DRAFT

Giving it Back:
Evaluating the Impact of Devolution of School Management to Communities in Nepal

Nazmul Chaudhury
World Bank
nchaudhury@worldbank.org

Dilip Parajuli
World Bank
dparajuli@worldbank.org

September 22, 2010

Abstract

Empirical evidence on the causal relationship between education decentralization and schooling outcomes is limited either because rigorous impact evaluations are lacking or when they exist, primarily from Latin America, often present mixed findings. The initiative taken by the Government of Nepal to transfer responsibility of managing schools from the state to the community represents one of the most ambitious education decentralization reforms taken by any government. This study describes the research initiative to evaluate the impact of this devolution reform. Since participation in the program is under the discretion of the community (i.e., program participation in endogenous) an exogenous instrument is introduced in the form of an advocacy group working with randomly chosen communities to persuade them to participate in the program. Short-run impact estimates derived from an empirical strategy that combines instrumental variable (IV) and difference-in-difference (DD) methods, suggest that devolving management responsibility to communities has a significant impact on certain schooling outcomes related to access and equity, however, does not improve learning outcomes. Furthermore, the impact on school governance measures is mixed. There is also an important regional variation in outcomes, underlying the importance of path-dependent institutional factors which modulates the causal pathways of the impact of this intervention.

1. Decentralization and School Performance

There is tremendous heterogeneity in delivery of education services worldwide – ranging from public schools financed and operated by the state to purely private schools. For example, while the primary school sector is highly centralized and dominated by public provision in Japan, it is relatively decentralized in the Netherlands where public-aided religious (Catholic and Protestant) providers outnumber government schools. However, both countries produce good learning outcomes (e.g., have comparable levels of mathematics achievement as measured by TIMSS). While by now there is a consensus on the empirical link between education quality and economic growth (e.g., Barro 2001; Hanushek and Kimko 2000), there is very little consensus on the determinants of school quality. Existing research on the relationship between quality and school inputs does not lend itself to generalizable policy levers which are scalable or universally applicable (e.g., Glewwe and Kremer 2006; Case 2005; Hanushek 2003; Todd and Wolpin 2003).

While there might be little consensus on how to improve quality[1], there is widespread concern about the poor quality of education in many developing countries. This spans primarily from the disappointing experience of centralized public schooling systems in many developing countries plagued by poor governance (e.g., Chaudhury et al. 2006) and dismal learning outcomes (e.g., Das et al. 2006). Improving accountability and voice at the local level through greater engagement of local governments and communities could be one way to improve schooling outcomes. However, the international evidence on the relationship between decentralization and school quality is limited given that there is a paucity of rigorous impact evaluations to begin with, and from whatever evaluations exists, the findings are often contradictory. This is not surprising given that one can theoretically make the case for both. On one hand it can be argued that centralization can help maximize economies of scale and is better suited to play an equalizing role when there is substantial heterogeneity in local level resource endowment and capacity (e.g., Besley and Coate 2003). While on the other hand, it can be argued that transfer of significant fiscal and administrative rights to the local level can help to improve accountability of providers (e.g., Gunnarsson et al. 2004). This 'duality' is highlighted by the empirical study by Galiani et al. (2004) who find that administrative decentralization of secondary schools in Argentina did indeed increase average test scores. However, while there was a significant increase in test scores in richer municipalities, test scores actually went *down* in poorer municipalities.

Politics also contributes to difficulties in making decentralization improve service delivery (Chaudhury and Devarajan 2006). Groups that currently benefit from the centralized system often resist decentralization. Sometimes states do have legitimate apprehensions given capacity at the local level can indeed be weak. But the reason why local capacity is weak to begin with is that in many cases local governments have never had discretionary resources, and therefore never had an incentive to build capacity in resource management. For example, there is now consistent empirical evidence on the extent of teacher absenteeism in India documented by numerous studies. If control over providers were devolved to local governments (*gram panchayats*), could they do better? Probably. We are forced to employ the language of probability because no local government in India has been given credible powers over public providers for us to evaluate the impact. This is despite the fact that local governments are constitutionally "responsible" for

---

[1] Even though there strong evidence from the developed world which shows that quality can be improved if teacher pay can be systematically indexed to pupil learning outcomes and teacher assessment, (e.g., Gordon et al. 2006), this approach has still to be scaled up at the national level. Furthermore, this approach is still limited in many developing countries which do not systematically measure learning outcomes, far less have the capacity to index assessments with teacher performance.

primary health care centers and primary schools in India. That rhetoric of empowerment has, however, not been matched by the transfer of real administrative and fiscal powers to these local governments (Hammer et al. 2006; Pritchett and Pande 2006). For example, over 90 percent of the recurrent expenditure budget in education goes towards teacher salaries, however, teacher salaries are not under the control of the local government (nor for that matter, any administrative authority over teacher recruitment, posting, firing, etc). So having *de jure* 'responsibility' without credible fiscal or administrative levers, often curtails the *de facto* power of local governments.

School-based management (SBM) is one of the most radical forms of educational decentralization, as it involves the transfer of key decision-making powers to the school/community itself, often bypassing local governments. School-level management involving teachers, parents, and other community members, is perceived as being more effective because actors who have the best information about what actually goes on in schools are best able to make appropriate decisions about how the schools should be managed (King et al. 1999). This is assuming, however, that teachers/schools and parents have the same objective function in mind. Furthermore, there is often considerable variation in the vector of fiscal and administrative powers that are actually devolved to the school/community level. Thus, again it is not surprising that impact evaluations of SBM initiatives give a mixed picture. For example, Summers and Johnson (1996) review four evaluations of SBM initiatives in the United States – the collective findings suggest a weak or non-existent relationship between devolution and learning outcomes. Moving beyond the metric of learning outcomes, there is some evidence that SBM can help to improve other aspects of schooling. Jimenez and Sawada (1999) find that parents are more likely to interact with their pupil's teachers in rural El Salvador following the introduction of the *EDUCO* program. They also find that *EDUCO* helped to lower pupil truancy rates. However, the impact of *EDUCO* on Spanish scores was weak, while there was no impact on mathematics scores. King et al. (1999) evaluate a program in Nicaragua (*School Autonomy*) which delegated more discretionary powers to teachers/parent councils. While there was an increase in decisions made at the school level, there was no significant impact on learning outcomes. As the authors suggest, that autonomy per se did not appear to have any impact of test scores, might be due to a lag between the time it takes a treatment school/community to fully internalize and exercise its new powers. Using more recent data on the same Nicaraguan program, Parker (2004) evaluates the effect of the reform on student test scores in Spanish and mathematics in the 3rd and 6th grades. The study reinforces earlier findings of greater school-level initiatives following the intervention, however, the impact on learning outcomes is ambiguous (no improvement in Spanish and a positive effect for mathematics only in the third grade). Gertler et al. (2008) evaluate a program in Mexico (*AGE*) that involves parents directly in the management of schools located in highly disadvantaged rural communities. The study finds that the initiative increased the participation of parents in monitoring school performance and decision-making; furthermore, there was in improvement in intermediate school quality indicators (e.g., reduction in grade repetition rates).

