LOCAL CAPTURE: EVIDENCE FROM A CENTRAL GOVERNMENT TRANSFER PROGRAM IN UGANDA*

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According to official statistics, 20 percent of Uganda's total public expenditure was spent on education in the mid-1990s, most of it on primary education. One of the large public programs was a capitation grant to cover schools' nonwage expenditures. Using panel data from a unique survey of primary schools, we assess the extent to which the grant actually reached the intended end-user (schools). The survey data reveal that during 1991–1995, the schools, on average, received only 13 percent of the grants. Most schools received nothing. The bulk of the school grant was captured by local officials (and politicians). The data also reveal considerable variation in grants received across schools, suggesting that rather than being passive recipients of flows from the government, schools use their bargaining power to secure greater shares of funding. We find that schools in better-off communities managed to claim a higher share of their entitlements. As a result, actual education spending, in contrast to budget allocations, is regressive. Similar surveys in other African countries confirm that Uganda is not a special case.

I. INTRODUCTION

Official budget data are typically the only source of information on public spending in low-income countries. However, such information poorly predicts the resources and services intended beneficiaries actually receive. This is particularly the case in countries with weak institutions. Uganda is a case in point. Official budget sources show that Uganda spent roughly 20 percent of its total public expenditure on education in the mid-1990s, most of it on primary education. But anecdotal evidence suggests that most schools received limited public support.

In this paper we describe and analyze the results of an innovative survey tool to track the flow of public resources to intended destinations. We focus on a large public educational program in Uganda—a capitation grant to cover schools' nonwage expenditures—financed and run by the central government, using district offices as distribution channels. The empirical strat-

egy entailed comparing disbursed flows from the central government (intended resources) with the resources actually received by schools. Two hundred fifty primary schools were surveyed, and data on receipts were collected for 1991–1995. This unique panel data set allows us to study the level and determinants of local capture.

The results of the survey are striking. On average, schools received only 13 percent of central government spending on the program. Most schools received nothing. The bulk of the grants was captured by local government officials (and politicians). The data also reveal large variations in grants received across schools. We study the determinants of this variation and show that actual spending, unlike budget allocations, is regressive: schools in better-off communities experience a lower degree of capture. Similar surveys in other African countries confirm that Uganda is not a special case.

The contribution of this paper is twofold. First, we develop and implement a simple empirical methodology to quantitatively assess local capture in basic service delivery systems in a poor developing country.[1] The finding that a large part of the schools' entitlement is captured has obvious implications. For example, it highlights the identification problem in attempting to evaluate the efficacy of public capital or services using official budget data. Such an exercise cannot distinguish between the case where public capital or services actually created by public funds are highly productive, but the supply system is not, and the case where the supply system is effective but the goods and services being produced yield few benefits. Based on existing cross-country work, the effects of government spending (or foreign aid) on growth and social development outcomes are indeed ambiguous.[2] An important explanation for this lack of correlation is poorly functioning systems of service delivery in many developing countries, implying that increased spending (foreign aid) does not

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1. On quantifying corruption, see Svensson [2003] and references therein.
2. On the relationship between government expenditures and growth, see Alesina [1999], Barro [1991], Kormendi and Mequire [1985], Landau [1986], Levine and Renelt [1992], and Ram [1986]. On the relationship between aid and growth, see Boone [1996], Burnside and Dollar [2000], and Hansen and Tarp [2001]. On the relationship between public expenditure and human development outcomes, see Filmer and Pritchett [1999]. The empirical growth literature is abundant in explicit (and implicit) attempts to separate productive spending from expenditures with no direct effect on productivity (e.g., by ex ante determining what types of spending are likely to be productive, see Barro [1991]). But partitioning expenditure categories does not address the core problem—that public funds may not reach the intended end-user.

necessarily translate into increased output and services. More generally, the findings stress the need to focus on the delivery system in developing countries to gain a better understanding of the impact of public spending.

Second, we show that a large part of the variation in local capture can be explained by studying the interaction between local officials and schools as a bargaining game. Our finding that the schools' socioeconomic endowment matters, for the degree of local capture suggests that schools use their bargaining power vis-à-vis local governments to secure greater shares of funding. Local capture has thus obvious equity implications. Specifically, poor students suffered disproportionately because schools catering to them received even less funds than others. The finding that local capture is systematically related to the users' socioeconomic status has implication for benefit incidence analysis, one of the core evaluation methods used to assess the distributional impact of public spending. Benefit incidence analysis combines household data on consumption of public services with the cost of providing them, based on public expenditure data.[3] A benefit incidence analysis was carried out in Uganda by the World Bank in 1996. It showed that in primary education the share of the total benefit accrued to the poorest quintile was about the same as the richest quintile of households, suggesting benefit incidence to be neutral. However, when using data on actual public spending reaching schools, the benefit incidence is very different: schools in poor communities received nothing (or very little), schools in wealthier communities received some, while local officials and politicians benefited most.

The rest of this paper is structured as follows. The next section briefly reviews the institutional setting for school finance and decision-making in Uganda. Section III discusses the survey and the measurement of local capture. Section IV outlines the empirical model, and the results are presented in Section V. Section VI discusses the results from similar surveys conducted in other Sub-Saharan African countries, and Section VII concludes.

II. INSTITUTIONAL SETTING

It is commonly held that Uganda had a well-functioning public service delivery system in the 1960s. The government

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3. The benefit incidence analysis dates back to work by Brennan [1976], Merman [1979], and Selowsky [1979]. For a recent review of the literature, see Demery [2003].

response to the political and military turmoil of the 1970s and early 1980s was de facto to retreat from funding and providing public services. In primary education, parents gradually took over the running of public schools. The survey data indicate that by 1991, this situation still remained quite unchanged. Parent-teacher associations (PTA) were the primary decision-makers at the school level, and funding by parents was, on average, the most important source of income.

While the subsequent economic recovery increased public spending relatively rapidly, institutional reforms were much slower. In particular, the central government exercised weak supervision over the execution of most public programs.

During the survey period (1991–1995), the central government's financial contribution to primary education was threefold. First, the Ministry of Public Service paid the salaries of primary school teachers either directly, if the teacher had a bank account, or most often through the district education officer or the headmaster. Second, there was a national policy of financing instructional material and other nonwage spending at primary schools through a capitation grant. The grant was a nationally set annual allocation per student and was intended to go to the schools. The district offices under the Ministry of Local Government (MOLG) were used as distribution channels. Third, the central government provided funding for capital expenditure through the MOLG. This funding was almost entirely limited to rehabilitation. In fact, since the 1970s, the central government had virtually abandoned its responsibility for classroom construction.

