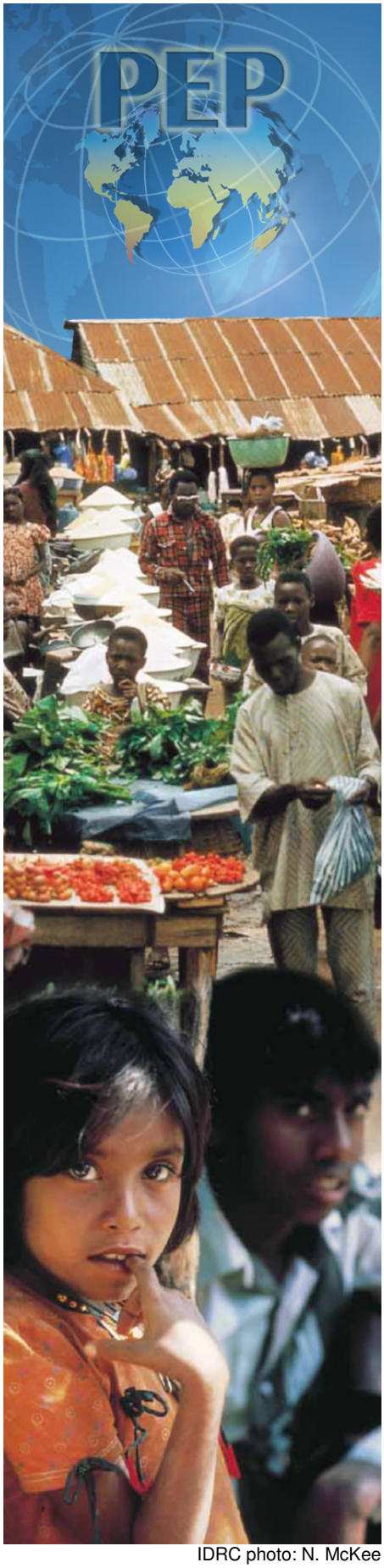


IDRC photo: N. McKee

POVERTY & ECONOMIC POLICY
RESEARCH NETWORK

PMMA Working Paper 2008-12

Will Formula-Based Funding and Decentralized Management Improve School Level Resources in Sri Lanka?

Nisha Arunatilake
Priyanka Jayawardena

August 2008

Nisha Arunatilake (Institute of Policy Studies of Sri Lanka)
nisha@ips.lk
Priyanka Jayawardena (Institute of Policy Studies of Sri Lanka)
priyanka@ips.lk

Abstract

Using the experience of the Educational Quality Inputs (EQI) Scheme in Sri Lanka, the paper examines the distributional aspects of formula-based funding and efficiency of decentralized management of education funds in a developing country setting. The study finds that the EQI fund distribution is largely pro-poor, with the exception of expenditure at the collegiate level. The study finds that allocating more funds to more disadvantaged schools alone is insufficient to reduce disparities as the inability of schools to fully utilize the funds holds back progress. The study findings support the hypothesis that qualified principals, adequate levels of human and physical resources, and state-level monitoring and support is needed for the success of education management at the school level. The study highlights the need to better use information collected from the schools on the EQI scheme to simplify and improve its implementation and effectiveness.

Keywords: Education Finance, Sri Lanka, formula-based funding, decentralized management of schools

JEL codes: I20, I21, I22, I28, I38

This work was carried out with financial and scientific support from the Poverty and Economic Policy (PEP) Research Network, which is financed by the Australian Agency for International Development (AusAID) and the Government of Canada through the International Development Research Centre (IDRC) and the Canadian International Development Agency (CIDA). The authors would like to thank the Poverty and Economic Policy (PEP) Research Network for funding and technical advice. The authors acknowledge competent research assistance by Roshani De Silva. The authors are grateful to the following for useful comments and suggestions: Anton De Grauwe and Kenneth Ross of the International Institute for Education Planning (IIEP), Steve Younger, Gustavo Yamada, and other participants at the 6th Annual PEP Conference in Lima, Peru.

1. Introduction

Formula-based funding and decentralized management of schools as a means of improving school quality and performance have received renewed interest in the late 1990s, especially among developed countries. International experience suggests that needs-based resources allocation through formula funding has great potential for improving resource allocation to schools. However, the success of such funding schemes in improving educational outcomes will depend on the appropriateness of the formula for funding the development needs of schools and other considerations such as the availability of accurate information on schools, availability of procedures for ensuring transparency and accountability, and the availability of monitoring, evaluation and corrective procedures for assessing the efficiency of the use of funds (Ross and Levacic, 1999). The outcomes of formula funding of education will also depend on how well these funds are managed. On the other hand, international experience in decentralized management of resources is inconclusive. Decentralized management of schools has been advocated mainly in the hope of improving management efficiency and learning outcomes. However, experience shows that especially in developing countries, school-based management can lead to unwanted outcomes such as poor quality, greater inequity, and corruption in the presence of lack of basic resources, poor school-support systems, lack of performance evaluations, and lack of incentives to improve learning outcomes (Grauwe, 2005).

The school system in Sri Lanka has been challenged by increasing disparities across schools and problems of low achievement rates. Enrolment and achievement rates, especially for post primary grades, are worse for children from poorer households and less developed provinces. At the same time, high unemployment rates among the more educated youth points to the problems with relevance to education (World Bank, 2005; ADB, 2005). The practice of allocating resources to schools based on a combination of historical precedent, negotiations, and discretion were identified as a reason for disparities in learning outcomes across the country. As a solution to this problem, the Educational Quality Inputs (EQI) Scheme was proposed and implemented beginning 2000. Under this scheme the control of 2 per cent of total recurrent and 20 per cent of total capital funds allocated for primary and secondary education are given to schools. The funds are allocated through a norm-based-resource allocation formula and are managed by schools. According to school census data in 2004 schools received Rs. 579 million (USD 5.72 million) on the EQI programme. However, Rs. 121.8 million (USD 1.2 million) of this funding was left unspent. On average, schools were able to spend 81 per cent of the funds made available to them.

Availability of good quality comprehensive data on the EQI scheme and on other

factors affecting management outcomes of education provides a unique opportunity to examine the experience of formula-based funding and decentralized management of education in a developing country setting. In this regard, this paper will address the following specific questions:

1) How is allocation of funds and its management different under EQI compared to the earlier funding processes? Is the present system an improvement over the earlier one?

2) Does the EQI fund allocation mechanism achieve the objectives of improving equity in resource allocation from the individual perspective?

3) Why are large amounts of EQI funds left unspent? How does management capacity affect the utilization rate of EQI funds?

The results of the study are summarized in section 6.[1] Section 2 provides the backdrop to the study by describing the education system in Sri Lanka. Section 3 describes the functioning of the EQI scheme. Section 4 examines the distribution of EQI expenditure across schools and section 5 examines the distribution across households. Section 6 examines the management of EQI funds by schools using EQI utilization rate as a proxy for measuring management. Section 7 summarizes the results of the study and section 8 provides recommendations for improving the EQI scheme and identifies future research needs, based on the findings of the study. Finally, section 9 notes the study's limitations.

1.1 Theoretical underpinnings of the research questions

1.1.1 Allocative effectiveness of the EQI funds among schools

The first research question deals with different mechanisms for allocating funds and how these affect the distribution of funds across schools. Formula-based education funding received renewed interest in the 1990s with the implementation of widespread decentralization approaches to education administration in a number of developed countries including Australia, Canada, New Zealand, United Kingdom and the USA. As a result, new concepts and methodologies for allocating funds according to educational needs of schools were developed (Ross and Levacic, 1999).

Ross and Levacic (1999) summarize the differences in formula-based funding in the pre- and post- 1990s into three key aspects as follows. First, unlike in the earlier period, all

[1] Literature that study the effect of decentralized decision-making usually examine the effect of decentralization on learning outcomes. However, as only a small portion of the budget is decentralized, its influence on learning outcomes at the aggregate level is likely to be minimal. As such, this paper will not attempt to examine the effect of decentralization on learning outcomes.

schools in a system were taken into account when distributing funds. The amounts of funds that were distributed were a large share of the total education budget of the system and attempts were made to design formulae that genuinely took into account the needs of different schools, including student characteristics, school programmes and school site differences – such as rural remote as opposed to urban.

Second, in the post 1990s period, attempts were made to design funding formulae based on school needs and grounded on research findings. This approach attempts to remove three undesirable aspects of budgeting practiced in the earlier period, namely: historical budgeting, bargaining, and personal preferences of school administrators. In historical budgeting, budgets were decided based on adjustments made to previous year's budgets. This has often resulted in widening disparities between schools, as under-resourced schools continued to get lower budgets compared to better resourced schools. In bargaining, more enterprising school principals bid and bargain for higher amounts of funds for their schools. This results in these schools getting more funds as opposed to others. Budgets based on personal preferences of the school administrators also resulted in unfair distributions of resources as personal biases and favoritism affected the administrators' decisions.

