

In addition, we experiment with ordinary least squares (OLS) and 2-stage least squares (2SLS) estimation of the first difference in the trust dummy. The results shown in columns (3) and (4) of Table 10 indicate a positive and significant effect of the SBM dummy on an increase in the degree of trust. The point estimates from the OLS and 2SLS estimations are similar to the marginal effect from the probit. Further, because the first difference in the trust dummy takes only three values, -1, 0, and 1, and it can be assumed to be determined by a latent variable, we employ ordered probit estimation without and with instruments, instead of OLS and 2SLS. The results are shown in columns (5) and (6), indicating a positive and significant effect of the SBM dummy. The marginal effect of the SBM dummy on the probability of increasing the trust dummy by one is 0.03, as in the case in the probit estimation for households who did not trust most people in 2009.

The results from the alternative specifications provide weak evidence that the implementation of SBM improved the level of participants' trust toward others.

5.2 Effects on ROSCAs

Now, we estimate the effect of SBM on the development of ROSCAs. As we mentioned earlier, we employ two measures of ROSCAs: One is the dummy variable for participation in any ROSCA, and the other is the amount of monetary contribution in the last ROSCA meeting. As in the previous sub-section, we start with simple probit and tobit estimations and then extend them to incorporate instrumental variables. We also experiment with interaction terms between the SBM dummy and the income level.

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[8] We also conducted the same analysis for households for which the trust dummy in 2009 is one, finding the effect of SBM is insignificant.

Columns (1) and (2) of Table 11 show results on the ROSCA dummy from probit, whereas columns (3) and (4) show those from IV probit of Newey (1987). In both estimation methods, when the interaction term between the SBM dummy and the income level is incorporated, the SBM dummy has a positive and significant effect whereas the effect of its interaction with income is negative and significant. Wald tests of endogeneity suggest that in both IV probit estimations, the SBM dummy is in fact exogenous. These results imply that implementation of SBM encouraged participation in ROSCAs for poor households, while the effect is opposite for richer households. From the estimated coefficients in the IV probit estimation, the threshold income is 12.1. According to Table 6, this threshold value is close to its mean. Further examination indicates that 47.8 percent of households were below the threshold income level. Therefore, the poorer half of households were more likely to participate in ROSCAs when SBM was implemented, while the richer half were less likely to do so.

To quantify the effect of SBM, we compute the average marginal effect of the SBM dummy for a hypothetical sample in which the income level is at either the lowest decile, the median, or the highest decile, and other variables are at means. For the lowest decile income, the average marginal effect is 0.016. That is, when the hypothetical household with a lowest income participated in SBM, the probability of participating in ROSCAs would increase by 1.6 percentage points. Because the average rate of participation in ROSCAs was 3.2 percent in 2009, this average marginal effect for low-income households is large in size. The average marginal effect is 0.0015 for the median household and -0.010 for the richest decile.

Table 12 shows results using the contribution in the last ROSCA meeting in logs (Panel A) and without taking a log (Panel B) as the dependent variable. In both panels, both tobit and IV tobit estimations yield a positive effect of the SBM dummy and a negative effect of the interaction term between the SBM dummy and the income level. The threshold

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value of income is 12.3 and close to the mean. Therefore, as we found in the effect on participation in ROSCAs, the implementation of SBM increased the amount of contribution in ROSCA meetings for the poorer half while decreasing it for the richer half. Using the logged income, the positive effect for the poorest decile for which income in logs is 10.8 is 3.29 (= 27.54 − 2.245*10.8). This implies that participation in SBM more than tripled the amount of contribution in each ROSCA meeting for poor households.

5.3 Effects on community groups

Besides ROSCAs, SBM may influence other community activities. Therefore, we further examine the effect of the SBM dummy on the number of household members who participate in active community groups at the time of the survey.[9] Because this variable is available only in 2011, we cannot incorporate its lag as an independent variable. As Table 6 shows, the mean and maximum of the dependent variable are 0.68 and 6, respectively. We employ a Poisson model and its two-step estimation using Newey (1987). According to the results shown in Table 13, the richer half of the sample households increased the number of household members participating in active community groups when their schools implemented SBM. In contrast, the poorer households are less likely to participate in community groups possibly due to binding time constraints arising from being involved in the COGES project.