The central government's total contribution (per student) to the primary education sector increased by 40 percent in real terms between 1991 and 1995, albeit from a negligible base (Appendix 1). In practice, the entire increase was used to raise teachers' salaries, which had eroded to extremely low levels (equivalent to a few US dollars a month) during the institutional and economic collapse of the 1970s and 1980s. In 1991 the capitation grant was set at the nominal rate of Ugandan Shillings (USh) 2,500 per child enrolled in grades one to four and USh 4,000 per child enrolled in grades five to seven. It was retained at the same nominal level throughout the survey period and, therefore, its real value actually declined. There was an increase in spending on rehabilitation and school construction toward the end of the survey period. Over the period 1991–1995, the capita-

tion grant program constituted 23 percent of total government spending on primary education.

Uganda implemented cash budgeting in 1992 which, in many cases, produced volatile monthly releases of funds from the Treasury. However, as part of the World Bank's structural adjustment programs, nonwage recurrent expenditures for primary education were given a priority program status, which protected schools from within-year budget cuts.

The central government's policy regarding the capitation grant was not well-known to parents, particularly outside the capital. Even if parents knew about the policy in principle, many similar policy statements were not implemented in practice at that time. Little information was available to the public, for example, on the spending items protected within the cash budget system. Local officials and politicians could take advantage of the gap in information; they could reduce disbursements or procure little for nonwage items to schools because they knew such actions would not attract political attention. In contrast, the failure to pay teachers would attract much more attention as, not surprisingly, teachers knew the size of their salaries.

While it was not possible to extend the public expenditure tracking survey to teacher salaries (salaries were not disaggregated by primary, secondary, and administrative staff, by the Ministry of Public Service), a simultaneous cleanup of the teacher payroll revealed that 20 percent of salaries in 1993 were paid to "ghosts," i.e., to teachers who did not exist [Reinikka 2001].

As shown in Appendix 1, parental contributions toward primary education consisted of PTA levies for investment and recurrent costs, top-ups to teachers' salaries, and tuition fees. The PTA fees and top-ups to teachers' salaries were entirely school-specific and set by each school's PTA, depending on the parents' ability to pay and the needs of the school. Parental contributions were clearly the mainstay of finance in government-aided primary schools. On average, parental contributions accounted for over 60 percent of total expenditures in primary education during the sample period. In per-student terms, parents' average contribution increased by 33 percent in real terms during this period.

Teacher recruitment was carried out by district education service commissions on behalf of the national teacher service commission. Recruitment was supply driven, as all new teachers graduating from primary teacher colleges were usually hired. Although teachers were hired by the districts, their payroll was

maintained by the central government. As a result, and contrary to nonwage spending, the central government provided some supervision for teacher recruitment and salaries through the maintenance of the national payroll. Once recruited, the district education officer posted the teacher to a specific school. Hence, teachers had little opportunity to choose the school where they taught. If the demand for teachers exceeded the supply of training colleges, district education service commissions recruited additional "licensed" teachers, who were often unqualified.

The PTA derived its authority from parents. A typical PTA was run by an executive committee with about six members elected at a general meeting, and the headmaster.

III. Quantifying Capture

In the ideal case, a country's public accounting system provides timely information about actual spending on various budget items and programs, and the reports accurately reflect what the intended users receive. This is not often the case in low-income countries, where the accounting system may function poorly, institutions enhancing local accountability may be weak, and there are few incentives to maintain adequate records at different government levels. Consequently, little is known about the process of transforming budget allocations into services within most sectors.

These observations formed the basis for designing a new survey tool—a public expenditure tracking survey—to gauge the extent to which public resources actually filtered down to facilities.[4] A survey of 250 government primary schools was implemented in 1996, covering the period 1991–1995 (see Appendix 2 for details on survey design). At the time of the survey, about 8,500 government primary schools were supposed to receive a large proportion of their funding from the central government via district administrations.[5]

The objective of the survey was twofold. First, it measured the difference between intended resources, i.e., the capitation grant (from the central government) and resources actually re-

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4. For a conceptual discussion on public expenditure tracking and other similar surveys, see Dehn, Reinikka, and Svensson [2003].
5. The 1,500 private or community schools were not included in the survey, nor were boarding schools.

ceived (by the school). Second, it collected quantitative data on service delivery at the schools.

Focusing on the capitation grant program had two advantages. First, like most public programs at that time, the capitation grant was a national program where local (district) offices were used as distribution channels. This gave local officials and politicians the opportunity to capture funds. Second, unlike other government programs, the capitation grant was a rare liquid money infusion into a local administrative and political system, thus facilitating the capture of funds. Other public programs were primarily in-kind (for instance, health clinics were provided with drug kits directly from the central government).

The survey collected data from central ministries, local governments (districts), and schools. Detailed records were available at both the central level and at the schools. At the district level, the survey team was able to obtain bookkeeping information on receipts from the central government at the offices of the chief administrative officer and the regional audit representative. But these offices lacked reliable records of disbursements to individual schools.

Our school-specific measure of capture is

$$(1) \qquad \frac{\text{capitation grants received}}{\text{intended capitation grants from the center}},$$

where a low value indicates extensive capture.[6]

There are several reasons to believe that the capitation grant data at the school level adequately reflect what the schools actually received. First, the survey collected data directly from the school records using a uniform instrument for each year. These records were kept for the schools' own needs. The school records were not submitted to any district or central authorities and did

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6. In principle, the denominator in (1) should be the product of the number of pupils in the school and the annual per-student capitation grant. In practice, however, for the entire survey period (1991–1995), the capitation grant was determined on the basis of 1991 enrollment, obtained from a school census implemented that year (the first school census since the 1986 military takeover). In the following years, national primary enrollment data were collected administratively by the Ministry of Education, which sent questionnaires to all schools through local governments. The Ministry seems to have treated these results with some suspicion as it continued to use the 1991 enrollment figures in determining capitation grant disbursements. This implies that the growth in enrollment observed at the school level in our survey did not result in increased "intended capitation grants from the center" for the schools. For these reasons, we derive the denominator in (1) using 1991 enrollment data.

not constitute the basis for current or future funding. Thus, there were no obvious incentives to misrecord the data. At the same time, parents contributing the majority of school income demanded financial information and accountability from the school (or PTA), so school records were usually relatively well kept. Most of the public resources received were in-kind (textbooks, stationery, chalk, etc.). The information on all these inputs was collected from school records and subsequently valued (using market prices). The concern that headmasters might have underreported school income in order to extract resources for themselves was allayed after interviews during the survey work, which did not support this claim. This is not surprising since the PTA was typically the principal decision-maker and responsible for raising most of the income at the school.

Monthly reports from the Uganda Computer Centre, based on issued cheques, reveal that the capitation grants were fully released by the central government on a monthly basis.[7] In the Ugandan treasury system, central ministries or individuals were unlikely to be able to capture central releases since they were subject to relatively elaborate pre-audit procedures. In addition, since the capitation grant program was given a priority program status as part of the World Bank's structural adjustment programs, the releases from the center were also externally audited (by World Bank staff). Most importantly, records at the district level confirmed that the disbursed amounts were actually received by the districts.