Third, the outcomes resulting from formula-based funding were to be justified at different levels of the school system. This requires that formula-based fund allocations need to be transparent and easily understood such that all stakeholders in the education process can assess and influence changes to improve the fairness and effectiveness of the formula-based funding process.

In section four we will describe fund allocation under the EQI scheme and discuss how this is different from the earlier systems of distributing funds in Sri Lanka. Using descriptive analysis of data we examine whether the fund allocations meet the intended objectives.

1.1.2 Allocative efficiency of the EQI funds across households

The first question deals with the improvements in allocating funds among schools. Unlike in developed countries however, the school participation rate in developing countries is low such that, even when funds are allocated fairly across schools at the individual level, funds may not be fairly distributed. This is because the benefits of publicly financed education may be enjoyed by the more affluent children who go to school. This leads to the third research question: does the EQI fund allocation mechanism achieve the objectives of improving equity in resource allocation from the individual perspective? The funds received at the individual level are affected by two parameters. First, in order for a child to benefit from the EQI funds, the child has to attend school. Second, the share of EQI funds received by a child also depends on the formula and how it is adopted by the education system.

When deciding on a funding formula the main issues to consider include the amount to be allocated to each school and the factors to be considered in allocating these amounts. The success of formula- based funding critically depends on three key factors. First, the formula needs to be well-designed and should cater to intended outcomes. Second, yet equally important, information needed to allocate fund according to the specific formula needs to be easily available. Lastly, the available information should be reliable (Ross and Levacic, 1999).

In section five we assess how the EQI funds are distributed among the population. The intention in this section is not to examine the appropriateness of the formula or the reliability of the information available for implementing the formula, but to examine the equity in outcomes of these efforts to distribute the EQI funds.

1.1.3 School-based management of EQI

Lastly, we turn to the management aspects of the EQI funds. The economic rationale for decentralizing education is that bringing decision-making closer to the people improves social welfare and technical efficiency. Decentralization has the potential to improve technical efficiency in several ways: (1) Localized decision-making reduces problems of information asymmetries and improves relevance; (2) it is more democratic, (3) it reduces administrative costs associated with centralized decision-making; (4) it alleviates problems associated with collective decision-making; and (5) it improves transparency and greater mobilization of funds at the local level (Burki, Perry, and Dillinger, 1999; Galiani, Gertler, and Schargrodsky, 2005; Behrman, Deolalikar, and Soon, 2002; Grauwe, 2005; Caldwell, 1998.

However, the literature does not provide conclusive evidence that decentralized-decision making results in improving pedagogical outcomes (Grauwe, 2005). First, positive effects of decentralization are reduced in the presence of weak technical and managerial capacity at the local level and weak ability of local communities to voice preferences (Gunnarsson *et al.,* 2004, Galiani Gertler, and Schargrodsky, (2005), Galiani and Schargrodsky (2002))

A second important aspect that influences the success of decentralized education management is the level of authority given to local level decision-makers by the center and those that allow greater participation of the community in the decision-making process. (Gunnarsson *et al.,* 2004; Gropello, 2004; Sawada, 2000). In addition, the capacity of the communities to exercise pressure on schools also plays a key role in the effective management of schools under decentralization (Grauwe, 2005).

Third, inadequate attention given to reorienting the functions of the central government to the role of guidance and support from that of decision making on resource

allocation has also reduced the efficiency outcomes of decentralized decision-making (Hirosato, 2001; Caldwell, 1998; Grauwe, 2005).

Lastly, the quality of the leadership provided by the head-teacher plays a key role in improving educational outcomes under decentralized management of schools. (Grauwe, 2005).

In section six we examine whether the above raised concerns regarding decentralized management in a developing country setting are relevant for the case of the EQI scheme in Sri Lanka.

2. Structure and Management of Education in Sri Lanka

Education in the country is provided through an extensive network of schools, which numbered 10,461 in 2005. Close to 93 percent of these schools are public schools. Since the Free Education Act of 1949, the government, at its various levels, has been the principal source of funding for the provision of education in Sri Lanka. Tuition is provided free of charge in all public schools. In addition, the government provides free textbooks, uniforms, and other benefits to school children. Education is compulsory up to grade 9 in the country.

The present management structure of education in the country has prevailed since the enactment of the 13th Amendment to the Constitution in 1987, which established the provincial council system. In this system, most schools come under the purview of the provincial authorities.[2] The main factor driving the devolution of powers to the provinces were political more than efficiency considerations. Functions of provincial level education management are limited to development of education plans and budgets, deployment of teachers and principals, and some forms of teacher training.

2.1 Quality and Access to Education

Sri Lanka has achieved commendable results in school enrolment rates due to the education policies pursued by successive governments that ensured the accessibility of education both geographically and financially. Its Grade 1 net enrolment of about 97 per cent that is comparable between males and females is better than those in comparable South Asian and Developing countries. Despite these encouraging national level statistics at the primary level, there are variations in the enrolment rates across geographic and socio-economic sections of the population at higher levels of schooling. For example, net junior secondary enrolment (grades 6-9) varies from 61 percent for the poorest income quintile to 76 percent for the highest income quintile. At province level, it varies from 73 percent for the

[2] A handful of schools (324 in 2005) denoted as “national schools” are directly managed by the Ministry of Education (MOE).

conflict affected Northern/Eastern provinces to 87 per cent for the most developed Western province (World Bank, 2005).

The main challenge for the education sector in the recent past has been in improving the quality and relevance of education. Low achievement rates are indicative of poor quality education. A recent study shows that at the end of grade four, only 37 per cent of children have achieved mastery of a first language and only 38 per cent have achieved mastery in mathematics (NEREC, 2004). Although most children complete primary level, 18 per cent of children do not complete lower secondary level. At the higher secondary level only 42 per cent of children who sit for it pass the Ordinary Level national exam, while only 40 per cent of children pass the Advanced Level national exam at the collegiate level (World Bank, 2005; ADB, 2005). The low school participation at higher levels and low achievement results stem from a variety of factors relating to, on one hand, supply side issues such as education finance, limitations in human and physical capital development, teacher deployment, teacher training, resource availability, administrative and management shortcomings, and problems with monitoring and evaluation. On the other hand, demand side problems such as poverty, direct and indirect costs of schooling, and cultural factors also keep children away from school (Arunatilake, 2006).

2.2 Education Financing and Distribution of Resources

Compared to developing country standards, the expenditures on education in Sri Lanka are low. At present, Sri Lanka spends about 33,000 million rupees (343 million US dollars) on primary and secondary education. In recent years, government expenditure on education (including tertiary education) has amounted to 2-3 percent of Gross Domestic Product, or 7-9 percent of total government expenditure.[3]

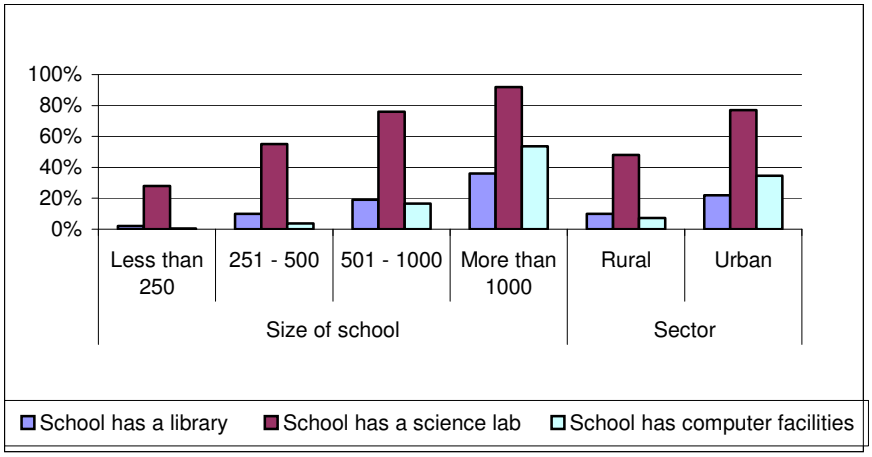
Low investments in education have especially affected development in the education sector, both in terms of expenditure on capital goods and investments in human and physical capital development. The capital budget on education was reduced from 5 per cent of government expenditure in 1999 to 2.5 per cent of government expenditure in 2002. This reduction has resulted in limiting essential investments in improving facilities at schools – such as classrooms, laboratories, libraries - and improving supply of basic facilities – such as furniture. The recurrent budget accounts for around 80 percent of the public expenditure budget on education, and almost 90 percent of this is spent on salaries and wages. A further 5 percent is spent is on welfare items such as textbooks and school uniforms. A major portion of the remaining amount is spent on utilities such as water, electricity and telecommunication, leaving almost no funds for teacher training, improving administrative

[3] In 2002, 80 percent of government expenditure was on primary and secondary level education.

and management capacity, and maintenance of capital goods. (NEC, 2003; World Bank, 2005).