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[9] We asked each household head about each household member's participation in any social group (such as cooperatives, women groups, religious groups, and political groups) and the degree of the participation. We counted the number of household members who participated in any social group and the degree of participation as either "leader," "very active," or "somewhat active."

6. Discussion and conclusion

The empirical findings in this paper can be summarized as follows: First, we found weak evidence of a positive effect of the implementation of SBM on trust among parents; and second, SBM seems to encourage participation in ROSCAs of poorer parents, while discouraging participation of richer parents. Also, SBM increased the average amount of contribution in ROSCA meetings for poorer parents and decreased it for richer parents. In contrast, more members in richer households that participated in SBM were involved in active community groups.

In the related literature on social capital, Glaeser et al. (2000) find that the measure of trust from the question on trust in GSS is indeed correlated with a measure of trustworthiness, not with a measure of trust, taken from experimental trust games. Moreover, Karlan (2005) finds that a measure of trustworthiness from trust games is positively correlated with the level of repayment in microcredit transactions. Our finding that SBM improves both the level of trust and participation of poor households in ROSCAs is consistent with those of Glaeser et al. (2000) and Karlan (2005). Indeed, a companion study to the current study, Sawada et al. (2015), finds that the COGES project increased the average amount of people's voluntary contributions in a public goods game, and is significantly correlated with the trust level in GSS, according to Anderson et al. (2004).

These results suggest that through participation in SBM, parents and other community members work together to improve the quality of schools and therefore begin to trust each other. The SBM project in Burkina Faso was particularly helpful in fostering trust within the community because it promotes face-to-face communication of community members through the election of the SBM committee, regular community-wide meetings, and training for SBM. Then, the fostered trust in the community helps to develop community networks and activities, including informal financing such as ROSCAs, among

community members, because the absence of trust is the major barrier to such activities. It is notable that SBM leads to the development of ROSCAs at extensive margins, i.e., an increase in the number of ROSCA participants, as well as at intensive margins, i.e., an increase in the amounts contributed in ROSCA meetings. The positive effect on ROSCAs was more prominent for the poor, probably because lack of trust is a larger barrier to informal financing among the poor. By contrast, richer households expanded other types of community networks.

These findings contain two important implications. First, our findings are consistent with the view that social capital, strengthened by SBM, plays a critical complementary role in correcting financial market failures in low income economies (Hayami 2009). This view is also consistent with recent studies that indicate the complementary role of community mechanisms in amending market failure and/or government failures (Angelucci and De Giorgi 2009; Feigenberg et al. 2013; Mobarak and Rosenzweig 2013). We find that such complementarity is strong among the poor with little access to formal financing than for richer households. Second, these findings suggest that impact evaluation of SBM focusing on its effects on student performance may undervalue its effects on the whole community. Hence, we need to broaden the scope and design of impact evaluation of SBM to capture its social impacts more accurately.

The positive role of SBM in trust building should also be evaluated from a different perspective. Trust builds on itself in a virtuous circle, i.e., better outcomes from trusting reinforce trust. However, the virtuous circle may not always work because trust is susceptible to risks of opportunistic behaviors by partners (Vangen and Huxham 2003). If no community member takes the risk of being the first mover in a trust relationship, the community may end up with a bad equilibrium without any trust among people. In that case, SBM can be an effective means to achieve the virtuous circle of trust building. Because trust is associated with overall development of an economy (Durlauf and Fafchamps 2005; Knack

and Keefer 1997; Putnam 1993), building trust through SBM in rural regions of less developed countries is expected to generate a substantial impact in reducing poverty.

Finally, it should also be noted that the development of ROSCAs stimulated by the SBM program is a second best solution to the lack of financial institutions in the region. Policies that support development of formal financial institutions may be more direct and effective measures to solve the problem of financial market failure, and further improve welfare. Such policies may include public interventions to promote development of formal microcredit institutions. These issues should be carefully investigated in future studies.