Did public resources reach the intended schools? Table I depicts information on the capture variable, the *share of intended capitation grants received.* On average, only 13 percent of the total yearly capitation grant from the central government reached the school. Eighty-seven percent either disappeared for private gain or were used for purposes unrelated to education. A majority of schools received nothing. Based on yearly data, 73 percent of the schools received less than 5 percent, while only 10 percent received more than 50 percent of the intended funds.

The picture looks slightly better when constraining the sam-

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7. In most cases, 100 percent and always well over 90 percent of the funds were released. The procedure at the time was that the Ministry of Local Government (MOLG) would receive funds for the capitation grants from the Ministry of Finance into their account, and, in turn, the MOLG would have a Uganda Commercial Bank (UCB) cheque prepared for each district. The districts would simply collect their cheques from the MOLG and deposit them into their account with a branch of UCB in their district.

TABLE I
SHARE OF INTENDED CAPITATION GRANT RECEIVED

	Mean	Median	St. dev.	Max	Min	Obs
All schools						
1991–1995	12.6	0	26.7	115.9	0	944
1995	21.9	0	33.7	108.9	0	208
Regions						
North	11.5	0	22.8	104.4	0	136
West	11.8	0	25.4	109.8	0	143
Southwest	8.1	0	23.7	101.6	0	131
Northwest	7.6	0	22.8	105.9	0	101
East	11.4	0	25.6	107.2	0	137
Northeast	17.5	0	27.2	108.9	0	146
Central	18.3	0	34.3	115.9	0	150
Region-year average	11.8	0	9.2	36.8	0	35

a. In percent.

ple to the last years of the sample period. Still, only 22 percent of the total capitation grant from the central government reached the schools in 1995.

The fact that only limited funds reached the schools does not preclude the possibility that funds were reallocated to other areas that local officials considered legitimate priorities in their districts and that they were acting in a context where everybody considered this to be legitimate.[8] In particular, this could be expected since the program was exempt from budget cuts, unlike many other public programs at the time. However, available evidence suggests this not to be the case. First, as discussed below, most schools (teachers and parents) did not know they were entitled to capitation grants (and thus could hardly consider the local officials' actions to divert these funds to be legitimate). Second, there was no evidence of increased spending in other sectors [Jeppson 2001; McPake et al. 1999]. Finally, household survey data suggest that most households prioritize increased spending on education [Azfar et al. 2000; Stasavage 2003].

Although there is indirect evidence that part of the leakage

8. Another possibility would be that funds could not be disbursed to the schools for some bureaucratic reason, implying that the problem was not capture. However, this did not seem to be the case. No district reported that they had unspent capitation grants, which under budget procedures should have been sent back to the Treasury through the MOLG. Moreover, no district returned money to the MOLG during the sample period.

was theft, as indicated by numerous newspaper articles about indictments of district education officers after the survey findings went public, anecdotal evidence suggests that funds were largely used for patronage politics and the funding of political activities. For example, information collected during the survey suggests that funds were used to increase allowances for councillors and local officers and that on the day funds actually arrived in the district, well-connected citizens and local politicians got together with the district officials to decide how these should be used.

These anecdotes are consistent with case study evidence of (local) political financing and corruption in Uganda, as reported in Thomas [1998, 1999]. Thomas argues that the power in local governments is concentrated to a small pool of elites interconnected by common schooling, marriage, friendships, shared ethnicities, or religion. Sustaining this power balance is costly, and public funds are fueling a system of patronage politics, where patrons give clients material rewards for their political loyalty and services (see also Bayart [1993]). The patronage system takes different forms, including government actors diverting public resources for their own campaigns and those of friends and family, and financing of local and private causes, including distribution of private goods such as salt, sugar, and beer to neutralize voter dissatisfaction. Political parties, in the case of Uganda "The Movement," must also supply patronage goods to their workers and members.[9] In a rural setting, an important way of maintaining an effective political organization is through personal presence, which means a well-staffed institutional hierarchy all the way down to the village level. This model assumes substantial resources, and diversion of public resources is often the only source of funding available.

Another concern with the capture measure in (1) is data quality. As reported above, since parents demanded financial accountability from the school (PTA), and given that the data were collected directly from the school records, we do not believe there to be any systematic misrecording. Five of the 250 schools surveyed lacked records and had to be dropped from the sample. Another 60 schools had some missing records at least for one year

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9. The National Resistance Movement is not a party officially, although it operates like one, and its institutional structure is similar to other dominant party structures in other parts of Sub-Saharan Africa, with a National Executive Committee, a Secretariat, and District, Division, Sub-County, Town, Parish, and Village Movement Committees.

during the survey period, and 5 of these lacked financial records altogether. As a preliminary test of systematic misrecording, we can compare the observable characteristics of these 60 schools with the rest of the sample. In Appendix 4 we report a set of regressions using observable school characteristics, such as average school size (number of students), share of qualified teachers, and community income as dependent variables (all variables are defined in Appendix 3). The regressor is a dummy variable taking the value of 1 for schools with missing records for at least one year during the survey period.[10] As is evident, the group of schools with some missing records does not differ significantly either in income or school quality (as measured by the share of unqualified teachers), although there is some evidence that smaller schools are less likely to have records for the whole survey period.[11]

As illustrated in Table I, capture varies across regions, although the bulk of the variation is within regions.[12] A variance decomposition shows that 83 percent of the variation in capture are due to variation within districts, while 17 percent are due to variation across districts. In the next two sections we attempt to account for this variation within (and across) regions.

IV. A FRAMEWORK FOR STUDYING VARIANCE IN LOCAL CAPTURE

Although, on average, a small share of nonwage spending reached the schools, there is variation in the 13 percent (22 percent in 1995) that actually ended up in the schools. How can this variation be explained?

Consider a community j, $j \in J$, with income y_j. The community has a school which is entitled to a grant g_j. However, the community cannot verify (without a costly effort) if these funds have been released by the central government. It only knows that

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10. Not all schools were operating in all five years covered in the survey.
11. It still may be the case that poorer schools, or schools in poorer communities, have worse records, in particular no records on transfers from the center. However, for only about 10 percent of the school-year observations for which no public funds were recorded, were there also no records of funds from private sources, thereby suggesting that this was not the case. The lack of correlation between the quality of records and school income was also reconfirmed by the qualitative information collected during the interviews.
12. The degree of capture is not significantly different in the North, West, Southwest, Northwest, and East regions. Capture is significantly lower (at the 5 percent level) in the Central region compared with the other six regions. The Central region also has a significantly higher average income.

g_j is distributed on the interval [0,1], according to the distribution function $F(g)$.

The grant program is executed at the local level by district officers. The district officials have discretion over the use of the funds and will disburse s_j to school j. While the district officials might care about education, we assume that they have more urgent needs for the funds (such as financing political campaigns, increasing the remuneration of local administrators, or simply increasing their own consumption; i.e., corruption). Thus, the local officer will attempt to capture (in expected terms) as much of the public funds as possible. Formally, the district official maximizes $EU^o = E \sum_{j=1}^{J} (g_j - s_j)$.