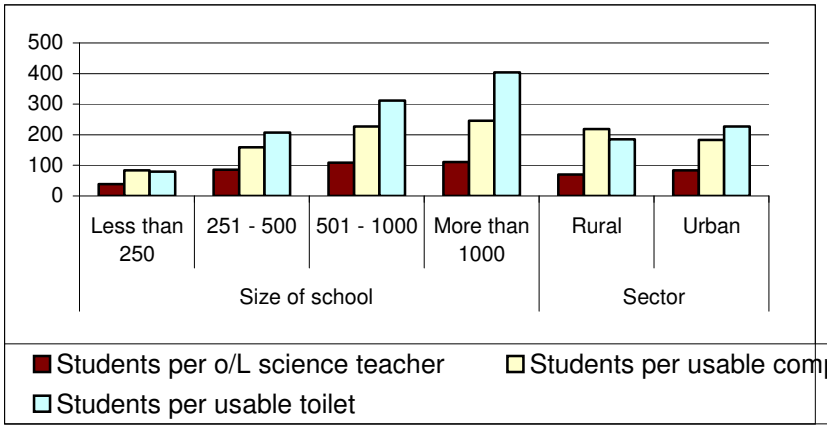
Recurrent expenditure on primary and secondary education is distributed fairly across provinces (WB, 2005). Since the introduction of a norm-based unit cost resource allocation mechanism in 2000, the discrepancies in funding between schools with similar characteristics have been reduced considerably over the years (World Bank, 2005). However, historical discrepancies and lack of maintenance and management of capital assets have resulted in the persistence of wide variations in resource availability at schools. Smaller schools and rural schools are less likely to have libraries, science labs, and special subject rooms (see Figure 1.a). Although they have less students per teacher, they are also more likely to have teacher shortages, particularly special subject teachers. Further, anecdotal evidence suggests that the smaller student-teacher ratios in rural schools are due to overcrowding of urban schools by students seeking good quality education (see Figure 1.b, although larger schools and urban schools are more congested). The majority of small schools are situated in rural areas.

Figure 1.a. Availability of resources, by size and location of school



Source: Own calculations, using School Census 2004 data.

Figure 1.b. Students per available resource, by size and location of school



Source: Own calculations, using School Census data.

2.3 Education Sector Reforms and Decentralized Decision Making

The "New Educational Reforms" proposed in 1997 and implemented since 1998 planned several amendments to the education policy in the country to improve access to better quality education for all, and to improve relevance of education, teacher training, and management of education and resource provision (Wijesundera, 1998; NEC, 2003). These reforms are currently being implemented through various donor-funded projects. The World Bank funded Second General Education Project (GEP) for example, strives to decentralize education decision-making to the school level, as a means of improving quality and access, and making management of educational resources more efficient. The initial attempt at decentralizing decision-making regarding schools started with the Education Quality Inputs scheme (EQI).

3. The Functioning of the Education Quality Inputs Scheme in Sri Lanka[4]

3.1 How is the EQI Scheme implemented?

This section details how the EQI scheme is implemented in Sri Lanka. Education quality inputs are defined to be "all materials, equipment, instruments and services used to add the quality of education to the students in the learning process and by the teachers in the process of imparting knowledge" (FC, 2002). The different types of educational quality inputs being funded under this scheme include:

a) Consumable goods – such as chalk, chemicals, stationery, gas, daily news papers, etc.;

b) Capital quality inputs such as – computers, printers, musical instruments, etc.;

c) Funds for repair and maintenance of capital goods; and

d) Funds for external consultancy services (e.g., guest lectures for students).

Under the EQI scheme, schools were given primary responsibility for purchasing EQI, except for a few special items. Every school has a separate current account for EQI, where funds for purchasing EQI are credited at the beginning of each year.

EQI funds are managed by two school committees, the School Purchasing Committee (SPC) and the School Evaluation Committee (SEC) consisting of the principal, deputy principal and senior teachers and student leaders of the school. Small schools have to only appoint a SPC. In these schools, the functions of an SEC are carried out by the divisional educational offices. The identification and prioritization of EQI is done by the SEC

[4] Most of the information in this section is from FC (2002).

in consultation with relevant subject teachers. The SPC approves the purchase of EQI identified by the SEC. This process has to be completed during the first month of the school year.

Identification of suppliers for educational resources is done according to guidelines given by the central Ministry of Education. These detail how to call for quotations and choose suppliers to get best value for money, what percent of the goods to be bought at any one time (depending on the availability of storage capacity), and how to adhere to quality input norms prepared by the National Institute of Education. Schools are required to document all proceedings regarding the EQI procurement process and to keep accounts on the EQI expenditures.[5]

Anecdotal evidence suggests that although the EQI scheme resulted in improving the availability of educational inputs to a certain level, the intended equitable and efficiency outcomes were limited. The effective use of EQI funds depends on the ability and effort of the teachers to identify EQI that will improve the teaching and learning process, yet teacher training relating to the use of EQI has been insufficient (Karunaratne, 2002) and existing teacher shortage problems in rural areas compound this situation. In addition, various procedural and procurement-related problems, delays in fund distribution, and poor leadership in the use of EQI has led to poor utilization of EQI funds. [6]

3.2 Level of Education Decentralization in Sri Lanka under the EQI

There is growing literature on experiences in education decentralization around the world. This shows that education decentralization differs from country to country. There are three main axes along which decentralization takes form. The first axis relates to the degree of devolution of education decision-making, ranging from central government across different levels of governments down to the school level. The second relates to the different functions of education decision-making that have been decentralized, including curricular and pedagogical development, human resource management, training, planning, and resource allocation. The third relates to the level of financial autonomy. The same school systems may have different levels of financial autonomy for different functions of education decision-making. (Burki, Perry and Dillinger; 1999, Eskeland and Filmer, 2002).

In this topology, the degree of education decentralization in Sri Lanka under the EQI

[5] There are 11 different types of books and records relating to the procurement and identification of EQI for the schools.

[6] School principals with a poor grasp of how to use EQI funds do not utilize EQI funding fearing that they will not abide by proper procedure. In this respect, older school principals nearing retirement were especially mentioned, as they feared their pensions would be affected by improper management of funds.

scheme goes down to the school level along the function of decision-making on resource allocation on education quality inputs.[7] However, the decision-making at the school level takes place under guidance from the center while monitoring is by the local level educational authorities. As such the schools do not have complete autonomy over resource allocation under EQI. The scheme is fully financed by the center.

4. Allocation and management of EQI funds

In this section we concentrate on the first research question. We first describe the two systems of budgeting adopted in Sri Lanka: a) budgeting for non-EQ inputs and b) budgeting for EQI inputs. Next, we will examine distribution of EQI funds to assess whether these funds are distributed according to the established best practices.

4.1 Allocation of non- EQI education funds

Funds allocation for non-EQI takes place in a lengthy manner: estimates are arrived at from a bottom-up process, but fund allocations take place through a top-down process. In theory, the divisional education authorities, in consultation with the school authorities and principals, assess the needs of the schools. They then prepare budget estimates in accordance with guidelines provided by the Finance Commission[8] and the Treasury. These budget proposals are subsequently scrutinized and adjusted by different levels of education administration, until they are sent to the Treasury via the Finance Commission. At this stage the Treasury, in consultation with other relevant central government officials, prepares a financial statement based on fund availability and the government's policy priorities, the details of which are discussed and refined by relevant officials. The approval for these budget estimates is first obtained from the cabinet of ministers and subsequently from parliament. The funds for approved budgets are allocated in a form of a block grant to different provincial councils, which then divide the funds into different sectors (e.g., health, education, etc.). (Arunatilake and De Silva, 2005)

This process of determining funds incorporates all the undesirable elements of funding discussed in section 1.2.1. Although in theory initial budget estimates for schools are determined according to needs, the degree to which actual school needs are taken into account depends on the ability of school principals and others to identify the schools' funding needs. Further, fund requirements are determined according to guidelines provided by either the Finance Commission or the Treasury at the center. As such, there is little flexibility in

[7] As mentioned earlier, in 1987, education administration also was devolved from the center to the provinces under the 13th Amendment to the constitution. This study limits its analysis to the changes made under the EQI scheme.