References

Aeschliman, C. 2007. "Financial Cooperatives in Rural Finance: Case Study: Burkina Faso's Caisse Populaire Network (Rcpb)." Agriculture and Rural Development Internal Report. Washington DC: International Bank for Reconstruction and Development and World Bank. http://www.ruralfinanceandinvestment.org/sites/default/files/1178721168497_Burkina_Faso.pdf

Anderson, L. R., J. M. Mellor, and J. Milyo. 2004. "Social Capital and Contributions in a Public-Goods Experiment." *American Economic Review* 94 (2): 373-76.

Anderson, S., and J-M. Baland. 2002. "The Economics of Roscas and Intrahousehold Resource Allocation." *Quarterly Journal of Economics* 117 (3): 963-95.

Angelucci, M., and G. De Giorgi. 2009. "Indirect Effects of an Aid Program: How Do Cash Transfers Affect Ineligibles' Consumption?" *American Economic Review* 99 (1): 486-508.

Banerjee, A.V., R. Banerji, E. Duflo, R. Glennerster, and S. Khemani. 2010. "Pitfalls of Participatory Programs: Evidence from a Randomized Evaluation in Education in India." *American Economic Journal: Economic Policy* 2: 1-30.

Besley, T., S. Coate, and G. Loury. 1993. "The Economics of Rotating Savings and Credit Associations." *The American Economic Review* 83 (4): 792-810.

Blimpo, M. P., and D. K. Evans. 2011. "School-Based Management and Educational Outcomes: Lessons from a Randomized Field Experiment." Unpublished manscript. http://siteresources.worldbank.org/EDUCATION/Resources/Blimpo-Evans_WSD-2012-01-12.pdf.

Bouman, F. J. 1995. "Rotating and Accumulating Savings and Credit Associations: A Development Perspective." *World Development* 23 (3): 371-84.

Bruhn, M., and D. McKenzie. 2009. "In Pursuit of Balance: Randomization in Practice in Development Field Experiments." *American Economic Journal: Applied Economics* 1 (4): 200-32.

Burt, R. S., and M. Knez. 1995. "Kinds of Third-Party Effects on Trust." *Rationality and Society* 7: 255-92.

Caldwell, B. J. 2005. *School-Based Management.* Paris: International Institute for Educational Planning.

Das, T. K., and B-S Teng. 1998. "Between Trust and Control: Developing Confidence in Partner Cooperation in Alliances." *Academy of Management Review 23* (3): 491-512.

Duflo, E., R. Hanna, and S. P. Ryan. 2012. "Incentives Work: Getting Teachers to Come to School." *American Economic Review* 102 (4): 1241-78.

Durlauf, S. N., and M. Fafchamps. 2005. "Social Capital." In *Handbook of Economic Growth,* edited by P Aghion and SN Durlauf, vol. 1B,. 1639-99. Amsterdam: Elsevier BV.

Feigenberg, B., E. Field, and R. Pande. 2013. "The Economic Returns to Social Interaction: Experimental Evidence from Microfinance." *Review of Economic Studies 80* (4): 1459-83.

Glaeser, E. L., D. I. Laibson, J. A. Scheinkman, and C. L. Soutter. 2000. "Measuring Trust." *Quarterly Journal of Economics* 115 (3): 811-46.

Gugerty, M. K. 2007. "You Can't Save Alone: Commitment in Rotating Savings and Credit Associations in Kenya." *Economic Development and Cultural Change* 55 (2): 251-82.

Hayami, Y. 2009. "Social Capital, Human Capital and the Community Mechanism: Toward a Conceptual Framework for Economists." *Journal of Development Studies* 45 (1): 96-123.

Hill, N. S., K. M. Bartol, P. E. Tesluk, and G. A. Langa. 2009. "Organizational Context and Face-to-Face Interaction: Influences on the Development of Trust and Collaborative Behaviors in Computer-Mediated Groups." *Organizational Behavior and Human Decision Processes* 108: 187-201.

Honda, S., and H. Kato 2013. "Scaling up in Education: School-Based Management in Niger." In *Getting to Scale: How to Bring Development Solutions to Millions of Poor People*, edited by L. Chandy, A. Hosono, H. Kharas, and J. L. Linn. Washington, DC: Brookings Institution.