The timing of events is as follows. First, the district officer receives g_j from the government to be passed on to school j. Second, the school receives an offer $s_j \leq g_j$ from the district official. The community/school can either accept or reject the offer. In case it rejects the offer, it can attempt to verify what the district officer has received and exercise its voice option (launch a protest). Voice can take many forms (see Hirschman [1970]), including individual or collective petition or appeal to a higher authority, including local chiefs, or through various types of actions and protests. There is a cost $c_j \geq \underline{c}$ for verifying what has been disbursed by the government and to launch a protest. A protest is successful with probability $\pi(c_j)$, in which case the school receives g_j and the district official must pay a fine, $\varphi > 0$. The protest is unsuccessful with probability $1 - \pi(c_j)$, in which case the school will end up with s_j. We assume that $\pi(c_j) \in (0,1)$, $\pi' \geq 0$, $\pi'' \leq 0$ for $c_j \geq \underline{c}$, and $\pi = 0$ otherwise.

How much of the intended funds will the district official transfer to the school? Consider first the community. It forms an estimate of g_j, say g_j^e, based on s_j. Thereafter, it determines whether or not to verify the amount being disbursed by the government and to protest. The optimal amount of funds, c_j^*, spent on a verification/protest is found by maximizing the expected returns $\pi(c_j)g_j^e + (1 - \pi(c_j)) s_j - c_j$; that is, $c_j^* = \min[\bar{c}_j, y_j]$ if $y_j \geq \underline{c}$ and $c_j^* = 0$ otherwise, where $\bar{c}_j = \pi_c^{-1}[1/(g_j^e - s_j)]$. Thus, the community will verify g_j and protest if $\pi(c_j^*)g_j^e + (1 - \pi(c_j^*)) s_j - c_j^* > s_j$.

Consider next the district official's problem. It can always choose a s_j, say s_j^*, to ensure that no action will be taken by the community. A sufficient condition for s_j^* to be an optimal response is that φ is large. Extracting more resources than $(g_j - s_j^*)$ will
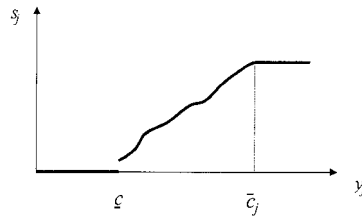
FIGURE I
Spending Reaching the School as a Function of Community Income

result in the community investing c_j^* and protesting, which yields a strictly lower expected utility for the district official. By extracting less, the official simply gives up rents to the school. Note that s_j^* is a nonnegative function of income; i.e., actual spending is regressive, and that $s_j^* = 0$ if a community's income is too low; i.e., $y_j < \underline{c}$.[13] In equilibrium, $g_j^e = g_j$. Funding, s_j^* as a function of income is illustrated in Figure I.

We can test the implications of the bargaining hypothesis by estimating the following regression:

$$(2) \qquad \log(1 + s/g)_{jt} = \beta_0 + \beta_1 \log income_{jt} + \boldsymbol{\gamma}' \mathbf{x}_{jt} + \varepsilon_{jt},$$

where $(s/g)_{jt}$ is the share of grants received by school j at time t in relation to what it should have received, *income* is a measure of the community's income and $\mathbf{x}_{jt}$ a vector of controls. The bargaining hypothesis suggests that $\beta_1 > 0$.

Our measure of community income is created using household expenditure data.[14] Specifically, we use data from the 1992 Integrated Household Survey to derive the mean consumption levels in 1992 at the district-urban-rural location. Subsequent household surveys were used to derive annual regional growth rates over the period, broken down by urban and rural. Combining these data, we could derive our income variable: the mean consumption levels across district-urban-rural locations in 1991–1995. Note that the district-urban-rural location has no administrative or political boundaries. This will mitigate the danger that *in-*

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13. s_j^* is implicitly defined by the equation $\pi(c_j^*)g_j + (1 - \pi(c_j^*))s_j^* - c_j^* - s_j^* = 0$. Differentiating this expression, using the fact that $c_j^* = y_j$ if $y_j \leq \bar{c}_j$, we find that $ds_j^*/dy_j > 0$.
14. We wish to thank Simon Appleton for providing some of these data.

come is picking up some political process at the district level that could have a direct bearing on the degree of local capture.

In the baseline specification the vector of controls includes a measure of school quality (share of qualified teachers in the school), and school size. Both variables are time-variant. Clearly, there are many other school characteristics that may be of importance (and be correlated with *income*), such as the headmaster's competence to articulate their case to the district officials, social cohesion in the school or community, ethnic composition, and whether the school is located in an area supporting the (local) government in power.[15] Our strategy for dealing with these partially unobserved school characteristics is to exploit the panel dimension in the data set. Assuming that these additional variables can (in the short run) be treated as fixed, they can be controlled for using a school-specific effect η_j.

The baseline specification is thus

$$(3) \quad \log (1 + s/g)_{jt} = \beta_0 + \beta_1 \log income_{jt} + \beta_2 \log school\ quality_{jt}$$
$$+ \beta_3 \log students_{jt} + \eta_j + \mu_t + \varepsilon_{jt},$$

where μ_t is a time-specific effect.

V. RESULTS

Before proceeding, it is useful to take a look at the sample of schools. Descriptive statistics are reported in Appendix 5. In the sample, the average school size is 486 students. There are large variations, however, with the smallest school having 35 students, and the largest roughly 100 times as many. The average student/teacher ratio is 32, with 68 percent of the teachers being qualified. Thirty-four schools (14 percent) reported that they did not have any qualified teachers for at least one year during the sample period, while only one school had qualified teachers only during the whole sample period.

The average community income (i.e., the mean consumption

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15. Studies on the role of social networks in overcoming coordination problems and reducing transaction costs in developing countries include Narayan and Pritchett [1999] and Wade [1988]. To the extent that ethnic ties proxy for social networks, Miguel [2000] argues that ethnically diverse communities are less able to ensure enough social pressure for sustaining primary school contributions in rural western Kenya. In related work, Gugerty and Miguel [2000] show that higher ethnic diversity is associated with lower community participation in school meetings.

level per adult equivalent) is 5,803 USh in 1989 prices, which corresponds to 1.92 US dollars per capita per day in PPP adjusted 1995 prices (0.47 US dollars at the official 1995 exchange rate). There are large variations in income. Community income in the top decile is four times higher than the average income in the bottom decile.

We start by looking at the simple relationship between local capture and income, recognizing that there are several econometric issues that have not yet been addressed. These concerns are dealt with next.

Table II, column (1), reports a pooled cross-section regression, i.e., equation (3) with only *income* and district dummies as explanatory variables. *Income* enters with a positive sign and is significant at the 1 percent level, suggesting that schools in poorer neighborhoods suffer disproportionately from local capture. In column (2) the additional controls are included. The coefficient and significance level on *income* remains unchanged. School size and share of qualified teachers are also positively correlated with the share of funding reaching the school (not reported).