[8] The Finance Commission is responsible for recommending budget allocations for the provinces and subsequently disbursing approved funds to the provinces.

requesting funds for needs outside those coming under the guidelines. In many instances, the school principals' inability to assess the needs of the school results in budget proposals that are based on the previous year's budget. The budgets that are forwarded by the lower levels are adjusted and pruned at higher levels at the discretion of administrative officials. Given government's recently experienced budget constraints, the limited availability of funds intensifies the need to prune budgets. As a result, the actual budget allocations may not reflect the needs of the schools. Here again, more enterprising principals would negotiate with the higher bureaucratic levels for additional funds, while others accept what is given to them. As shown earlier in section 2, this has resulted in wide disparities in the allocation of funds across schools.

4.2 Allocation of EQI Funds

In contrast to the process adopted for allocating other budget items, a fixed percentage of capital and recurrent budgets are assigned for financing the procurement of quality inputs. The recurrent and capital components of the EQI budget consist of 2 percent and 20 percent of the total national recurrent and capital expenditure budgets for primary and secondary education, respectively. The funds are allocated to schools according to a Norm-Based Unit Cost Resource Allocation Mechanism (NBUCRAM) based on the following factors: a) quality input norms produced by educationists; b) student populations; c) corrections for possible economies and diseconomies of scale; d) availability of different grade-cycles in schools; and e) allocation of funds for gradual capital improvements on a needs basis (World Bank, 2005). Of the recurrent EQI budget, 60 percent is allocated for consumables while 40 per cent is allocated for repair and maintenance (FC, 2005).

At the beginning of the year, the education administration decides the amount of money to be allocated for each school according to the earlier mentioned NBUCRAM formula. The amounts to be allocated to each school are determined by a three step process as detailed below:

Step 1: For each type of EQI – i.e., consumable, capital, etc. –, the share of funds to be allocated for different grade cycles are decided at the provincial level. For example, in 2005, the Central Province distributed the capital budget for EQI among the different school cycles as follows: primary – 15 percent, junior secondary – 35 percent, senior secondary – 30 percent, collegiate, arts – 5 percent and collegiate, science – 15 percent.

Step 2: Based on these percentages, weights are assigned to different school categories. For example, again for the capital component of the EQI budget in the Central province in 2005, the weight assigned for primary only school is 0.15, while a school with both primary and junior secondary grades will get a weight of 0.50 (that is, 0.15 + 0.35).

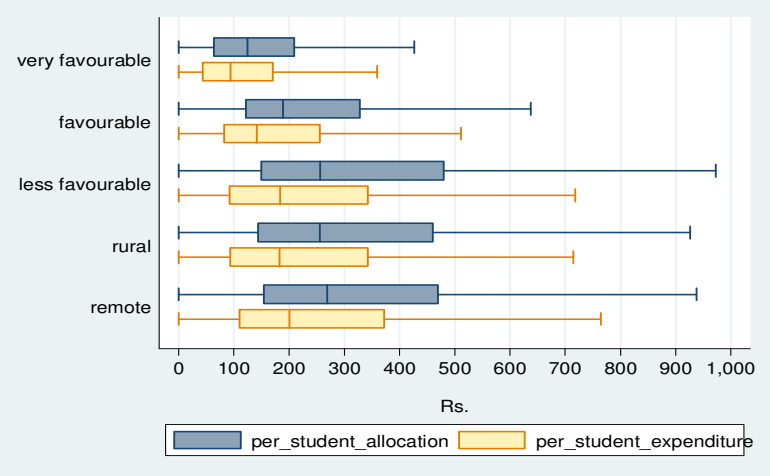
Based on these weights and the number of different types of schools in the province, the provincial authorities then determine how to distribute the funds across different school types.

Step 3: Within each school type, funds are distributed among schools based on the desired student populations for each school for each school type.[9] The allocations for different schools are then credited to the EQI accounts, which are operated by the schools.

4.3 Allocative efficiency of funds under EQI

Figures 2.a, 2.b and 2.c summarize per student allocation and expenditure of EQI funds by school size and location. As seen in the figure, the fund allocations incorporate many of the positive elements of formula-based funding, including differences based on student characteristics, availability of different school cycles, and school site differences, such as school size and location. Smaller schools, rural schools, and disadvantaged schools receive larger amounts of per student funds. This indicates that overall funds are distributed according to the goal of uplifting disadvantaged schools, taking into account economies of scale.

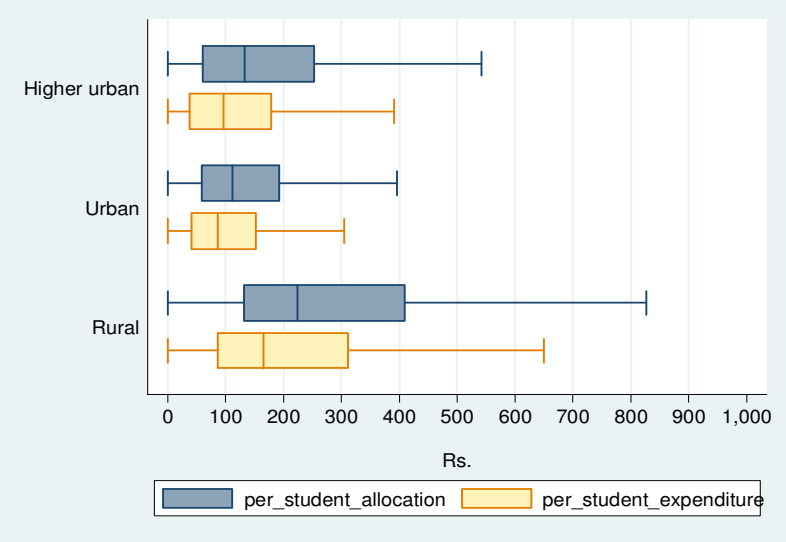
Figure 2.a - Distribution of per student EQI allocation and expenditure by type of school



Source: Own calculations, using school census data.
Note: Type of school - According to the categorization of schools by ministry under the circular 2005/01.
Excludes outliers

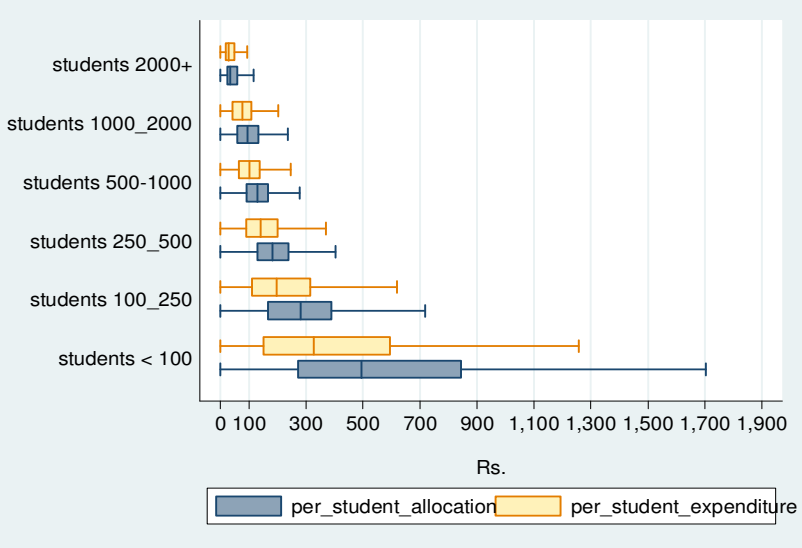
[9] This results in smaller schools getting a higher percent of the funds compared to the bigger schools.

Figure 2.b - Distribution of per student EQI allocation and expenditure by location of school



Source: Own calculations, using school census data. Note: Excludes outliers

Figure 2.c - Distribution of per student EQI allocation and expenditure by size of school



Source: Own calculations, using school census data. Note: Excludes outliers

4.4 Discussion

In the EQI scheme in Sri Lanka, the amount of funds that are decentralized is rather small, limited to just 2 percent of recurrent expenditure and 20 percent of capital expenditure. However, the funding mechanism for EQI is an improvement on the earlier system on several grounds. In this funding model, all similar schools receive equal treatment, but attention is given to differentiate according to student characteristics, school cycles, and school site differences. In addition, provincial level education officials are given some authority to determine how the funds should be distributed among different grade cycles.

However, the formula used to allocate funds is not easily understood. Although

information on the funding formula is available at the provincial and zonal education offices, this information is not easily accessible. On the positive side, detailed information on the allocations and expenditure of EQI funds are available through the school census data. However information on the objectives and policies underpinning the allocation of EQI funds are not readily available, which makes analyzing the allocative effectiveness of EQI funds difficult. Further, as shown in figures 2.a, 2.b and 2.c, not all funds distributed are utilized by schools. We further explore reasons for this in section 6.0.

5. Is distribution of EQI funds progressive?

This section focuses on the second research question and examines the distribution of the EQI expenditure from the household perspective. Even when funds are distributed across schools according to specified goals, at the household level fund allocations may not be progressive if children do not have equal access to schools. Here we examine the distribution of EQI funds across households using benefit incidence analysis.