Imbens, G. W., and J. D. Angrist. 1994. "Identification and Estimation of Local Average Treatment Effects." *Econometrica* 62: 467-75.

Jimenez, E., and Y. Sawada. 1999. "Do Community-Managed Schools Work? An Evaluation of El Salvador's EDUCO Program." *World Bank Economic Review* 13 (3): 415-41.

Karlan, D. S. 2005. "Using Experimental Economics to Measure Social Capital and Predict Financial Decisions." *American Economic Review* 95 (5): 1688-99.

Karlan, D. S., and J. Morduch. 2010. "Access to Finance." In *Handbook of Development Economics*, edited by D. Rodrik, and M.R. Rosenzweig, vol. 5. Amsterdam: Elsevier B.V.

Knack, S., and P. Keefer. 1997. "Does Social Capital Have an Economic Payoff? A Cross-Country Investigation." *Quarterly Journal of Economics* 112: 1251-88.

Kozuka, E., Y. Sawada, and Y. Todo. 2015. "How Can Community Participation Improve Educational Outcomes? Evidence from a Sbm Project in Burkina Faso." Paper presented at the Workshop on Participatory School-Based Management for Improving Quality: Findings and Policy Implications from Three Studies. Ouagadougou: Ministry of Education of Burkina Faso and JICA.

Mobarak, A. M., and M. R. Rosenzweig. 2013. "Informal Risk Sharing, Index Insurance, and Risk Taking in Developing Countries." *American Economic Review* 103 (3): 375-80.

Newey, W. K. 1987. "Efficient Estimation of Limited Dependent Variable Models with Endogenous Explanatory Variables." *Journal of Econometrics* 36: 231-50.

Patrinos, H. A., T. Fasih, H. A. Patrinos, and L. Santibanez. 2009. "Decentralized Decision-Making in Schools: The Theory and Evidence on School-Based Management." Washington, DC: World Bank Publications.

Pradhan, M. D., Suryadarma, A. Beatty, M. Wong, A. Gaduh, A. Alisjahbana, and R. P. Artha. 2014. "Improving Educational Quality through Enhancing Community Participation: Results from a Randomized Field Experiment in Indonesia." *American Economic Journal: Applied Economics 6* (2): 105-26.

Putnam, R. D. 1993. *Making Democracy Work: Civic Traditions in Modern Italy.* Princeton University Press: Princeton.

Rutherford, S., and S. Arora. 2009. *The Poor and Their Money.* Warwickshire: Practical Action Publishing..

Sommerfeld, J., M. Sanon, B. A. Kouyate, and R. Sauerborn. 2002. "Informal Risk-Sharing Arrangements (Irsas) in Rural Burkina Faso: Lessons for the Development of Community-Based Insurance (Cbi)." *International Journal of Health Planning and Management* 17 (2): 147-63.

Vangen, S., and C. Huxham. 2003. "Nurturing Collaborative Relations Building Trust in Interorganizational Collaboration." *Journal of Applied Behavioral Science* 39 (1): 5-31.

Westhorp, G., B. Walker, P. Rogers, N. Overbeeke, D. Ball, and G. Brice. 2014. *Enhancing Community Accountability, Empowerment and Education Outcomes in Low and Middle-Income Countries: A Realist Review.* London: EPPI-Centre, Social Science Research Unit, Institute of Education, University of London.

Wilson, J. M., S. G. Straus, and B. McEvily. 2006. "All in Due Time: The Development of Trust in Computer-Mediated and Face-to-Face Teams." *Organizational Behavior and Human Decision Processes* 99 (1): 16-33.

Wright, G. A., and L. K. Muteesassira. 2001. "The Relative Risks to the Savings of Poor People." *Small Enterprise Development* 12 (3): 33-45.