Column (3) reports the results of estimating (3) with fixed-effects least squares. If the school-specific effects are correlated with income, the coefficient on *income* in column (2) suffers from

TABLE II
EXPLAINING CAPTURE ACROSS SCHOOLS

Specification	(1)	(2)	(3)	(4)	(5)
Time	1991–1995	1991–1995	1991–1995	1991–1995	1991–1995
Method	OLS	OLS	FE	ML	ML
Income	1.92	1.90	7.63	25.8	5.68
	(.678)	(.664)	(1.33)	(2.78)	(2.86)
	[.005]	[.005]	[.000]	[.000]	[.047]
District dummies	Yes	Yes	No	No	No
Controls	No	Yes	Yes	Yes	Yes
School fixed effects	No	No	Yes	Yes	Yes
Time effects	No	No	No	No	Yes
No. schools	239	239	239	239	239
No. obs.	944	940	940	940	940
Adj. R^2	.01	.02	.60	—	—

a. The dependent variable is "share of intended capitation grant received"; all explanatory variables are in logarithms.
b. Control variables are "school size" and "school quality."
c. Standard errors clustered at the school level are in parentheses, and *p*-values are in brackets.

omitted variable bias. The result in column (3) suggests this to indeed be the case. The coefficient on *income* increases sharply and is highly significant.

We ran two specification tests on the regression reported in column (3). First, we tested the null hypothesis that all school-effects (η_j) are equal. The *F*-ratio is 4.30 and significant at the 1 percent level. We also tested the hypothesis that η_j and the explanatory variables are uncorrelated, i.e., a test for fixed or random effects. The Hausman [1978] test statistic is 140.2 and is also significant at the 1 percent level; that is, both hypotheses can be soundly rejected, thus providing support for our choice of a fixed-effects estimator.

The findings reported in Table II lend support for the bargaining hypothesis. Schools in well-endowed areas suffer less from capture as the communities have the resources to acquire information on entitlements and exercise voice, if necessary. As a result, actual nonwage spending in education is regressive.

Column (4) reports the baseline regression estimated by maximum likelihood (ML). Since capture is a limited dependent variable (LDV) ($s_{jt} \geq 0$), the least squares estimator is inconsistent.[16] The coefficient on *income* remains highly significant. Figure II plots $dE(s/g)_{it}/d(income_{it})$ for all but the top 20 percentile observations. All derivatives are evaluated at the mean of the explanatory variables. The LDV estimates are quantitatively large, also for schools in poor areas. A 1 percent increase in income increases the amount of public funding reaching the average school by 0.3 percentage points.

With school-specific fixed effects, β_1 is identified by the deviation from school means. This identification strategy may be problematic if all variables have a common time trend. On the other

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16. The maximum likelihood estimator in nonlinear (e.g., LDV) panel models with fixed effects is biased and inconsistent when T, the length of the panel, is small and fixed. As discussed in, e.g., Wooldridge [2002], such a model suffers from an incidental parameter problem. However, the only analytical results in this regard are based on a logit model with $T = 2$ [Hsiao 1996; Abrevaya 1997]. Greene [2003] reports Monte Carlo results for a limited dependent fixed effects model (fixed effects tobit model). He finds that with $T = 5$ (as in our model), the coefficients are unaffected by the incidental parameters problem. The bias is less than 0.5 percent. The standard errors are biased downwards, but the quantitative effect is relatively small (10 percent lower). In Table II, *income* would remain significant at the 1 percent level even if the standard errors were 10 percent larger. Greene [2003] also shows that with the degree of censoring above 50 percent (as in our sample), the marginal effect (as illustrated in Figure II) is downward biased, suggesting that the marginal effects depicted in Figure II are lower bounds on the marginal effects of *income* on local capture.
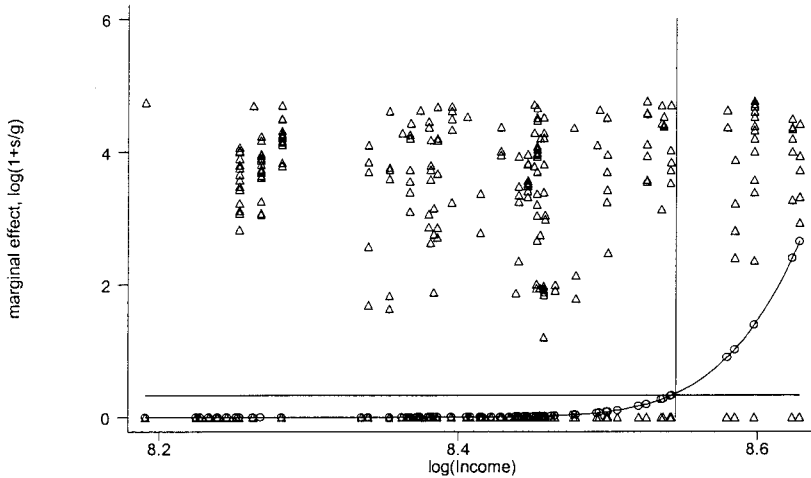
FIGURE II
Marginal Effects of Income on School Funding
Maximum likelihood estimates (Table II, column (4)), excluding the top quintile schools in the income distribution. Δ's are the raw data points; dotted line is the marginal effect (in percent) of income on share of spending reaching the school. Horizontal and vertical lines depict the position of the average school.

hand, including time effects removes most of the variation used to identify β_1. There is no monotonic increase in capture in 1991–1995. However, the degree of capture is significantly higher in the period 1991–1992 than in 1993–1995, but similar within the two time periods. In column (5), we add time effects. The coefficient on *income* becomes smaller, but it is still significant at the 5 percent level.

We run a number of additional robustness tests on the results reported above, including adding further controls (e.g., student-teacher ratio). The results remained intact. We also dropped, one at the time, all observations from each region in Uganda to see whether the results are driven by any region-specific effects. The estimates of β_1 range from 26.6 (when schools in the northern region are dropped) to 45.8 (when schools in the central region are dropped) and are highly significant. Finally, we dropped the school-year observations for which the *share of intended capitation grant received* was above 100 percent (18 observations). This increased the estimate of β_1 by almost 20 percent.

VI. Is Uganda a Special Case?

VI.A. Uganda

Uganda has a tumultuous post-independence history, even compared with many other Sub-Saharan African countries. After the Bagandan monarchy was unconstitutionally abolished in the late 1960s, two decades of violent political conflict followed (see Hansen and Twaddle [1998]). Idi Amin came into power in a coup in 1971, and over the next eight years, more than 300,000 Ugandans lost their lives. In 1972 the Asians—who played an important role in the economy—were given 90 days to leave the country. The economy collapsed to such an extent that in the end, the government was unable to pay the soldiers. Seeking a diversion, Amin went to war with Tanzania. The war was unsuccessful; Tanzanian troops supported by Ugandan rebels reached Kampala, and Amin fled to Libya in 1979. The following year, Obote returned from exile in Tanzania and swept to victory in a rigged election. As in the case of Amin, Obote's tribally based political agenda was harshly enforced. When overthrown in an army coup in 1985, it was estimated that the human rights abuses under Obote claimed at least 100,000 lives. Shortly after Obote became president in 1980, a guerrilla army (the National Resistance Army, NRA), led by Yoweri Museveni was formed. By the time Obote was ousted, the NRA controlled a large part of western Uganda, and in 1986 the NRA launched an all-out offensive and took the capital. Since 1986, Uganda has been undergoing a major economic and political transformation (see Collier and Reinikka [2001]).