As suggestive from the studies highlighted above, there is a growing coda of empirical studies on the impact of education decentralization from Latin America. That is not surprising given that Latin America has been at the center of this decentralization movement. Empirical evidence from other parts of the developing world is, however, rather scarce. Preliminary results from a randomized evaluation in Kenya show very little process or outcome impacts of a school committee improvement initiative (Kremer and Vermeersch 2005). Several studies suggest that the impact of school devolution is attenuated due to the reluctance of parents to get involved in school matters when they perceive that they have either insufficient information or insufficient authority to make meaningful decisions. Pandey et al. (2008) find that parents in the state of

Madhya Pradesh, India, belonging to parent-teacher associations empowered to certify teacher attendance in order for teachers to receive their salary, often sign-off without actually bothering to verify teacher attendance.

To summarize, the limited existing evidence suggest that SBM is not necessarily a panacea, and that there are a host of mediating factors which ultimately shape success or failure of such initiatives. The problem is that the full nature of these conditioning factors (historical, political, social) have yet to be fully documented, and furthermore we are currently not in a position to generalize given the confluence of unknowns. For now, the best we can do is to continue to carefully evaluate episodic reform initiatives and try to synthesize as we collate more and more experiences worldwide. Given the complex nature of the problem, a sound but sterile econometric impact evaluation, should ideally be accompanied by parallel in-depth qualitative exploration to unpack the deeper political and social factors which modulate the causal pathways.

2. Community Management of Schools in Nepal

Historically, Nepal has had a unique tradition of communities establishing and managing schools. Until 1950s, there were only a handful of government schools in the entire country (mostly located in urban areas) and the majority of the population was deliberately denied access to education by the autocratic Rana regime. Nepal entered an era of modernization only after the overthrow of the Rana regime in 1951, and this led to a proliferation of community schools which sprung up to fill the vacuum in the education sector. This organic community initiative was most pronounced in the Hill region of Nepal (an issue that we will come back to later on in the paper). In 1971, the government made the decision to take over fiscal and managerial responsibility of these schools effectively nationalizing community managed schools and transforming them into government schools The rational was that increased government financing and provision of teachers hired through the central civil service would improve equity and quality of the education system.

In reality the government unfortunately failed to hold teachers accountable and provide quality education. Owing to over-whelming public dissatisfaction with the state of the education system, the Government in 2001 decided to return schools to community management on a gradual and voluntary basis. The enactment of the Seventh Amendment to the Education Act in 2001 paved the way for schools to be made more accountable to the community via a public-community partnership in which the government would continue to provide financing while delegating management responsibility to communities. The management structure at the school level formalized by the formation of a School Management Committees (SMC) and a Parent Teacher Associations (PTA).

The Education Act 2001 renamed all government-funded schools as community schools (ironically, historically speaking), empowering communities to establish and manage schools, provided they have a functional SMC. In practice, however, the Act by itself did little to change things at the school level (besides an official renaming of school type). To help jump-start the process of actually implementing the reform agenda, the Government of Nepal (GoN), with the assistance of the World Bank, launched the Community School Support Project (CSSP) in 2003. Under the project, a community which formally takes over management of their school (through a simple application process), is provided with a one-time grant of approximately $1,500 as a fiscal incentive. The school management transfer option is available to all communities, and the transfer process is completely voluntary, i.e., communities have to formally apply to the government for taking over school management responsibilities. Community 'ownership'

empowers the school management committee, consisting of parents and influential local citizens, with various staffing and fiscal decisions. For example, community managed schools (CMS) have the right to re-post regular (government-recruited) teachers back to the district headquarters, to directly hire and fire community-recruited teachers, and to index teacher salaries to school performance. The community managed schools are also given more un-tied block grants so that the management committee has more control over discretionary spending. Furthermore, a number of new grants are available to CMS when they attract more female teachers and pupils from disadvantaged groups. The project was later integrated into the Education For All Program (EFA, 2004-2009) and now mainstreamed into the current School Sector Reform (SSR, 2010-2014) Program, the flagship program of the government in the education sector.   To date, over 10,000 schools out of 25,000 public schools have been transferred to community management.

3. Evaluation Objective

The success of the community managed schools reform program is predicated on the belief that communities can do a better job than the government in managing schools and in being more responsive to the needs of the locality. As mentioned earlier, the international experience with community management of schools is mixed and one cannot say that community management will automatically translate to better outcomes in the education sector in Nepal. No other country has conducted such a comprehensive program of 'handing-over' management of the public school system to the community. The impact of such a sweeping reform on schooling access, equity, quality and governance is of much interest to national and international policy-makers, as well as the research community.

This impact evaluation attempts to address this knowledge-gap, by comparing the effectiveness of two models of primary school management: (i) Government-managed school and (ii) Community-managed school (after management transfer).

The impact of community school management arrangement is evaluated on the following dimensions and indicators (table 1):

Table 1: Dimensions and Indicators in Community School Evaluation

Dimension	Indicators
Access	Proportion of out-of-school children
Equity	Proportion of out-of-school children for disadvantaged population groups
Efficiency	Grade progression rate Grade repetition rate
Governance	Level of parental/community participation Trained personnel for maintaining financial records Teacher absenteeism rate
Learning levels	Student test scores in mathematics and Nepali language (curriculum-based) Student test scores in mathematics and science

4. Evaluation Design

Randomized promotion as instrumental variable

The design of this impact evaluation is based on a quasi-experimental randomization approach. It is ultimately up to the community to officially take over management of their school. Because of

this important feature, one cannot design a purely randomized experiment[2], i.e., force communities against their will to take over their schools or prevent communities from taking them over. Instead, the design relies on inducing an exogenous source of variation that is independent of community and school characteristics. Evaluating the impact of transferred schools relative to non-transferred schools needs to account for the self-selection nature of program participation (by schools and communities) in the formal management transfer process.