Table 1. Random assignment and actual implementation of SBM

Panel A: School level

Random assignment	Actual implementation		Missing at the time of survey	Total
	No	Yes		
No	125	7	6	138
Yes	12	126	3	141
Total	137	133	9	279

Panel B: Parent level

Random assignment	Actual implementation		Total
	No	Yes	
No	2,535	142	2,677
Yes	214	2,414	2,628
Total	2,749	2,556	5,305

Table 2. Changes in participation in ROSCAs over time

	Non-participants in 2009	Participants in 2009	Total
Non-participants in 2011	3,316	106	3,422
Participants in 2011	151	10	161
Total	3,467	116	3,583

Table 3. Characteristics of ROSCAs

	Year	N	Mean	Median	S.D.	Min.	Max.
Number of ROSCA members in the household	2009	115	1.435	1	0.975	1	6
	2011	161	3.714	1	1.146	1	18
Number of ROSCA meetings in 3 months	2009	115	4.461	3	3.320	0	18
	2011	161	3.714	3	2.589	0	12
Money contributed to ROSCA last time	2009	115	1,709	125	9,626	0	100,000
(CFA franc)	2011	161	2,137	200	11,570	150,000	150,000
Money received from ROSCA in 6 months	2009	115	17,401	3,500	32,908	0	220,000
(CFA franc)	2011	161	13,803	3,000	25,258	0	180,000

Table 4. Methods to determine the winner in ROSCAs

	Number of ROSCAs	Share (%)
Randomly	125	24.3
Depending on needs	224	43.6
Combination of the two above	92	17.9
Others	73	14.2
Total	514	100%

Notes: These figures are the sum of the number of household members participating in any ROSCA in any year. Therefore, the total number of ROSCAs in this table exceeds the total number of household-year observations participating in any ROSCA, or $161 + 115 = 276$.

Table 5. Purposes of funds from ROSCAs and microcredit institutions

	ROSCAs		Microcredit Institutions	
	Number	Share (%)	Number	Share (%)
Schooling	13	12.3	5	2.3
Medical services	2	1.9	5	2.3
Funeral	1	0.9	0	0.0
Wedding	2	1.9	1	0.5
Purchases of agricultural materials	11	10.4	125	56.6
Purchases or rental of land	3	2.8	1	0.5
Credit repayment	42	39.6	14	6.3
Others	32	30.2	70	31.7
	106	100%	221	100%

Notes: These figures are the sum of the number of household members participating in any ROSCA in any year. However, the total number of ROSCAs in this table is substantially smaller than the total number of household-year observations participating in any ROSCA, 276, because most households did not respond to questions about purposes of funds from ROSCAs.

Table 6. Summary statistics of key variables for estimations

	Year	Mean	SD	Min	Max
Dummy for ROSCA	2009	0.032	0.177	0	1
	2011	0.045	0.207	0	1
Log (1 + contribution in the last ROSCA meeting)	2009	0.162	0.980	0	11.513
	2011	0.210	1.170	0	11.918
Log (1 + receipt of funds from ROSCA last time)	2009	0.143	1.173	0	12.766
	2011	0.235	1.515	0	12.301
Trust dummy	2009	0.489	0.500	0	1
	2011	0.496	0.500	0	1
Number of household members	2009	10.392	5.050	2	38
in logs	2009	2.239	0.447	0.693	3.638
Total income (6 months, CFA franc)	2009	3.63E+05	6.00E+05	0	7.54E+06
in logs	2009	12.126	1.462	0	15.835
Share of females in adult members	2009	0.570	0.168	0	1
Female household head	2009	0.049	0.217	0	1
Number of HH members participating in active community groups	2011	0.677	0.896	0	6

Notes: The number of observations is 3,583. 1 CFA franc is approximately equal to $0.0021 in 2009 and 2011, according to World Development Indicators.

Table 7. Changes in the degree of trust over time

Answers to "Generally speaking, would you say that most people can be trustedor that you can't be too careful in dealing with people?"