5.1 Data and methods

The data for this analysis come from two sources. First, 2004 School Census data is used to calculate per-student EQI expenditures for different schooling levels in each province. School census data provides information on the EQI expenditures for different school cycles for each school. It also provides information on the number of students enrolled in each school cycle per school. This information is used to calculate per student EQI expenditure for each school cycle in each province. Second, national level income and expenditure data are used to rank individuals according to per capita income levels using the Consumer Finance Survey Data by the Central Bank (CFS 2003/2004).[10] This data set also provides information on children's schooling for each household. The per-student EQI expenditure estimates by school cycle and province are imputed in the CFS for each school-going child in the household. [11] This can then be used to first calculate the totals and then the shares of EQI-expenditure per school cycle per household. The distribution curves are drawn per share of EQI expenditure to examine the equity of EQI expenditures at the national and provincial levels across different schooling cycles.

Four different schooling levels are considered in the analysis corresponding to the four cycles of education in the country. These include primary (grades 1 to 5), junior secondary (grades 6 to 9), senior secondary (grades 10-11), and collegiate (grades 12 and 13) levels of education. At the collegiate level, the data was analyzed separately for the arts

[10] Household expenditure was used as a proxy for income.
[11] This means that for each school-going child in the household, an amount equivalent to the per-capita EQI expenditure is imputed, based on the schooling level of the child by province.

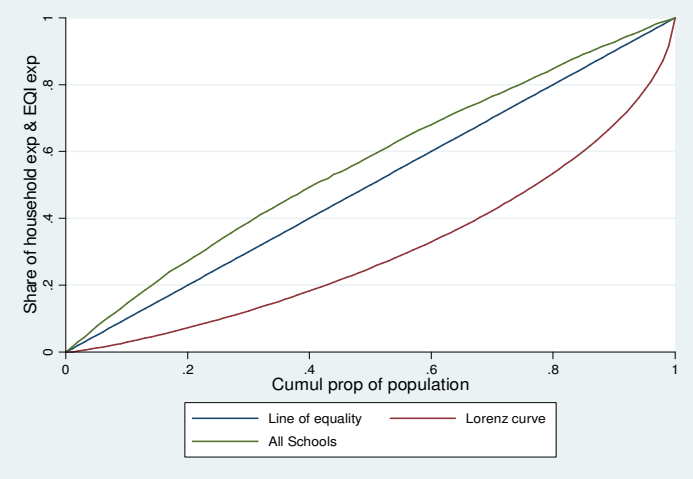
and science streams as evidence suggests that science education at the collegiate level is not available in many schools in the rural areas.

5.2 Results

5.2.1 National Level Results

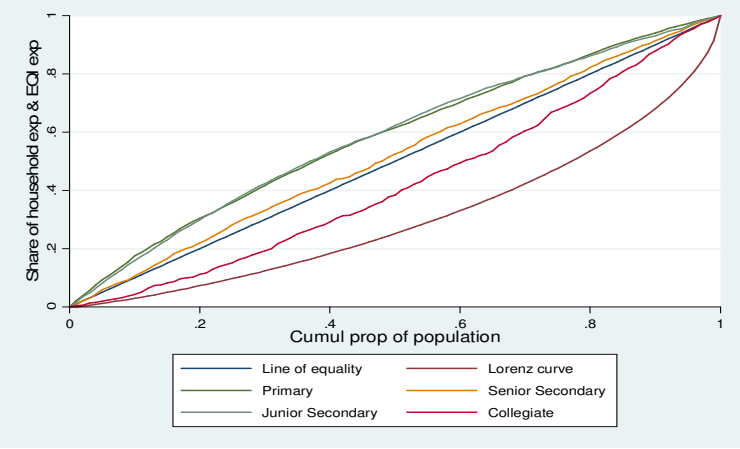
At the national level, EQI expenditure for all school cycles is progressive. When separated into different school cycles, results are progressive for primary and junior secondary school cycles and equitable for senior secondary school cycle (see Figures 3.a and 3.b). The EQI expenditure on the collegiate school cycle is weakly progressive – that is, it reduces the relative gap between the rich and the poor. When the collegiate school cycle is separated into the arts and science streams it is evident that the expenditure on the science stream is regressive (see Figure 3.c). A similar analysis for allocation of EQI funds shows similar results.

Figure 3.a - Distribution of EQI expenditure – all schools



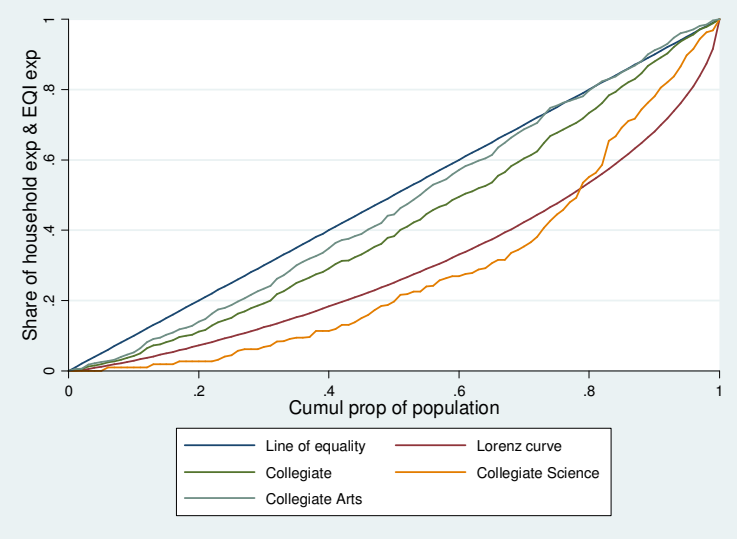
Source: Own calculations using Central Bank CFS data and School census data.

Figure 3. b – Distribution of EQI expenditure by education cycle



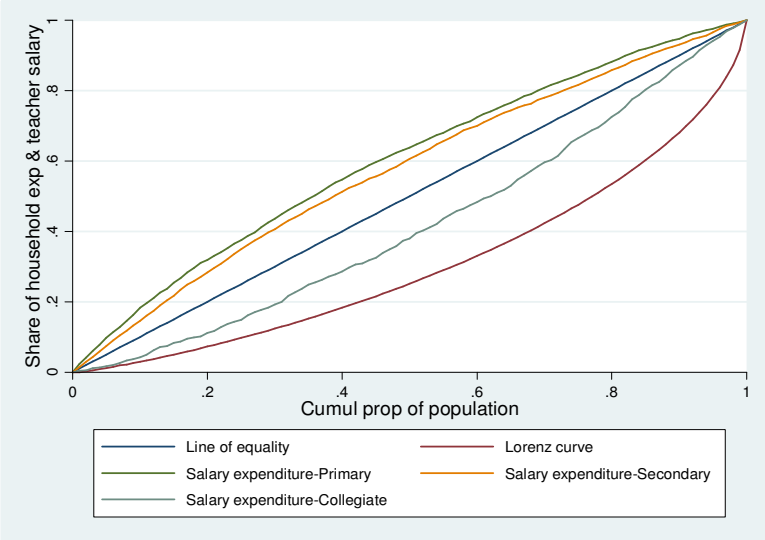
Source: Own calculations using Central Bank CFS data and School census data.

Figure 3. c – Distribution of EQI expenditure at the collegiate level by education stream



Source: Own calculations using Central Bank CFS data and School census data.

Figure 4. a - Distribution of teacher salaries by education cycle



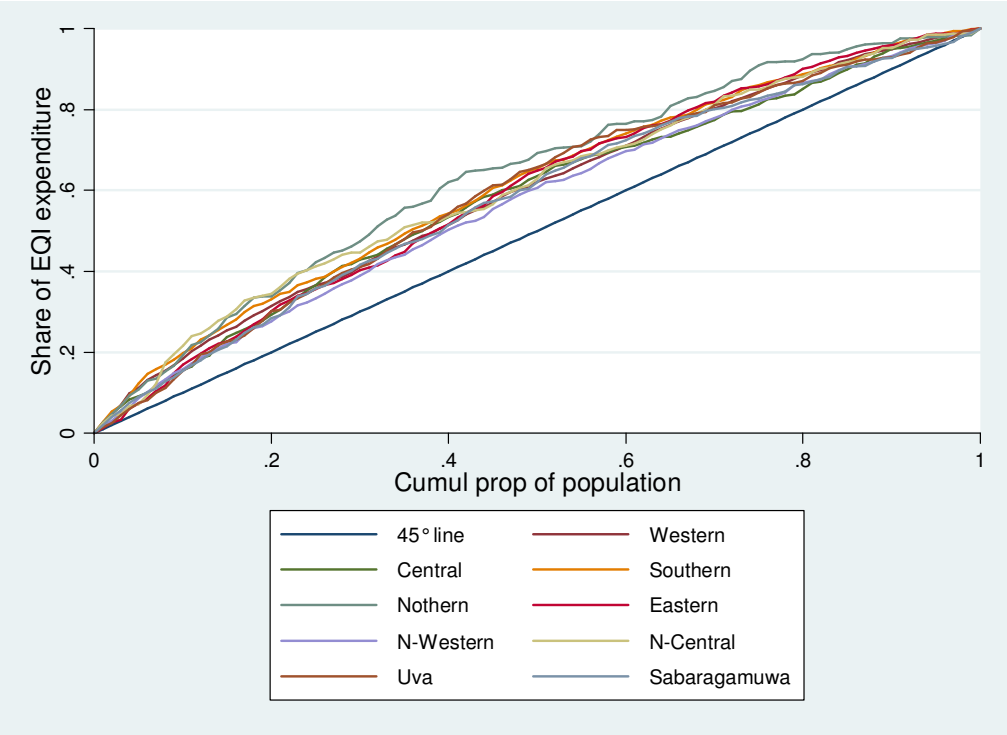
Source: Own calculations using School Census and CFS data.
Note: School census data does not permit separation by junior/ senior secondary school cycles.