In order to induce this exogenous variation, the approach taken in this study is as follows. A randomly chooses set of communities were encouraged to formally take over management of their school. This was achieved through an advocacy campaign outreach by a Non-governmental Organization (NGO), Center for Policy Research & Consultancy (CPReC), by visiting, informing and encouraging a randomly chosen set of communities to request handover of their school and help them prepare an application for the hand-over. This encouragement serves as a predictor of whether a community chooses to ultimately request official management responsibility of the school. Since the encouraged communities are randomly chosen, the variation in school management system generated by this encouragement campaign does not depend on community characteristics, and hence exogenous. Since the communities voluntarily choose whether to request handover of their schools, there will not be a one-to-one link between the schools that have been chosen to receive the 'encouragement' (visit from the NGO) to request handover and the schools that actually request handover: some schools that receive the 'encouragement' might not request the handover, while some schools that do not receive the 'encouragement' might still choose to request the handover. In econometric terms, the random allocation to either of the advocacy groups will serve as an instrumental variable for the choice of taking over school management handover for the "Treatment on the Treated" estimation (more in the next section, empirical strategy).

Pilot Impact Evaluation

Given that there was no prior information to base the efficacy of the NGO advocacy encouragement on the management transfer take-up rate, a small sample pilot IE was carried out between 2005 and 2007. The pilot evaluation was also important to calibrate the sampling strategy and field-test survey instruments. The pilot was conducted in 80 schools and their communities from 6 districts in the country. Sample of schools and districts were drawn using two-stage stratified random sampling. Baseline survey for the pilot sample was fielded during November 2005-February 2006; advocacy intervention in randomly allocated sub-sample took place after the baseline; end-line survey for the same sample was fielded in November of 2007 (Chaudhury and Parajuli, 2009). Lessons learnt from the pilot IE in terms of sampling strategy, randomly assigned advocacy and transfer take-up rate, survey instruments and logistics, were used to scale up the evaluation to a nationally representative sample.

Full IE: Baseline Survey and Follow-up Survey

To precisely assess the impact of this community management intervention, the evaluation design involved measuring schooling and other relevant indicators both at baseline (before the program

---

[2] Communities cannot be forced to over their schools nor prevented from taking them over if they apply for the transfer. Randomly phase-in of the transfer process was not an option given the Government policy was that any community which applied for formal management responsibility should be allowed to take back the school given that there was no administrative or fiscal constraints to justify rationing.

intervention) and after the intervention at a follow-up round. The sample size for this scaled-up impact evaluation is a nationally representative sample of 220 schools from 16 districts covering all major geographic regions. A two-stage stratified sampling procedure was followed to draw the sample[3]. The baseline survey of this detailed sample was conducted in August 2007-November 2007, and the follow-up survey of the same communities during August-November 2009. Both the baseline and follow-up survey was conducted by New Era, an independent survey and research institute.

Multi-module survey instruments included census of all households with primary school-aged children in the school "catchment[4]" communities, school survey, teacher survey, community survey, and child and teacher tests. Table 2 below describes sample sizes and the information collected for each of these survey instruments at baseline and follow-up. The survey data include: (a) household socio-economic, demographic and education information on about 30,000 households and 180,000 individuals including 54,000 children from 5-16 age-group; (b) school level information from 220 schools and head-teachers, 1200 teachers, 400 classroom observations; (c) community questionnaires for 430 community leaders; (d) curriculum-based child achievement tests and anthropometric data from 6700 children (including out-of-school children); and (e) Grade 5 TIMSS-type tests for 4,000 students. Curriculum based tests in math and language were given to randomly selected 30 children in the 5-14 age-group in or out of school in the catchment area, as well as to all primary school teachers in the selected school. And a sub-set of math and science test items taken from the 4th grade Trends in International Mathematics and Science Study (TIMMS) test given to grade 5 students in the survey schools. The TIMSS is administered by the International Association for the Evaluation of Educational Achievement (IEA). That is what we mean when we refer to the 'TIMSS test' throughout the study – not the actual TIMSS administered by IEA given that Nepal does not participate in this internationally comparable standardized test. Implementation details of the two rounds of survey are described in New Era reports (2008, 2010).

Table 2: Survey instruments and sample sizes

Questionnaires	Unit	Sample Size	
		Baseline, 2007	**Follow-up, 2009**
School Information Form	Head Teacher	220	220
Teacher Form	Teacher	1197	1277
Household Census Form	Household	29,241	30,043
	Individual (all in roster)	183,407	185,693
	Child aged 5-16	53,946	55,091
Curriculum-based Achievement Tests	Child aged 5-16	6,769	6,691
Anthropometric Measurement Module	Child aged 5-16	6,769	6,6691
TIMSS-based Tests	Grade 5 students	4,104	4,735
Teacher Competency Tests	Primary school teacher	801	907
Class-room Observation Modules	Nepali and Mathematics classes (two from each school)	439	437
Community Form	Community Leader (two from each school community)	434	437

---

[3] The sixteen districts were randomly sampled from Nepal's 75 districts, representing three climatic belts (mountain, hill, terai) and five development regions of the country (east-west). Within each selected district, 14 schools (if Hill or Terai) and 10 schools (if Mountain) were randomly selected, making it a total of 220 schools.

[4] "Catchment" area refers to a settlement village or block that a particular school identifies as its service area and from where majority of its primary-aged children come for study.