	"I can't be too careful" in 2009	"Most people can be trusted" in 2009	Total
"I can't be too careful" in 2011	1,019	786	1,805
"Most people can be trusted" in 2011	813	965	1,778
Total	1,832	1,751	3,583

Table 8. Effects of community-managed schools on the degree of trust

Dependent variable: Dummy variable for trusting others

	(1)	(2)	(3)	(4)
	Probit	Probit	IV probit	IV probit
School-based management (SBM)	0.0469	0.242	0.0522	0.646
	(0.0582)	(0.400)	(0.0484)	(0.426)
SBM * income (log)		-0.0160		-0.0489
		(0.0326)		(0.0349)
Lagged dependent variable	0.240***	0.240***	0.240***	0.241***
	(0.0496)	(0.0494)	(0.0461)	(0.0462)
Number of HH members (log)	0.101*	0.101*	0.101*	0.102*
	(0.0530)	(0.0531)	(0.0520)	(0.0521)
Assets (log)	-0.0352*	-0.0277	-0.0352**	-0.0126
	(0.0190)	(0.0246)	(0.0157)	(0.0228)
Income (log)	0.000856	0.000877	0.000810	-0.000228
	(0.0142)	(0.0142)	(0.0142)	(0.0143)
Share of females in adults	0.212*	0.213*	0.213*	0.218*
	(0.128)	(0.128)	(0.129)	(0.129)
Female head	0.105	0.104	0.105	0.105
	(0.105)	(0.105)	(0.113)	(0.114)
Observations	3,583	3,583	3,583	3,583
Wald statistic (*p* value)			0.806	0.230

Notes: Standard errors are in parentheses. *, **, and *** signify statistical significance at the 10, 5, and 1 percent level, respectively. Dummies for strata are included as independent variables.

Table 9. Balancing test for the degree of trust prior to the treatment

Panel A: Random assignment of community-managed schools

	Assigned	No	Difference	*t* statistic
Trust dummy	0.470	0.506	-0.0361	-2.162
ROSCA dummy	0.0325	0.0317	0.00321	0.140
Contribution in last ROSCA meeting	0.161	0.160	-0.000621	0.0190

Panel B: Actual implementation of community-managed schools

	Implemented	No	Difference	*t* statistic
Trust dummy	0.474	0.502	-0.0279	-1.672
ROSCA dummy	0.0339	0.0303	0.00360	0.611
Contribution in last ROSCA meeting	0.156	0.165	0.00900	0.276

Table 10. Effects of community-managed schools on the degree of trust: alternative specifications

Dependent variable: Dummy variable for trusting others

	(1)	(2)	(3)	(4)	(5)	(6)
	Probit	IV probit	DID	DID-IV	Ordered probit	IV Ordered probit
School-based management (SBM)	0.105	0.120*	0.0520*	0.0548*	0.157*	0.0890**
	(0.0783)	(0.0670)	(0.0293)	(0.0323)	(0.0897)	(0.0427)
Observations	1,833	1,833	3,583	3,583	3,583	3,583

Notes: Standard errors are in parentheses. *, **, and *** signify statistical significance at the 10, 5, and 1 percent level, respectively. Dummies for strata are included as independent variables. All the independent variables included in estimations for Table 8 are also included, but the results are not shown for brevity. Columns (1) and (2) focus on the sub-sample of households who did not trust people a priori, while other columns utilize the whole sample.

Table 11. Effects of community-managed schools on participation in ROSCAs

Dependent variable: Dummy for participation in ROSCAs

	(1)	(2)	(3)	(4)
	Probit	Probit	IV probit	IV probit
School-based management (SBM)	0.0165	1.269*	-0.00935	1.513*
	(0.0950)	(0.673)	(0.0852)	(0.870)
SBM * income (log)		-0.103*		-0.125*
		(0.0549)		(0.0710)
Lagged dependent variable	0.353*	0.359*	0.353**	0.359**
	(0.184)	(0.185)	(0.176)	(0.177)
Number of HH members (log)	-0.0552	-0.0562	-0.0546	-0.0563
	(0.1000)	(0.0999)	(0.0908)	(0.0907)
Assets (log)	0.0417	0.105***	0.0420	0.117**
	(0.0333)	(0.0406)	(0.0315)	(0.0557)
Income (log)	-0.0140	-0.0161	-0.0137	-0.0169
	(0.0210)	(0.0206)	(0.0231)	(0.0232)
Share of females in adults	0.440**	0.441**	0.439*	0.440*
	(0.204)	(0.205)	(0.228)	(0.229)
Female head	0.0129	-0.00387	0.0126	-0.00351
	(0.190)	(0.188)	(0.193)	(0.196)
Observations	3,583	3,583	3,583	3,583
Wald statistic (*p* value)			0.498	0.660

Notes: Standard errors are in parentheses. *, **, and *** signify statistical significance at the 10, 5, and 1 percent level, respectively. Dummies for strata are included as independent variables.