Coming on the heels of a civil war, a concern is that Uganda in the early 1990s may be a special case. In this section we discuss the results of three other public expenditure tracking surveys (PETS) in education in Sub-Saharan Africa.

Subsequent to the Uganda study, PETS have also been implemented in Tanzania (for 1998), Ghana (for the fiscal year 1998), and Zambia (for 2001). These three studies replicate the methodology employed in the Uganda PETS, although the objectives were somewhat different.[17] The results of these PETS studies are reported in Table III.

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17. The objective of the studies in Tanzania and Ghana was diagnostic (i.e., to find out whether funds reach the schools for which they are intended). The Zambia study focused on resource flows and learning outcomes. None of these studies collected panel data as the Uganda survey did.

TABLE III

CAPTURE OF NONWAGE FUNDS IN PRIMARY EDUCATION: EVIDENCE FROM PUBLIC
EXPENDITURE TRACKING SURVEYS IN SUB-SAHARAN AFRICA

Country	Year	Expenditure program	Sample size	Capture (percent)
Ghana	1998	Nonwage spending in primary education (multiple programs)	126	49
Tanzania	1998	Nonwage spending in primary education (multiple programs)	45	57
Uganda	1995	Per-student capitation grant	250	78
Zambia	2001	Fixed school grant	182	10
Zambia	2001	Discretionary nonwage grant program	182	76

a. GDP per capita is expressed in constant (1995) US dollars. Sample size is the number of schools surveyed. Capture is the share (in percent) of entitled funds not reaching the schools (average).

b. Source: Ye and Canagarajah [2002] for Ghana; Price Waterhouse Coopers [1999] for Tanzania; Das et al. [2002] for Zambia.

VI.B. Tanzania

The PETS study in Tanzania [Price Waterhouse Coopers 1999] attempted to track all nonsalary flows to primary schools. As the study was diagnostic, the sample was relatively small (45 schools), covering three out of 115 districts. Schools were entitled to funds from three different expenditure programs. As in Uganda, funds from these programs were channeled to schools via district administrations. Funds were disbursed at the discretion of district officials. Although schools typically knew they were entitled to some funding, as resources reaching the schools were predominantly in-kind, without any indication of monetary values, schools/communities seldom knew the value of the (in-kind) support they received or to what exactly they were entitled.

As reported in Table III, the PETS study in Tanzania found that in 1998, on average, 57 percent of all nonwage funds intended for primary schools were diverted and never reached the schools.

VI.C. Ghana

As in Tanzania, the Ghana PETS tracked the flow of all nonsalary expenditures to primary schools (see Ye and Canagarajah [2002]). A total of 126 randomly selected schools were

surveyed in 40 out of 110 districts in Ghana. Unlike the other PETS, the information collected from schools is based on recall data rather than obtained from school records or accounts, which makes the data significantly more noisy and less reliable.

The Ghanian supply system in education is similar to that in Tanzania. Funds to schools are channeled through district offices. Most of the resources reaching the schools were in-kind, and schools had little knowledge of the monetary value of what they actually received.

The Ghana PETS study found that, on average, 49 percent of the nonwage funds were captured.

VI.D. Zambia

There are two grant programs in primary education in Zambia: a rule-based grant program where each school is entitled to a fixed grant, and a program which disburses at the discretion of district offices. The Zambia PETS tracked both these programs [Das et al. 2002]. A total of 182 schools out of four provinces were surveyed.

Das et al. [2002] find that the rule-based grants reached the schools to a large extent. However, only about one-fourth of the discretionary funds reached the schools.[18]

VI.E. Discussion

In four out of the five educational programs discussed above, local capture is a serious problem.[19] Why is this? As noted above, poorly informed users are likely to be an important factor. Asymmetric information facilitates the discretionary use of public funds by local officials and politicians. The system of patronage politics and the lack of other sources to fund the local political apparatus—features shared by most Sub-Saharan African countries—explain why this information gap is exploited.[20]

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18. The weighted average of funds not reaching the schools in Zambia is 60 percent.

19. The rule-based program in Zambia is an exception. As discussed in Das et al. [2002], this program was well understood by Zambian school officials. One explanation is that by the time the Zambian PETS was implemented, the Ugandan experience of capture in the education sector was widely known in Anglophone Africa.

20. See Bayart [1993] and Tordoff [1992].

However, despite similar institutions, there is still some cross-country variation in local capture. Specifically, local capture in Tanzania, a neighboring country with lower per capita income, is somewhat lower than in Uganda. There are several possible explanations for this. First, the fact that the beneficiaries were at least aware of a support system in Tanzania, although they had little detailed information about how it worked, is one possible cause. History may be another explanation. As a result of two decades of civil conflict, public schools in Uganda were to a large extent run by the communities which, in turn, had chosen to limit their contacts with public authorities. As a result, not only had schools/communities scarce knowledge about the grant program, but the cost of investing time and resources to learn about their entitlements and protest were likely to be higher than for their counterparts in Tanzania.[21] Yet another explanation is related to differences in investment in social capital. Both Uganda and Tanzania are ethnically diverse countries, but while Tanzania has consistently pursued a policy of nation-building, Uganda has, at best, mimicked the policies of neighboring Kenya.[22] The politics of ethnic diversion was a cornerstone of the regimes of Milton Obote and Idi Amin, just as it was for the first two post-independent presidents of Kenya, Jomo Kenyatta and Daniel arap Moi. Investment in social capital through nation-building policies can be an important explanation for the observed difference in local capture, as it determines communities' ability to produce local public goods, raise funds, and cooperate on policies to improve the community's welfare.[23]

VII. CONCLUDING REMARKS

In this paper we have, to our knowledge, provided the first quantitative assessment of local capture in a large public expenditure program in a developing country.

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21. As an example, in an interview reported in Thomas [1998, p. 25], the interviewee noted that "under Amin, you would be shot for raising issues of corruption."
22. See Miguel [2003] and references given therein.
23. The findings in Miguel [2003] illustrate that this effect may be quantitatively important. Comparing outcomes in two nearby districts, one in Kenya and one in Tanzania, he finds that at the mean level of diversity, on average, Kenyan communities have 25 percent less school funding than homogeneous communities. The comparable figure in the Tanzanian district is close to zero.