Figure 4.a gives the corresponding expenditure shares for different school cycles for teacher salaries using CFS data. As can be seen from the figure, these follow the same patterns as the EQI expenditure shares, indicating little difference in the distribution patterns of these two types of educational expenditures. This further illustrates the need to eliminate existing disparities in the system.

A separate analysis that examined the incidence of EQI distribution against the incidence of school attendance for different school cycles, showed that incidence of EQI distribution is more progressive than the simple incidence of school attendance. This also

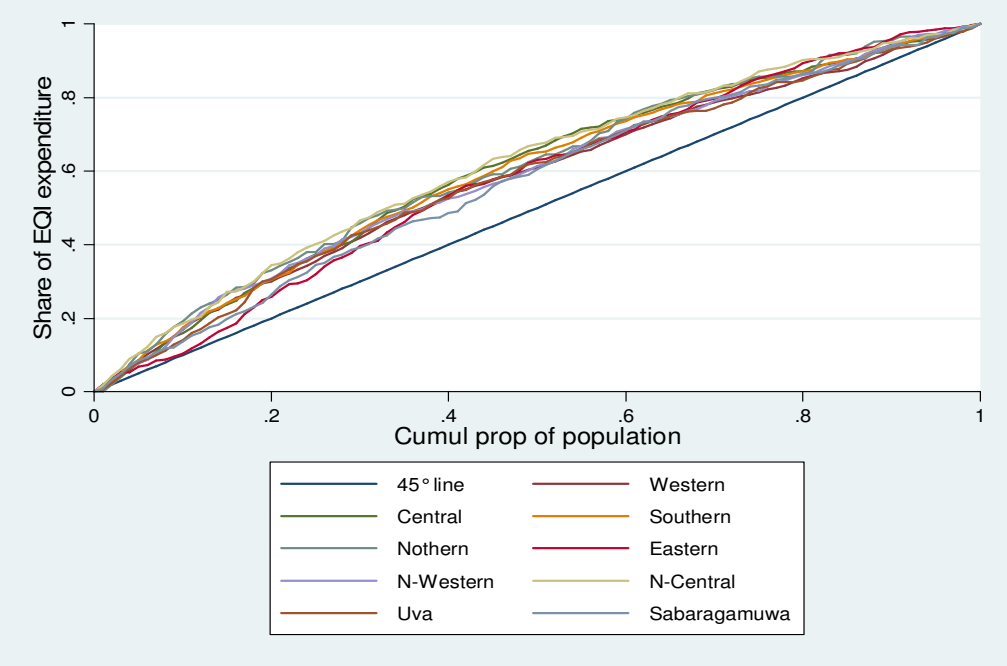
shows that the EQI scheme favours disadvantaged schools and students.[12]

Figure 5.a - Distribution of EQI expenditure for primary grades by province



Source: Own calculations using School Census and CFS data.

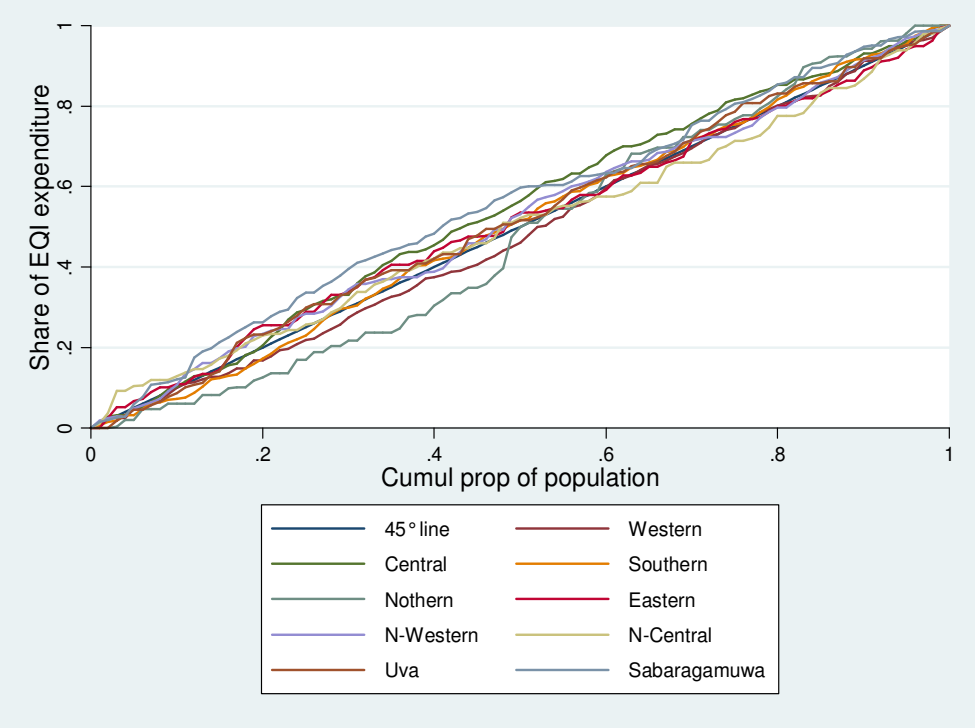
Figure 5. b - Distribution of EQI expenditure for junior secondary grades by province



Source: Own calculations using School Census and CFS data.

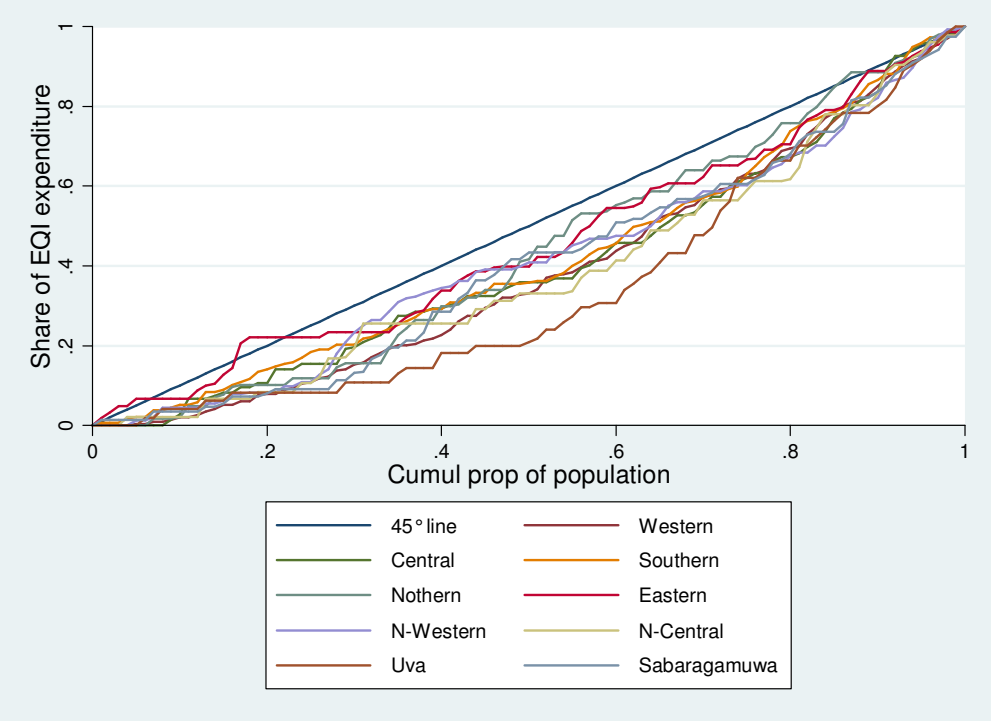
[12] Results are not shown.