Table 12. Effects of community-managed schools on monetary contributions in ROSCAs

Panel A: Dependent variable: Monetary contributions in last ROSCA meeting (in logs)

	(1)	(2)	(3)	(4)
	Tobit	Tobit	IV tobit	IV tobit
School-based management (SBM)	0.289	24.21**	0.00361	27.54**
	(1.269)	(12.04)	(1.307)	(14.00)
SBM * income (log)		-1.947**		-2.245**
		(0.982)		(1.135)
Lagged dependent variable	1.056**	1.063**	1.055**	1.062**
	(0.484)	(0.481)	(0.442)	(0.441)
Number of HH members (log)	-1.273	-1.308	-1.265	-1.311
	(1.396)	(1.384)	(1.417)	(1.411)
Assets (log)	0.761	2.022***	0.768	2.192**
	(0.683)	(0.711)	(0.511)	(0.915)
Income (log)	0.106	0.0619	0.108	0.0490
	(0.426)	(0.400)	(0.411)	(0.409)
Share of females in adults	6.179*	6.295*	6.173*	6.289*
	(3.194)	(3.216)	(3.572)	(3.580)
Female head	0.621	0.185	0.619	0.194
	(2.996)	(2.935)	(2.961)	(3.013)
Observations	3,583	3,583	3,583	3,583
Wald statistic (*p* value)			0.625	0.769

Panel B: Dependent variable: Monetary contributions in last ROSCA meeting

	(1)	(2)	(3)	(4)
	Tobit	Tobit	IV tobit	IV tobit
School-based management (SBM)	-145.2	28,790	-587.2	33,838*
	(1,582)	(19,458)	(1,768)	(18,899)
SBM * income (log)		-2,355		-2,808*
		(1,611)		(1,533)
Observations	3,583	3,583	3,583	3,583
			0.576	0.724

Notes: Standard errors are in parentheses. *, **, and *** signify statistical significance at the 10, 5, and 1 percent level, respectively. Dummies for strata are included as independent variables. All the independent variables included in estimations for panel (A) are also included in those for panel (B), but the results are not shown for brevity.

Table 13. Effects of community-managed schools on participation in community groups

Dependent variable: Number of household members participating in active community groups

	(1)	(2)	(3)	(4)
	Poisson	Poisson	IV Poisson	IV Poisson
School-based management (SBM)	0.0275	-1.000**	0.00996	-1.168***
	(0.0584)	(0.425)	(0.0477)	(0.432)
SBM * income (log)		0.0837**		0.0960***
		(0.0337)		(0.0350)
Observations	3,583	3,583	3,583	3,583

Notes: Standard errors are in parentheses. *, **, and *** signify statistical significance at the 10, 5, and 1 percent level, respectively. Dummies for strata are included as independent variables. All the independent variables included in estimations for panel (A) of Table 8 are also included, but the results are not shown for brevity.

Abstract (in Japanese)

要約

住民参加型の学校運営方式である school-based management（SBM）の効果は、開発途上国においても多くの研究によって検証されてきたが、必ずしもその評価は定まっていない。本研究は、ブルキナファソにおける SBM の効果をランダム化比較試験によって推計したものである。本研究の特長は、SBM が生徒の成績に与える効果ではなく、SBM を通じて生徒の親が学校経営に参加することで互いの信頼関係が強化され、地域のインフォーマルな金融的相互扶助組織である回転型貯蓄信用講（ROSCA）がより発展するかどうかを検証したところにある。分析の結果、特に貧しい家庭では、生徒の親が SBM に関わることで他人に対する信頼感を増し、ROSCA により参加するようになったことが見出された。この結果は、途上国において社会関係資本が金融市場の失敗を修正する役割を担うという考え方（Hayami 2009）と整合的である。また、生徒の成績に焦点を当てた効果分析は、SBM が地域全体に与える影響を過小評価することを示唆している。

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Evidence from the COGES Project in Burkina Faso

Yasuyuki Sawada and Takaharu Ishii