Full IE: Random Advocacy Intervention

At the baseline, all 220 sampled schools were government-managed schools. Out of those 220 schools[5], 'encouragement' intervention in the form of NGO Advocacy took place in 150 randomly selected communities immediately after the baseline survey. Center for Policy Research & Consultancy (CPReC) was commissioned to carry out the advocacy campaign that involved stakeholder meetings with parents, teachers, parent-teacher associations (PTA) and SMC from the selected school community to provide information on the government policy, and procedures regarding the devolution initiative. The implementation details for the advocacy treatment can be found in the CPReC Report (2008). The advocacy (150) and non-advocacy (70) sub-samples are 'balanced' in the baseline survey (i.e., there is no significant statistical difference between the two sub-samples for average values of key variables – this will be highlighted in the results section of the paper).
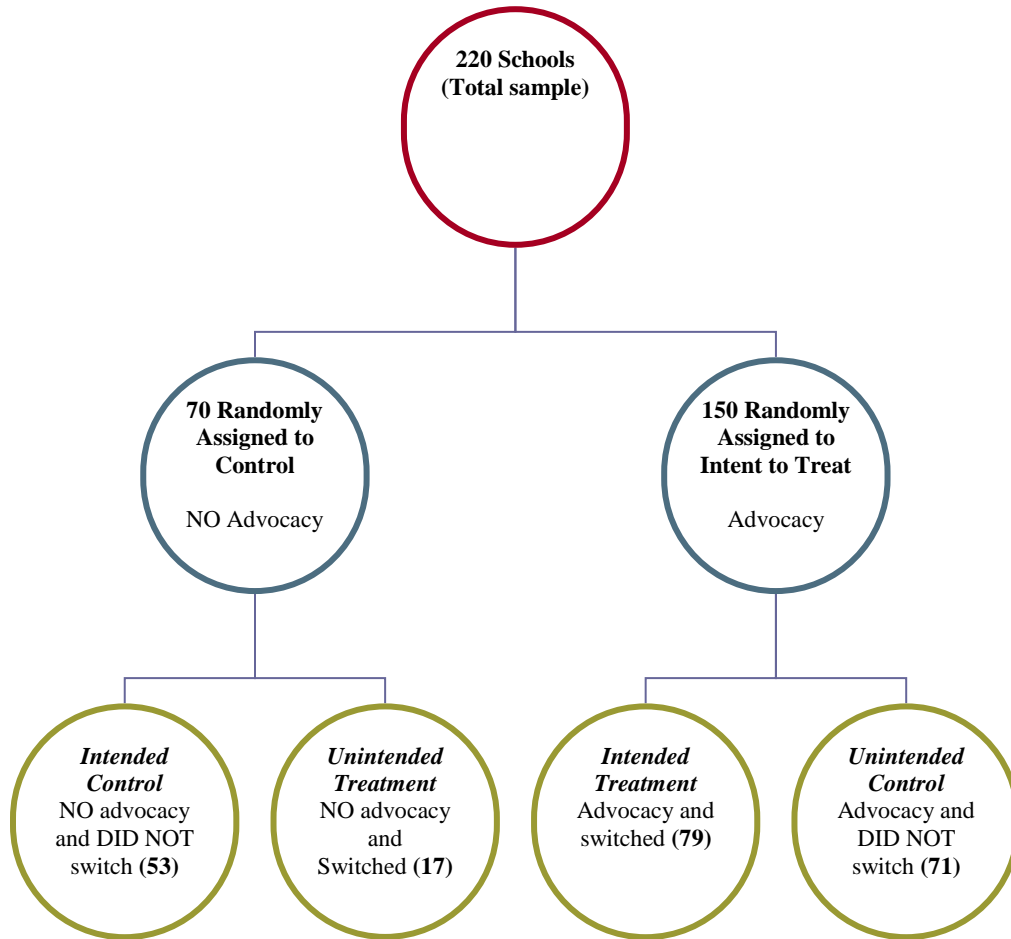
Differential take-up rate from random 'promotion'

As mentioned earlier, schools from both sets of groups – the advocacy sample and non-advocacy sample - can decide to opt for community management transfer[6]. The follow-up survey, conducted after two years of the advocacy program, demonstrated that this was indeed the case. Moreover, as expected higher proportion of schools under the random advocacy promotion participated in the actual community management initiative.:79 of the 150 "intent-to-treat" (53%) schools took up the community management option, while only 17 out of the 70 "control" (24%) schools, resulting in a net take up rate of 29%, justifying the identification instrument used in this study (figure 1).

---

[5] Schools and community/catchment area is often used interchangeably throughout this study given there is a one-to-one mapping – one school is mapped to one community/catchment area.

[6] For a school that chooses to transfer into community management, District Education Office facilitates the transfer process by counter-signing an agreement with school SMC and providing such schools/communities with one-time incentive grant of 100,000 Nepali Rupees (about US$1500).

Figure 1: Results from Random promotion/advocacy

220 Schools (Total sample)

70 Randomly Assigned to Control

NO Advocacy

150 Randomly Assigned to Intent to Treat

Advocacy

Intended Control
NO advocacy and DID NOT switch **(53)**

Unintended Treatment
NO advocacy and Switched **(17)**

Intended Treatment
Advocacy and switched **(79)**

Unintended Control
Advocacy and DID NOT switch **(71)**

5. Empirical Strategy

The primary objective of the evaluation is to identify the impact of community management on the outcomes of interest. As described in the previous section on the evaluation design, since participation in the community management program is endogenous, an exogenous instrument is introduced in the form of an advocacy 'encouragement', applied to a sub-sample of schools in this study. This randomly assigned encouragement serves as a predictor of whether a school will choose to transfer, but does not affect outcomes directly. In econometric terms, the random allocation to advocacy and non-advocacy groups will serve as an instrumental variable (IV) for the choice of community management transfer.

In addition, the data is available for a period before the intervention (baseline) as well as after the intervention (follow-up), and this allows for the use of difference-in-difference (DID) estimation. This paper evaluates the impact using an empirical strategy that combines IV technique with DID method. Our preferred specification for this study is an instrumental variables (IV) model in which the randomly assigned advocacy campaign is used as an instrument for actual takeover of school management. The random assignment to advocacy is correlated with actual participation in the devolution program but uncorrelated with the error term in the outcome equation (since it was assigned randomly). This model yields a consistent estimate of the ''treatment on the treated'' effect[7] (under certain assumptions described below).

In the first stage, the randomly assigned advocacy 'promotion' is used to predict whether the school switched over to be community-managed by time t, using the following linear model:

$$(1) \qquad C_{jt} = \varphi_1 + \varphi_2 A_{jt} + \varepsilon_{jt}$$

where C is binary indicator of whether school j is under community management, and A is a binary indicator of whether school j received the advocacy intervention.

In the second stage, we estimate the effect of community management C on outcomes, using the predicted values for community management from the first stage regression. In cases where the unit of observation is at child or household level i (below the village/ school catchment area level j), the following second stage regression is used:

$$(2) \qquad Y_{ijt} = \mu + \gamma \hat{C}_j + \delta T_t + \beta \hat{C}_j * T_t + \lambda X_{ijt} + e_{ijt}$$

where Y represents a vector of dependent variables (e.g., out-of-school status, grade progression, repetition, test scores), $\hat{C}$ denotes the predicted probability of whether the school j will choose the community management transfer or not, T is a baseline (pre-transfer) and follow-up (post-transfer) binary dummy variable, X is vector of individual/household/village controls, and e is a

---

[7] One can also use a specification that provides the 'intent to treat' estimates using the randomly assigned advocacy (A) by the NGO directly instead of predicted community participation ($\hat{C}$). However, this does not represent the effect of the program itself given that some communities which did not receive the advocacy campaign decided on their own to participate in the program, while some communities which received the advocacy campaign still decided not to take over school management.

random error term. In cases where the unit of observation is at the village/school catchment area level, the notation i is dropped in the second-stage regression specification.

The coefficient β obtained through an OLS regression represents the ''treatment on the treated'' effect of participating in the community managed school program. The standard error associated with this coefficient indicates whether the impact estimate for a given outcome variable is statistically significant or not. Because there is within-community interdependence of the dependent variables, and that the community is the unit of treatment (for both advocacy promotion and actual school management type), the standard errors are clustered at the community level[8].