Figure 5. c - Distribution of EQI expenditure for senior secondary grades by province



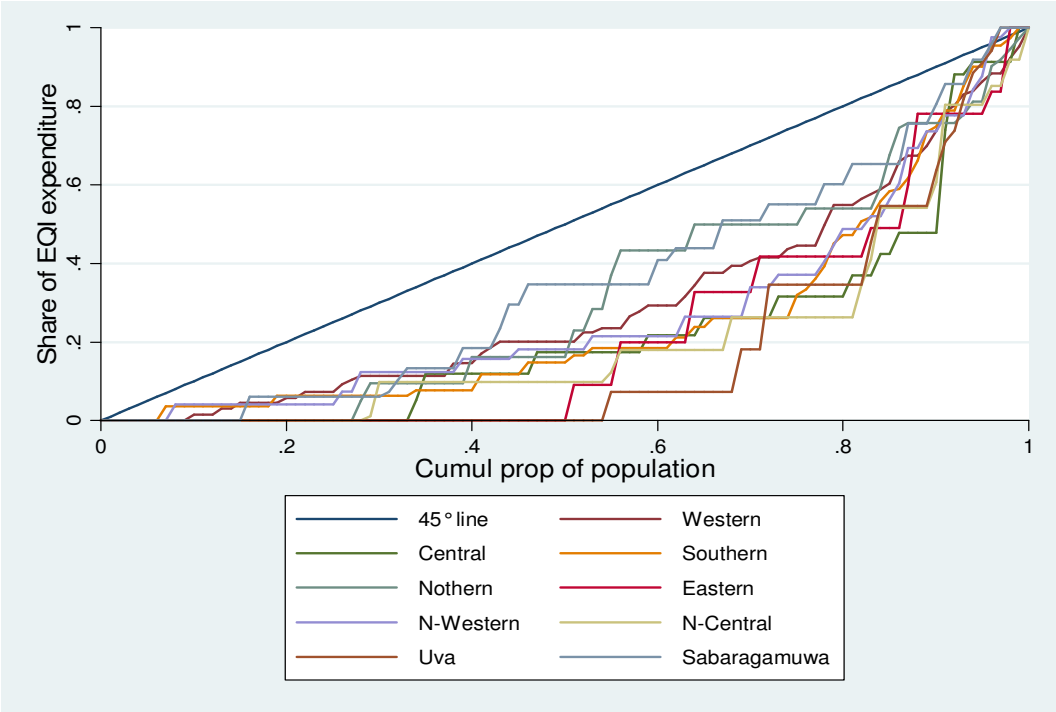
Source: Own calculations using School Census and CFS data.

Figure 5. d - Distribution of EQI expenditure for collegiate grades by province



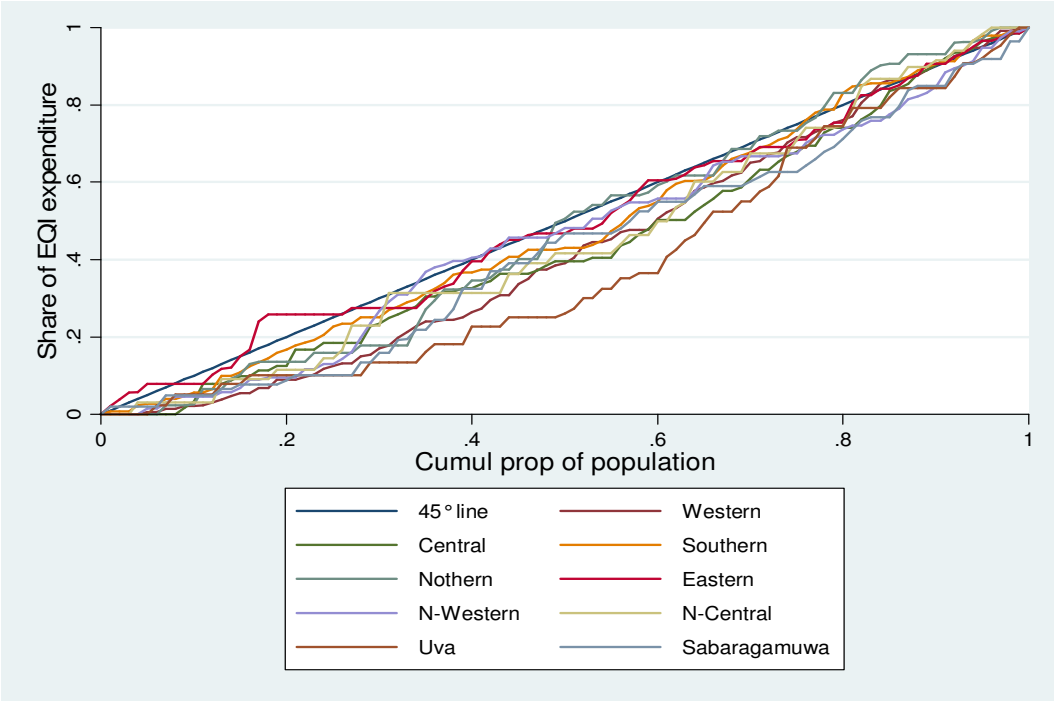
Source: Own calculations using School Census and CFS data.

Figure 5. e - Distribution of EQI expenditure for collegiate grades, science stream by province



Source: Own calculations using School Census and CFS data.

Figure 5 f - Distribution of EQI expenditure for collegiate grades, arts stream by province



Source: Own calculations using School Census and CFS data.

5.2.2 Provincial Level Results

The magnitude of progressivity, measured by the area between the concentration curves and the 45- degree line, changes across provinces, but they keep the same general pattern, as observed at the national level (see Figures 5.a – 5.f). The progressivity is lowest at higher school cycles. Within the collegiate level school cycle, the science stream is much more regressive than the arts stream. These results are further elaborated in table 1, which provides the estimates of Concentration and the Kakwani indices for the above graphs.[13] These indices are popularly used as a measure of inequality as they help to quantify the degree of income-related inequality in a specific variable. In the present study, it shows the degree to which EQI funding is targeted towards the poor. However, the concentration curve takes a hypothetical equal distribution of incomes as the benchmark for its comparisons, which in most instances is different from the actual distribution of incomes in a population. The Kakwani index, on the other hand, takes the actual distribution of incomes as the benchmark.[14] The results of the Concentration index show that at the collegiate level, the non-poor benefit more from EQI expenditure than the poor. The results of the Kakwani index indicate that the expenditure on the collegiate level science stream is regressive. The differences in distributions mainly reflect the poor enrolment of children at higher levels of education in less developed provinces, particularly in the science stream.

The lower progressivity at higher school cycles is partly due to lower enrolments at these school cycles in general. A variety of factors relating to supply side issues such as poor quality of education as well as demand side issues such as poverty and direct and indirect costs of education contribute to low enrollments, especially in higher school cycles (Arunatilake, 2006). In addition, even among those who participate in the higher school cycles, the enrollments are particularly poor in the science stream. This is partly due to low quality science and mathematics education available in most rural schools, which results in poor achievements in science and mathematics at the senior secondary level and the resulting non-enrolment at the science streams at the collegiate level. It is also due to lower access to collegiate level science stream education.[15]

[13] As EQI expenditure is a subsidy, a negative index indicates progressivity, while a positive index indicates regressivity.
[14] World Bank (2001)
[15] On average, only 25 per cent of schools offering collegiate level education offer science education (NEC, 2003).

Table 1. Progressivity in the distribution of EQI expenditure subsidy

	All School cycles	Primary cycle	Junior secondary cycle	Senior secondary cycle	Collegiate cycle	Collegiate cycle - Science	Collegiate cycle - Arts
	Concentration Index						
National							
EQI Expenditure	-0.12	-0.17	-0.17	-0.04	0.15	0.43	0.06
EQI Allocation	-0.12	-0.15	-0.17	-0.04	0.15	0.43	0.06
Provincial (EQI Expenditure)							
Western	-0.12	-0.18	-0.16	0.03	0.23	0.41	0.14
Central	-0.14	-0.17	-0.20	-0.08	0.19	0.55	0.13
Southern	-0.13	-0.22	-0.19	-0.01	0.17	0.49	0.05
Northern	-0.16	-0.29	-0.21	0.04	0.14	0.38	0.05
Eastern	-0.12	-0.19	-0.16	-0.02	0.09	0.55	0.02
N-Western	-0.11	-0.14	-0.17	-0.03	0.17	0.45	0.09
N-Central	-0.15	-0.21	-0.23	0.00	0.23	0.58	0.10
Uva	-0.12	-0.19	-0.16	-0.03	0.32	0.63	0.23
Sabaragamuwa	-0.13	-0.16	-0.14	-0.11	0.19	0.30	0.15
	Kakwani Progressivity Index						
National							
EQI Expenditure	-0.51	-0.56	-0.56	-0.43	-0.23	0.04	-0.33
EQI Allocation	-0.12	-0.15	-0.17	-0.04	0.15	0.43	0.06
Provincial (EQI Expenditure)							
Western	-0.53	-0.59	-0.57	-0.38	-0.18	0.00	-0.26
Central	-0.47	-0.50	-0.53	-0.41	-0.13	0.22	-0.20
Southern	-0.45	-0.54	-0.52	-0.33	-0.16	0.17	-0.27
Northern	-0.50	-0.63	-0.55	-0.30	-0.21	0.03	-0.29
Eastern	-0.46	-0.53	-0.49	-0.36	-0.24	0.22	-0.32
N-Western	-0.45	-0.48	-0.52	-0.37	-0.17	0.11	-0.26
N-Central	-0.49	-0.55	-0.57	-0.34	-0.12	0.24	-0.24
Uva	-0.43	-0.50	-0.47	-0.35	0.00	0.32	-0.08
Sabaragamuwa	-0.42	-0.46	-0.44	-0.40	-0.10	0.01	-0.15

Source: Own calculations using CFS 2003/2004 data.