We have also argued that resource flows are endogenous to schools' sociopolitical endowment. Rather than being passive recipients of flows from the government, schools use their bargaining power vis-à-vis other parts of the government to secure larger shares of funding. Resources are therefore not allocated according to the rules underlying government budget decisions, with substantial equity implications. Specifically, we find that poor students suffered disproportionately due to local capture because schools catering to them received even less than others. This is in contrast to benefit incidence studies using budget data and finding public spending to be distributionally neutral [World Bank 1996]. We have also shown that local capture is not a specific problem for Uganda. In fact, local capture in educational programs appears to be a serious problem in all other African countries where similar public expenditure tracking studies have been implemented. A common denominator in these education programs is that, at best, users have limited knowledge about the public funding to which they are entitled.

The contribution of this paper is not only empirical. A methodological contribution is the design of a new survey tool—the public expenditure tracking survey—that can be used to gather data on government resource flow and service delivery, including quantifying capture. Similar surveys are presently being implemented in several other developing countries. In countries with poor accounting systems, such a survey can provide policy-makers with valuable information both on the financing and the performance of the service delivery system. It also provides a new type of data for empirical research.

In addition, information disseminated directly to the public can play a critical role in improving spending outcomes. The Uganda case is a good example. The findings of the public expenditure tracking survey prompted a strong response from the central government. It began to publish monthly transfers of public funds to districts in newspapers. It also required primary schools to post public notices on all inflows of funds. This promoted accountability by giving schools and parents access to information needed to understand and monitor the workings of the grant program. Preliminary evidence from an evaluation of the information campaign suggests markedly improved outcomes [Reinikka and Svensson 2003].

APPENDIX 1: SCHOOL INCOME, 1991–1995

Panel A	1991	1992	1993	1994	1995
Government	6,804	4,980	5,723	8,571	9,427
Teacher salaries	2,696	2,446	3,596	6,305	7,168
Capitation grants	3,177	1,822	1,433	1,267	1,107
Rehabilitation	930	712	694	1,000	1,153
Parents (PTA)	9,734	9,576	10,258	11,553	12,930
PTA levies	7,450	6,945	7,310	7,874	8,093
Teacher salaries	1,586	1,528	1,848	2,533	3,730
Tuition fees	698	1,103	1,099	1,147	1,107
Total per student	16,537	14,556	15,980	20,125	22,357
Panel B					
Government	100	100	100	100	100
Teacher salaries	40	49	63	74	76
Capitation grants	47	37	25	15	12
Rehabilitation	13	14	12	11	12
Parents (PTA)	100	100	100	100	100
PTA levies	77	73	71	68	63
Teacher salaries	16	16	18	22	29
Tuition fees	7	11	11	10	8
Total	100	100	100	100	100
Government	41	34	36	43	42
Parents (PTA)	59	66	64	57	58

a. Per student income in 1991 USh in Panel A and percent in Panel B.

b. Capitation grants based on what schools should have received; other items are actual receipts by the schools, based on survey data.

APPENDIX 2: SAMPLE DESIGN

Two general criteria governed the selection of the sample of schools to be surveyed from the set of eligible (i.e., government) schools (see Reinikka [2001] for details). First, the sample should have a broad regional coverage. Second, it should be representative of the population of schools in the selected districts. To account for these considerations, a stratified random sample was chosen. Specifically, for each region, two (or three) districts were drawn with a probability proportional to the number of schools in the district, yielding a sample of 18 districts (out of 39) as illustrated in Appendix 6. In the selected districts, the number of schools visited ranged from 10 to 20, depending on the total number of schools in the districts. Enumerators were trained and closely supervised by a local research team and survey experts from the World Bank to ensure the quality and uniformity of data collection and standards for assessing record-keeping at the schools. In addition to collecting detailed in-

formation on financial and in-kind receipts and enrollment data, interviews with headmasters and representatives of PTAs provided qualitative information to supplement the quantitative data.

APPENDIX 3: DATA DESCRIPTION

Variable name	*Definition*
Income	Mean consumption level at the district-urban-rural location per adult equivalent per month in 1989 USh. Constructed using the 1992–1995 Uganda Household Surveys data. The 1992 Integrated Household Survey data (IHS 1992) provided the basis for the variable. First, the IHS 1992 was used to derive the mean consumption levels per adult equivalent in 1992 at the district-urban-rural location. Second, subsequent household surveys were used to derive annual district real growth rates over the period, broken down by urban and rural. Third, the average real annual growth rate over the period was used to infer the urban-rural-district mean consumption levels in 1991. Income was then derived by combining the growth data for 1991–1995 with the district mean consumption levels in 1992 for urban and rural.
Missing records	Dummy variable taking the value of 1 for schools with missing records for at least one year during the survey period, 0 otherwise.
School size	Number of students in P1–P7.
Share of intended capitation grant received	Capitation grant received as a share of what should have been received. The amount that should have been provided is based on the number of students in 1991 (or the first year it was recorded).
School quality	Share of qualified teachers to total number of teachers.
Students-teacher ratio	The number of students per teacher.

APPENDIX 4: DATA QUALITY

Specification	(1)	(2)	(3)	(4) I
Income	−0.002			0.021
(average)	(.058)			(.062)
	[.978]			[.731]
Share of qualified teachers		−0.044		−0.021
(average)		(.038)		(.043)
		[.241]		[.624]
School size			−0.074	−0.065
(average)			(.040)	(.047)
			[.067]	[.173]
No. schools	245	245	245	245
Adj. R^2	0.00	0.01	0.01	0.01

a. The dependent variable is "missing records"; all explanatory variables are in logarithms.
b. Least-squares estimates with robust standard errors are in parentheses, and *p*-values are in brackets.

APPENDIX 5: DESCRIPTIVE STATISTICS

Variable	Mean	Med.	St. dev.	Max.	Min.	Obs.
Students	486	422	341	3,628	35	1068
Student-teacher ratio	32.1	31.3	12.2	110	6	1063
Percent qualified teachers	68.5	77.8	30.2	100	0	1064
Income	5,803	4,697	4,116	24,893	3,607	1250

APPENDIX 6: DISTRICTS INCLUDED IN THE PETS 1996

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REFERENCES

Abrevaya, Jason, "The Equivalence of Two Estimators of the Fixed Effects Logit Model," *Economics Letters,* LV (1997), 41–44.

Alesina, Alberto, "The Political Economy of High and Low Growth," Paper presented at the 1997 Annual Bank Conference on Development Economics, World Bank, Washington, DC, 1999.

Azfar, Omar, Satu Kähkönen, Jeffrey Livingston, Patrick Meagher, and Diana Rutherford, "Making Decentralization Work: An Empirical Investigation of Governance and Public Services in Uganda," Working Paper, Center for the Institutional Reform and the Informal Sector (IRIS), University of Maryland, 2000.

Barro, Robert, "Economic Growth in a Cross Section of Countries," *Quarterly Journal of Economics,* CVI (1991), 407–443.

Bayart, Jean-Francois, *The State in Africa: The Politics of the Belly* (London, New York: Longman, 1993).

Boone, Peter, "Politics and the Effectiveness of Foreign Aid," *European Economic Review,* XC (1996), 289–329.