There are basically two conditions to be satisfied by our IV variable approach: advocacy A has to be correlated with our endogenous variable C (actual transfer of community management), and A has to be uncorrelated with error term e in (2). The first condition is easily met as we showed earlier that A predicts C (*net* take-up rate is 29%). The second condition implies that A has no direct influence on Y but all of the effect of A on Y is passed on through C. Since A is exogenous and not correlated with the error term e, the predicted value of C is also not correlated with the error term e, hence minimizing possible endogenous contamination.

6. Results

Data

For output indicators for access, we estimate the impact on proportion of out-of-school children. Because the time-lag between the two rounds of survey is only two years, the expected impact should be more pronounced on younger children, aged 5-7. Therefore, we focus our result on this age-cohort, while also looking at the entire primary school going age, 5 to 9 as well. With regard to equity, we estimate the out-of-school status for the same younger children from disadvantaged[9] caste/ethnicity groups. Efficiency is measured by grade progression rate and repetition rate estimated for students already in primary school grades. As for indicators of school governance, we look at a number of measures encompassing different aspects of accountability, transparency and participation. Transparency is proxied by share of schools with trained personnel to keep proper record-keeping of financial matters, and willingness of SMCs to form monitoring committees consisting of parents. Participation is captured by the share of SMCs committed to recruiting more female teachers. Accountability is proxied by teacher absenteeism rates (as noted by unannounced school visits by survey enumerators). For outcome indicators of school quality, we use student learning levels as measured by their test scores in both curriculum-based mathematics and language, and in TIMSS-based mathematics and science subjects.

Baseline means of the output/outcome variables (Y) are shown in Table 3. First thing we note is the mean differences between the two groups of schools/communities– random assigned

---

[8] Moreover, the standard errors are corrected to account for the fact that predicted values, and not the actual values of the C, are used in the second-stage regression. To generate consistent estimates of the parameter coefficients and their standard errors, we implement the empirical strategy using "ivreg2" command in STATA, with "cluster" option and appropriate specification to account for the instrumentation of the interaction term in the model. The ivreg2 is a user-written command in STATA for instrumental variable estimations (Baum CF, Schaffer ME, Stillman S, *Stata Journal 7:4*, 2007).

[9] As classified by the Government of Nepal

advocacy promotion (treatment) and non-advocacy (control) –were not statistically significant[10]. This indicates that the baseline sample was 'balanced', further supporting the strength of our exogenous instrument (advocacy).

We also note that close to 19 percent of children aged 5-7 and 14 percent of those aged 5-9 were out-of-school in 2007. The proportion for children from disadvantaged caste/ethnicity groups was slightly higher compared to all children. Close to four out of five students in primary school progressed to next grade while almost 16 percent repeated the grade that year. At the school level, only one in five schools had a PTA committee assigned to monitor school activities in 2007. Similarly, only 23 percent of schools reported that they had trained personnel/staff for proper record-keeping of financial accounts. At the time of survey, only two in five schools had all teachers present at the school. In terms of staffing composition, females accounted for less than 30 percent of all teachers. As seen in the table, the average score in curriculum-based Grade 3 level Nepali test was just above 50 (on a scale of 0-100), and that in mathematics for the same grade level was barely 40. TIMSS-based test scores for Grade 5 students were close to 30 points, science scores just a little higher than mathematics scores.

Table 3: Descriptive Statistics, Baseline Survey 2007.

Outcome indicators	No Advocacy	Advocacy	All Sample
Proportion of out-of-school children, younger children aged 5-7	19.7%	18.5%	18.9%
Proportion of out-of-school children, Disadvantaged caste/ethnic groups	22.3%	21.7%	21.9%
Proportion of out-of-school children, aged 5-9	15.2%	13.7%	14.3%
Grade progression in primary grades	83.0%	80.6%	81.5%
Grade progression in primary grades, Disadvantaged groups	82.8%	79.7%	80.9%
Grade Repetition in primary grades	14.5%	16.6%	15.9%
Grade Repetition in primary grades, Disadvantaged caste/ethnic groups	14.6%	17.2%	16.2%
Schools with Parents' Monitoring Committees	22.9%	20.0%	20.9%
Schools with trained personnel for proper record-keeping	24.3%	22.0%	22.7%
Schools with all teachers present	35.7%	42.7%	40.5%
Share of teachers absent from schools	13.1%	14.5%	14.1%
Share of Female teachers	28.2%	29.1%	28.8%
Student Test scores, Grade 3 level in Nepali (scale 0-100)	52.6 (20.2)	54.4 (19.9)	53.8 (20.0)
Student Test scores, Grade 3 level in Mathematics	41.0 (20.2)	41.1 (19.9)	41.0 (20.0)
Grade 5 TIMSS Test score in mathematics	27.7 (14.3)	28.4 (16.0)	28.2 (15.4)
GRADE 5 TIMSS Test score in science	34.2 (17.3)	34.1 (18.0)	34.2 (17.8)

Note: Standard deviations for tests scores in parentheses

---

[10] To test the statistical significance of mean differences between the two groups, we derive p-values from regressions of these variables on advocacy variable at the baseline.

Impact estimates

Table 4 presents the results of the impact estimates using the empirical strategy described in the previous section (regressions are included in the appendix). Average treatment effect of the formal transfer of school management responsibility to the community is estimated to be a 14.5 percentage point reduction in the share of out-of-school children for overall sample. For children from disadvantaged caste/ethnicity groups, the effect is estimated at 16.6 percentage point reduction in out-of-school status. These estimates clearly indicate impressive impacts on two stated objectives of the decentralized management reform program, namely access and equity.

Table 4: Impact Estimates from Instrumental Variable and Difference-in-Difference Estimations.

Outcome indicators	Impact Estimate	Statistically Significant
Reduction in proportion of out-of-school children	14.5	Yes
Reduction in proportion of out-of-school children, Disadvantaged caste/ethnic groups	16.6	Yes
Increase in grade progression in primary grades	16.8	Yes
Reduction in grade repetition in primary grades	12.3	Yes
Schools with Parents' Monitoring Committees	41.3	No
Schools with Parents' Monitoring Committees, Hills & Mountains	52.9	Yes
Schools with Parents' Monitoring Committees, Terai	-15.9	No
Schools with trained personnel for record-keeping	49.0	Yes
Schools recruiting new Female teachers	44.6	Yes
Schools recruiting new Female teachers, Hills and Mountains	46.6	Yes
Schools recruiting new Female teachers, Terai region	35.9	No
Teachers absenteeism rate	4.6	No
Teachers absenteeism rate, Hills and Mountains	-13.4	No
Teachers absenteeism rate, Terai Region	72.0	No
Grade 3 level student test scores in Nepali (sd)	-0.43	No
Grade 3 level student test scores in Mathematics (sd)	-0.71	No
Grade 5 TIMSS Test score in mathematics (sd)	0.21	No
GRADE 5 TIMSS Test score in science (sd)	1.13	No

Notes: (1) All impact estimates are in percentage points, except for test scores that are expressed in standard deviation units. (2) Statistical significance tests carried out with standard errors corrected for clustering at community level (the unit of intervention) at the 5% level. (3) All impact estimates generated from difference-in-difference regressions with instrumental variables.. (4) All specifications for child/student level dependent variables include individual controls such as age, gender, caste/ethnicity, and household controls such as household size and welfare quintiles.

In the case of system efficiency, as measured by grade progression and repetition, the estimates suggest important gains for community managed schools as well, relative to those that chose to remain under regular management structure. The average treatment effect on grade progression rate is 15.6 percentage point increase, and that on repetition rate a 10.6 percentage point decrease, both substantial in magnitude.

Official community management is assumed to induce greater inclusion, oversight, and accountability. Our impact estimates on these measures are, however, quite mixed. On the one hand, community managed schools show positive *net* gains in two aspects: making sure they have trained personnel for proper record-keeping of financial matters (almost 50 percentage points increase) and for recruiting new female teachers (45 percentage points), which was one of the stated objectives of the program as well. On the other hand, there is virtually no effect on reducing teacher absenteeism, and while community managed schools are more likely to promote school monitoring committees, the impact estimate is not statistically significant.

The regional variation in these governance variables is more interesting from an institutional perspective. Nepal is divided into three agro-ecological regions – Mountain, Hill, and Terai (low-lands). As previously mentioned, the original community school movement in the 1950s was centered in the high-land regions of Nepal. As seen in Table 4 above, the impact of community management is much more pronounced in hilly and mountain districts. On the other hand, impact estimates from the Terai districts are either negative or insignificant. For example community managed schools in the Hill/Mountain region are 50% more likely to set up a committee monitored by parents, while the impact is insignificant in the Terai. The most profound difference is regarding teacher absenteeism – while there is a 13% drop in teacher absenteeism in community-managed schools in the Hill/Mountain region, there is disturbingly large increase in absenteeism in the Terai. Neither coefficient is significant, however, we still highlight the difference in magnitude/sign to also highlight the fact of another dimension which we have abstracted away from in this study – politics. While the overall political situation in Nepal remains contentious despite the end of the civil-war, the situation in the Terai is relatively more volatile. We should note that these results should be viewed as more qualitative in nature since the sampling was not designed to be representative at the regional level, and the regional-specific sample size is small. However, the magnitude and signs of these estimates suggest that community ownership and intended benefits are stronger in the hills and mountains of Nepal. Given the context in which hilly/mountainous communities have been historically involved in service delivery, this finding is not surprising. More detailed quantitative and qualitative research is needed to further unlock regional specific variation in outcomes. The population in both the hills and low-lands is quite heterogeneous (in terms of ethnicity and language),however, communities in the hills have been able to circumvent the cultural fault-lines to provide a plethora of services. For example there is an entire coda of institutional economics associated with Elinor Ostrom who started out her research many years ago looking at community management of irrigation systems in the highlands of Nepal[11]. Again, why this type of collective action has not been documented in the low-lands, and how this affects the community transfer initiative, needs detailed ethnographic research combined with more empirical rigor.

Even though improving the quality of education was not an explicitly stated objective of the devolution reform, in our qualitative surveys[12] we asked open-ended questions to various stakeholders in the community as to what were the main reasons for switching to community management. The majority of SMC members and head teachers in the surveyed schools said that the primary reason for switching was to "increase education quality" in the long run. Indeed, it takes a long time, not to mention substantial quality-specific interventions to improve learning outcomes. Also, we only have a two year gap between the intervention and follow-up survey, which is not ideally suited to capture meaningful effect on school quality. With these caveats in

---

[11] Nepal also had a long history of community managed forests – before management was appropriated by the state around the same time schools were nationalized.

[12] Conducted in parallel with the quantitative surveys. We do not describe these surveys and focus-group interviews with parents/community members, teachers/unions in this paper.

place, we present the results from the impact on learning outcomes in the bottom on Table 4. Average effect of the community management on curriculum-based test scores in Nepali language and mathematics, and on TIMSS-based test scores in mathematics and science, are not statistically significant. It should also be noted that the school-based test estimates are most probably biased downwards given the fact that community-schools are better able to attract/retain children from marginalized households.

7. Conclusion

The program in Nepal to devolve school management responsibility to local communities is one of the most ambitious experiments ever undertaken in the School-Based-Management (SBM) genre of reforms. Even compared to the region, provision of schooling in Nepal has a short history. Almost all schools in Nepal started out as community schools managed and financed by the community as part of an organic movement following the overthrow of an autocratic regime which failed to provide schooling to the overwhelming majority of Nepalese. Subsequently the state nationalized these schools in the early 1970's taking over management and fiscal responsibility. It is important to bear in mind that even when schools were nationalized, the state was really only focused on funding given that like in many developing countries, the government often has limited oversight over what is actually happening at the school-level. The reform program should be viewed in that de facto reality – to hopefully see improvements from formalizing community involvement in essentially a management vacuum.

In this study we use an innovative evaluation design in which we introduce an exogenous source of variation to tease out the causal (short-run) impact of community school management on a range of outcomes. The impact estimates suggest that community management improves access and equity. The impact on internal school governance is mixed, underlying the importance of path-dependent institutional factors. There is no significant impact on learning outcomes, underlying the fact that improvements in quality take a long time, and other school and household conditioning factors are critical in shaping learning outcomes.

Adjusting to a new system takes considerable amount of time. Communities are gradually taking over a system in which previously there was very little accountability. In theory, teachers were accountable to a state far removed – in reality the only substantial relationship between the state and the teacher was that involving payment. We note that while official transfer of management responsibility to the community has not been a panacea, on average, it is improved certain outcomes (in terms of access and equity). Future follow-up surveys and research will be required to document whether communities were able to continue to steer the schools towards the right direction (e.g., teachers showing up to class more regularly, improvement in pupil learning). A thousand flowers have already started to bloom after this reform imitative. For example, we note another organic movement during our fieldwork – some community schools are coming together on their own to share management experiences and learn from each other. One of our future reach agenda is to evaluate the impact of connecting community schools to this knowledge sharing network[13]. Not all flowers all appealing. In particular, careful exploration on the interaction of devolution and political volatility is important. All devolution initiatives are ultimately political. It is important that the full range of social science research is coupled with impact evaluation econometric analysis to help inform both policymakers and researchers on the complexity of school based management.