Brennan, Geoffrey, "The Distributional Implications of Public Goods," *Econometrica,* XLIV (1976), 391–399.

Burnside, Craig, and David Dollar, "Aid, Policies and Growth," *American Economic Review,* XC (2000), 847–868.

Collier, Paul, and Ritva Reinikka, "Reconstruction and Liberalization: An Overview," *Uganda's Recovery: The Role of Farms, Firms, and Government,* R. Reinikka and P. Collier, eds. (Regional and Sectoral Studies, Washington, DC: The World Bank, 2001).

Das, Jishnu, Stefan Dercon, James Habyarimana, and Pramila Krishnan, "Rules vs. Discretion: Public and Private Funding in Zambian Basic Education. Part I: Funding Equity," Working Paper, The World Bank, 2002.

Dehn, Jan, Ritva Reinikka, and Jakob Svensson, "Survey Tools for Assessing Performance in Service Delivery," *The Impact of Economic Policies on Poverty and Income Distribution: Evaluation Techniques and Tools,* L. A. Pereira da Silva and F. Bourguignon, eds. (A copublication of the World Bank and Oxford University Press, 2003).

Demery, Lionel, "Analyzing the Incidence of Public Spending," *The Impact of Economic Policies on Poverty and Income Distribution: Evaluation Techniques and Tools,* L. A. Pereira da Silva and F. Bourguignon, eds. (A copublication of the World Bank and Oxford University Press, 2003).

Filmer, Deon, and Lant H. Pritchett, "The Impact of Public Spending on Health: Does Money Matter?" *Social Science and Medicine,* XLIX (1999), 1309–1323.

Greene, William, "Fixed Effects and Bias due to the Incidental Parameters Problem in the Tobit Model," Working Paper, New York University, 2003.

Gugerty, Mary Kay, and Edward Miguel, "Community Participation and Social Sanctions in Kenyan Schools," Working Paper, Department of Economics, University of California at Berkeley, 2000.

Hansen, Henrik, and Finn Tarp, "Aid and Growth Regressions," *Journal of Development Economics,* LXIV (2001), 547–570.

Hansen, Holger Bernt, and Michael Twaddle, eds., *Developing Uganda* (Oxford, UK: James Currey; Athes, OH: Ohio University Press, 1998).

Hausman, Jerry A., "Specification Tests in Econometrics," *Econometrica,* XLVI (1978), 1251–1271.

Hirschman, Albert O., *Exit, Voice, and Loyalty: Response to Decline in Firms, Organizations, and States* (Cambridge, MA: Harvard University Press, 1970).

Hsiao, Cheng, "Logit and Probit Models," *The Econometrics of Panel Data: A Handbook of Theory and Applications,* L. Mátyás and P. Sevestre, eds. (Dordrecht, The Netherlands; Norwell, MA: Kluwer Academic Publishing, 1996).

Jeppson, Andreas, "Financial Priorities under Decentralization in Uganda," *Health Policy and Planning,* XVI (2001), 187–192.

Kormendi, Roger C., and Philip G. Meguire, "Macroeconomic Determinants of Growth: Cross-Country Evidence," *Journal of Monetary Economics,* XVI (1985), 121–163.

Landau, Daniel, "Government and Economic Growth in Less Developed Coun-

tries: An Empirical Study," *Economic Development and Cultural Change,* XXXV (1986), 35–75.

Levine, Ross, and David Renelt, "A Sensitivity Analysis of Cross-Country Growth Regressions," *American Economic Review,* LXXXII (1992), 942–963.

McPake, Barbara, Delius Asiimwe, Francis Mwesigye, Mathias Ofumbi, Lisbeth Ortenblad, Pieter Streefland, and Asaph Turinde, "The Economic Behavior of Health Workers in Uganda: Implications for Quality and Accessibility of Public Health Services," *Social Science and Medicine,* XLIX (1999), 849–865.

Merman, Jacob, *Public Expenditure in Malaysia: Who Benefits from Government Expenditure?* (New York: Oxford University Press, 1979).

Miguel, Edward, "Ethnic Diversity and School Funding in Kenya," Working Paper, University of California at Berkeley, 2000.

——, "Tribe or Nation? Nation-Building and Public Goods in Kenya versus Tanzania," Working Paper, University of California at Berkeley, 2003.

Narayan, Deepa, and Lant Pritchett, "Cents and Sociability: Household Income and Social Capital in Rural Tanzania," *Economic Development and Cultural Change,* XLVII (1999), 871–897.

Price Waterhouse Coopers, "Health and Education Financial Tracking Study," Report prepared for Government of Tanzania, 1999.

Ram, Rati, "Government Size and Economic Growth: A New Framework and Some Evidence from Cross-Section and Time-Series Data," *American Economic Review,* LXXVI (1986), 191–203.

Reinikka, Ritva, "Recovery in Service Delivery: Evidence from Schools and Health Centers," *Uganda's Recovery: The Role of Farms, Firms, and Government,* R. Reinikka and P. Collier, eds. (Regional and Sectoral Studies, Washington, DC: The World Bank, 2001).

Reinikka, Ritva, and Jakob Svensson, "The Power of Information: Evidence from a Newspaper Campaign to Reduce Capture," Working Paper, Institute for International Economic Studies, Stockholm University, 2003.

Republic of Uganda, "Monthly Report of the Uganda Computer Centre," Kampala, various years.

Selowsky, Marcelo, *Who Benefits from Government Expenditure: A Case Study of Colombia* (New York: Published for the World Bank by Oxford University Press, 1979).

Stasavage, David, "On the Role of Democracy in Uganda's Move to Universal Primary Education," Background paper for the 2004 World Development Report (A copublication of the World Bank and Oxford University Press, 2003).

Svensson, Jakob, "Who Must Pay Bribes and How Much? Evidence from a Cross Section of Firms," *Quarterly Journal of Economics,* CXVIII (2003), 207–230.

Thomas, Melissa, "Corruption and Political Finance in Africa," PREM Seminar Series, The World Bank, Washington, DC, 1998.

——, "The Incentive Structure of Systemic Corruption," Working Paper, The World Bank, Washington, DC, 1999.

Tordoff, William, *Government and Politics in Africa* (London: Macmillan, 1992).

Wade, Robert, *Village Republics* (Cambridge, UK: Cambridge University Press, 1988).

Wooldridge, Jeffrey M., *Econometric Analysis of Cross Section and Panel Data* (Cambridge, MA: MIT Press, 2002).

World Bank, "Access to Education and Health Care in Uganda," Report prepared by Country Operations Division, Eastern Africa Department and Poverty and Social Policy Department, Washington, DC, 1996.

Ye, Xiao, and Sudharshan Canagarajah, "Efficiency of Public Expenditure Distribution and Beyond: A Report on Ghana's 2000 Public Expenditure Tracking Survey in the Sectors of Primary Health and Education," Africa Region Working Paper No. 31, The World Bank, Washington, DC, 2002.