---

[13] We have already started qualitative work on this agenda.

References

Barrro, Robert S. 2001. "Human Capital and Growth." American Economic Review 91(2): 12-17.

Besley, Timothy J., and Stephen Coate. 2003. "Centralized versus Decentralized Provision of Local Public Goods: A Political Economy Analysis." *Journal of Public Economics* 87(12): 2611-37.

Case, Anne (2005) "The Primacy of Education," in Abhijit Banerjee, Roland Benabou and Dilip Mookherjee (eds.) *Understanding Poverty*, Oxford University Press.

Chaudhury, Nazmul, Jeffrey Hammer, Michael Kremer, Karthik Muralidharan, and F. Halsey Rogers (2006); "Missing in Action"; *Journal of Economic Perspectives*, vol. 20, issue 1, pages 91-116.

Chaudhury, Nazmul and Shantayanan Devarajan (2006); Human Development and Service Delivery in Asia; *Development Policy Review*, 2006, 24 (s1): s81-97; Oxford.

Das, Jishnu, Pandey, Priyanka and Zajonc, Tristan; Learning Levels and Gaps in Pakistan (November 1, 2006). World Bank Policy Research Working Paper No. 4067.

Glewwe, Paul, and Michael Kremer. 2006. "Schools, Teachers, and Education Outcomes in Developing Countries." In Hanushek, E., and F. Welch.Eds., *Handbook on the Economics of Education Vol. 1*. North-Holland.

Gordon, Robert, Thomas J. Kane, and Douglas O. Staiger. 2006. "Identifying Effective Teachers Using Performance on the Job". Discussion Paper 2006-01. The Brookings Institution.

Hanushek, Eric A. 2003. "The Failure of Input-based Schooling Policies." Economic Journal 113(485).

Hanushek, Eric A., and Dennis D. Kimko. 2000. "Schooling, Labor Force Quality, and

Todd, Petra and Wolpin, Kenneth (2003) "On the Specification and Estimation of the Production Function for Cognitive Achievement", *Economic Journal¸* 113: 64-98.

Galiani, Sebastian, Paual Gertler, and Ernesto Schargrodsky. 2004. "Helping the Good Get Better, but Leaving the Rest Behind: How Decentralization Affects School Performance." Mimeo, World Bank.

Gunnarsson, Louise Victoria, Peter Orazem, Mario Sanchez, and Aimee Verdisco. 2004."Does School Decentralization Raise Student Outcomes? Theory and Evidenceon the Roles of School Autonomy and Community Participation." WorkingPaper 04005, Iowa Stata University Depart of Economics.

Hammer, Jeffrey, Yamini Aiyar, and Salimah Samji (2006); Bottom's up: To the role of Panchayati Raj, Institutions in Health and Health services; Social Development Papers #9

King, Elizabeth, Berk Ozler, and Lawra Rawlings. 1999. "Nicaragua's School Autonomy Reform:
Fact or Fiction?" World Bank Working Paper on Impact Evaluation of Education Reforms 19.8; World Bank; Washington DC.

Kremer Michael, and Christel Vermeersch. 2005. *School Committee Empowerment: Preliminary Notes.* Mimeo, Harvard University.

Lant Pritchett and Varad Pande (2006); Making Education Work For Idia's Rural Poor: A Proposal for Effective Decentralization; Social Development Papers #95; World Bank; Washington DC.

Rouse, C. E., and Alan B. Krueger (2004); "Putting computerized instruction to the test: a randomized evaluation of a ''scientifically based'' reading program"; *Economics of Education Review,* vol. 23, pages 323-338.

Summers, Anita A., and Amy W. Johnson. 1996. "The Effects of School-Based Management Plans." In Eric A. Hanushek and Dale W. Jorgenson. Eds. Improving America's Schools: The Role of Incentives. Washington, DC: National Academy Press.

Annex table 1: Reduced form Regressions for Access, Equity and Internal efficiency

	Out of School Status	Out of School status for disadvantaged group	Grade Progression	Grade Repetition
Advocacy * Second Round	-0.040** [2.42]	-0.049** [2.55]	0.039** [2.47]	-0.030** [2.10]
Advocacy	0.016 [0.67]	0.014 [0.49]	-0.024* [1.75]	0.020* [1.68]
Second Round	-0.001 [0.11]	0.001 [0.03]	0.001 [0.10]	0.001 [0.00]
Age	-0.171** [2.62]	-0.183** [2.19]	0.134** [18.44]	-0.030** [5.57]
Age-squared	0.007 [1.30]	0.007 [1.06]	-0.006** [17.31]	0.001** [4.49]
Female	0.032** [4.93]	0.040** [4.94]	-0.003 [0.60]	0.003 [0.63]
Advantaged ethnic/caste groups	-0.071** [6.16]		0.042** [5.61]	-0.033** [4.97]
HH Size (log)	0.024** [2.54]	0.012 [1.09]		
Asset Quintile 2	-0.039** [2.84]	-0.038** [2.31]	0.020* [1.81]	-0.013 [1.33]
Asset Quintile 2	-0.088** [6.31]	-0.099** [6.05]	0.018 [1.42]	-0.007 [0.62]
Asset Quintile 2	-0.081** [5.03]	-0.099** [5.11]	0.022 [1.45]	-0.011 [0.84]
Asset Quintile 2	-0.125** [8.31]	-0.142** [7.78]	0.051** [3.54]	-0.029** [2.25]
East			0.023** [2.45]	-0.023** [2.81]
Terai			0.067** [5.53]	-0.052** [5.00]

Notes: 1. absolute values of t-statistics in brackets. 2. Significance levels: * p<.1, ** p<.05, ** p<.01

Annex table 2: IV Regressions for Access, Equity and Internal efficiency

	Out of School Status	Out of School status for disadvantaged group	Grade progression	Grade Repetition
Treatment * Second Round	-0.145** [1.97]	-0.166** [2.07]	0.168* [1.90]	-0.123* [1.73]
Treatment	0.06 [0.60]	0.052 [0.47]	-0.109 [1.55]	0.086 [1.53]
Second Round	0.038 [1.15]	0.044 [1.20]	-0.045 [1.14]	0.034 [1.06]
Age	-0.331** [4.60]	-0.326** [3.65]	0.154** [17.08]	-0.030** [5.32]
Age-squared	0.020** [3.44]	0.019** [2.63]	-0.007** [16.44]	0.001** [4.29]
Female	0.031** [4.53]	0.039** [4.70]	-0.003 [0.70]	0.003 [0.73]
Advantaged ethnic/caste groups	-0.063** [6.25]		0.046** [5.64]	-0.036** [5.02]
HH Size (log)	0.023** [2.42]	0.012 [1.02]		
Asset Quintile 2	-0.052** [2.54]	-0.045** [2.03]	0.018 [1.55]	-0.01 [1.10]
Asset Quintile 2	-0.115** [4.41]	-0.118** [4.27]	0.014 [0.99]	-0.003 [0.22]
Asset Quintile 2	-0.109** [3.98]	-0.121** [4.17]	0.017 [0.99]	-0.006 [0.43]
Asset Quintile 2	-0.158** [6.76]	-0.169** [6.59]	0.054** [3.11]	-0.028* [1.95]
East			0.028** [2.04]	-0.029** [2.54]
Terai			0.064** [4.80]	-0.048** [4.22]
_cons	1.457** [7.00]	1.487** [5.75]	-0.037 [0.60]	0.344** [9.48]

Notes: 1. absolute values of t-statistics in brackets. 2. Significance levels: * p<.1, ** p<.05, ** p<.01

Annex table 3: Reduced Form Regressions for Governance/Community participation

	Monitoring	Trained Persons for record keeping	Female teacher	Teacher Absenteeism
Advocacy * Second Round	0.125 [1.54]	0.152** [2.13]	0.127* [1.77]	0.012 [0.29]
Advocacy	-0.029 [0.48]	-0.023 [0.37]		0.016 [0.57]
Second Round	-0.06 [1.00]	-0.094* [1.77]		0.019 [0.53]
Female				-0.008 [0.47]
Government/Permanent Status				-0.044** [2.14]
Fully trained				0.029 [1.43]

Annex table 4: IV Regressions for Governance/Community participation

	Monitoring	Trained Persons for record keeping	Female teacher	Teacher Absenteeism
Treatment * Second Round	0.413 [1.55]	0.490* [1.91]	0.446* [1.67]	0.046 [0.33]
Treatment	-0.101 [0.47]	-0.081 [0.37]		0.055 [0.55]
Second Round	-0.157 [1.35]	-0.205* [1.81]		0.005 [0.08]
Female				-0.007 [0.38]
Government/Permanent Status				-0.040* [1.76]
Fully trained				0.03 [1.34]

		*			
_cons	0.253*	0.262**	0.292**	0.121**	
	[2.58]	[2.62]	[2.40]	[2.24]	

Notes: 1. absolute values of t-statistics in brackets. 2. Significance levels: * p<.1, ** p<.05, ** p<.01

Annex table 5: IV Regressions for Governance/Community participation, Hills and Terai Separately

	Monitoring		Female recruiting		Teacher Absenteeism	
	Hills/Mts	Terai	Hills/Mts	Terai	Hills/Mts	Terai
Treatment * Second Round	0.529**	-0.156	0.466*	0.359	-0.134	0.72
	[2.04]	[0.17]	[1.87]	[0.37]	[1.19]	[0.88]
Treatment	-0.317	0.953			0.114	-0.182
	[1.36]	[0.90]			[1.35]	[0.43]
Second Round	-0.227*	0.083			0.097	-0.269
	[1.74]	[0.24]			[1.60]	[0.81]
Female					-0.009	-0.013
					[0.33]	[0.43]
Government/Permanent Status					-0.064**	-0.009
					[2.05]	[0.26]
Fully trained					0.059**	0.006
					[2.09]	[0.14]
_cons	0.392**	-0.208	0.251**	0.375	0.094*	0.207
	[3.24]	[0.52]	[2.01]	[1.00]	[1.88]	[1.18]

Notes: 1. absolute values of t-statistics in brackets. 2. Significance levels: * p<.1, ** p<.05, ** p<.01

Annex table 6: Regressions for Standardized Test Scores in Science and Maths, TIMSS-based (Grades 5)

	Reduced form regressions			IV Regressions	
	Science	Math		Science	Math
Advocacy * Second Round	0.224**	0.033	Treatment * Second Round	1.125	0.213
	[2.25]	[0.37]		[1.49]	[0.47]
Advocacy	-0.004	0.042	Treatment	-0.016	0.166
	[0.05]	[0.46]		[0.05]	[0.48]

Second Round	-0.233**	-0.153**	Second Round		-0.566*	-0.22
	[2.92]	[2.15]			[1.70]	[1.09]
_cons	0.003	-0.028	_cons		0.007	-0.073
	[0.04]	[0.38]			[0.04]	[0.47]

Notes: 1. absolute values of t-statistics in brackets. 2. Significance levels: * p<.1, ** p<.05, ** p<.01

Annex table 7: Regressions for Standardized Test Scores in Nepali and Maths, Curriculum-based (Grades 4 and 5)

	Reduced form regressions			IV Regressions	
	Nepali	Maths		Nepali	Maths
Advocacy * Second Round	-0.107 [0.98]	-0.186* [1.68]	Treatment * Second Round	-0.432 [0.95]	-0.718 [1.49]
Advocacy	0.054 [0.47]	-0.003 [0.02]	Treatment	0.234 [0.50]	0.006 [0.01]
Second Round	-0.135 [1.44]	-0.087 [0.93]	Second Round	-0.028 [0.14]	0.093 [0.45]
Age	0.205* [1.67]	0.421** [3.33]	Age	0.197 [1.53]	0.375** [2.63]
Age-squared	-0.010* [1.81]	-0.018** [3.26]	Age-squared	-0.009* [1.66]	-0.016** [2.55]
Female	-0.121** [3.01]	-0.280** [7.35]	Female	-0.121** [3.00]	-0.285** [7.02]
Advantaged ethnic/caste groups	0.288** [4.37]	0.260** [4.30]	Advantaged ethnic/caste groups	0.281** [4.34]	0.237** [3.53]
HH Size (log)	-0.099* [1.92]	-0.057 [1.18]	HH Size (log)	-0.100* [1.92]	-0.066 [1.29]
Asset Quintile 2	-0.027 [0.25]	-0.159 [1.48]	Asset Quintile 2	-0.029 [0.26]	-0.178 [1.43]
Asset Quintile 2	0.173 [1.59]	-0.118 [1.08]	Asset Quintile 2	0.173 [1.58]	-0.136 [1.10]
Asset Quintile 2	0.115 [1.03]	-0.235** [2.07]	Asset Quintile 2	0.109 [0.96]	-0.268** [2.01]
Asset Quintile 2	0.351** [2.97]	0.022 [0.19]	Asset Quintile 2	0.348** [2.84]	0.032 [0.23]
_cons	-1.107 [1.59]	-2.084** [2.86]	_cons	-1.113 [1.42]	-1.796** [2.06]

Notes: 1. absolute values of t-statistics in brackets. 2. Significance levels: * p<.1, ** p<.05, ** p<.01