5.3 Discussion

It is encouraging to see that the EQI expenditure is distributed equitably across the population for the most part, except at the collegiate level. The distribution of EQI expenditure is most progressive at the primary school cycle. This gradually decreases with more advanced school cycles. Given these results one might argue that it is more welfare-improving to direct more funds towards the primary school cycles. However, the main reason why the expenditure at the upper school cycles is less regressive is because of low school participation rates at these cycles. The need is for improving participation at these school cycles, in order to achieve the education goal of "functional literacy" for all. One means of increasing participation is by making schools more attractive places for teaching and learning. This requires more spending at the higher levels, not only on EQI but also on other areas of education inputs. At the same time, literature shows that poverty and direct and indirect costs of education also keep students away from school, especially at higher grades.

Special incentives should be provided for the less privileged to improve their demand for higher levels of education.

Table 2. School enrolment, by province

	Sri Lanka	Western	Central	Southern	Northern	Eastern	North-Western	North-Central	Uva	Sabara-gamuwa
Gross Enrolment										
Primary	100	100	100	99	106	101	102	99	103	99
Junior Secondary	97	100	97	100	89	91	94	97	97	93
Senior Secondary	73	63	74	76	81	75	74	78	69	86
Collegiate	42	43	37	51	73	38	44	38	34	31
Collegiate-science	11	14	6	14	23	6	11	11	7	9
Collegiate-arts/commerce	31	29	31	37	51	31	33	27	27	22
Net Enrolment										
	Sri Lanka	**Western**	**Central**	**Southern**	**Northern**	**Eastern**	**North-Western**	**North-Central**	**Uva**	**Sabara-gamuwa**
Primary	92	93	90	91	90	92	91	93	89	94
Junior Secondary	84	88	84	88	75	76	82	85	77	87
Senior Secondary	57	52	54	61	60	56	58	61	52	62
Collegiate	28	31	26	33	38	22	26	23	24	22
Collegiate-science	7	9	5	8	15	3	5	8	5	6
Collegiate-arts/ commerce	21	22	21	26	23	19	21	15	19	16

Source: Calculated using Central Bank CFS data.

As explained in section 3, the formula used to allocate EQI grants corrects for economies and diseconomies of scale (i.e., higher per student amounts are given to smaller schools and smaller per student amounts are given to bigger schools). The IES 2002 data does not provide information on the size and type of school attended by children. As such, the per student EQI expenditure levels calculated are averages for different sizes and types of schools. Since children from non-poor families are more likely to go to bigger schools in urban areas, the distribution of EQI expenditure may actually be more progressive than what is shown in figures 3.a – 3.c.

6. Management under Decentralized Decision Making

The third question deals with assessing how the concerns regarding decentralized management in a developing country setting are relevant in the case of Sri Lanka's EQI scheme. Based on the theoretical foundations given in section 1.2.3 specifically, we examine how a) weak capacity at the local level, measured by teacher and school characteristics, and school level management capacity; b) principal characteristics; c) community characteristics; and d) state-level administrative support affect the utilization rate of EQI funds.

6.1 Data

As discussed previously, the objective of this study is to examine management capacity of schools proxied by the rate of utilization of funds[16] allocated under the EQI scheme. Data for the analysis comes from two sources. The first data set was compiled by supplementing school census data for 2003 with primary and secondary data collected by the authors. However, one shortcoming in this data set is that it is restricted to schools in the Western Province (WP). This data set is henceforth referred to as the 2003-WP data. The school census data for 2004 include information on EQI allocations and expenditure at the school level. However, this data is limited to information available on school census data for 2004, as it was not possible to collect additional information for all the schools in the country.

6.1.1 Education Quality Inputs Data

Since 2004, as the school census includes information on EQI, EQI allocation and expenditure data was readily available for this year. For 2003, EQI-related data were collected from zonal education departments. Given the time and budget constraints involved, it was not possible to include all schools in the 2003 sample. A sample of schools was chosen from three randomly selected zonal education offices - Jayawardhenapura, Homagama and Horana -- within the Western Province. There were a total of 326 functioning schools in these three zones. Of these, we have full information on EQI fund allocations and expenditures for 266 schools and EQI data plus information from the principal's survey for 156 schools.

6.1.2 School Census Data

The Ministry of Education and Higher Education collects detailed yearly information on student populations, teachers, and available resources at the school level. In the more recent school census data (for the year 2004), information on allocation and expenditure of EQI funds are also available for all the schools in the country. This information was used to control for various teacher, student, and school characteristics.

6.1.3 Principals' Survey Data

As discussed in section 4.0, other than for school characteristics, community participation in decision-making at the school level and the capacity of the school education offices to administer and manage funds, also have the potential to influence the success of decentralized decision-making. Hence, in addition to the information obtained through the above two sources, we collected information from the schools to better understand their ability to use the funds allocated under the EQI scheme. For this purpose, a questionnaire

[16] The rate of utilization is calculated by dividing the expenditure on EQI by its allocation.

was designed based on findings of a literature review on implementing the EQI scheme and qualitative information obtained from school principals and education administrators at various levels.

6.1.4 Descriptive Statistics of the Sample

Table 5. Total and per student allocations of EQI grants and their expenditure, by type of school - 2004 School Census Data

		Number of schools	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max
				Total allocations				**Total Expenditure**		
All Schools		9,538	60,722	51,740	1,000	866,500	47,949	46,630	0	926,205
Size of school	< 100	2,797	29,668	38,331	1,000	866,500	20,878	28,929	0	670,700
	100-250	2,616	48,109	29,641	2,200	772,453	37,803	27,455	0	251,148
	250-500	1,854	66,135	32,182	6,333	712,787	54,188	32,730	0	238,571
	500-1000	1,313	93,273	44,101	14,312	757,630	74,742	49,472	0	926,205
	1000-2000	686	135,382	73,919	5,600	829,064	108,856	67,042	0	414,738
	2000+	272	119,036	76,922	16,047	585,192	98,435	76,339	0	814,482
Location of school	Higher urban	527	91,135	66,478	2,000	772,453	73,105	63,962	0	814,482
	Urban	336	87,412	62,481	6,707	790,000	68,860	49,296	0	301,298
	Rural	8,675	57,841	49,320	1,000	866,500	45,611	44,586	0	926,205
				Per student allocation				**Per student expenditure**		
All Schools		9,538	375	700	4	26,352	262	422	0	16,932
Size of school	< 100	2,797	778	1,173	12	26,352	493	694	0	16,932
	100-250	2,616	302	199	16	4,889	237	181	0	1,609
	250-500	1,854	190	100	22	2,519	155	94	0	721
	500-1000	1,313	136	66	20	1,334	109	69	0	982
	1000-2000	686	102	52	4	467	83	53	0	377
	2000+	272	45	33	4	272	37	31	0	272
Location of school	Higher urban	527	219	341	10	4,889	152	202	0	2,369
	Urban	336	187	252	15	1,931	145	209	0	1,897
	Rural	8,675	392	725	4	26,352	273	436	0	16,932

Source: Calculated using 2004 School Census data.

Table 6. EQI utilization rates by type of school - 2004 School Census Data

		Number of schools	Mean	Std. Dev.	Min	Max
All Schools		9,538	81	54	0	1,649
Size of School	< 100	2,797	76	64	0	1,529
	100-250	2,616	81	45	0	809
	250-500	1,854	84	44	0	631
	500-1000	1,313	82	46	0	825
	1000-2000	686	86	72	0	1,649
	2000+	272	87	68	0	1,031
Location of school	Higher urban	527	82	58	0	1,031
	Urban	336	84	51	0	631
	Rural	8,675	81	54	0	1,649

Source: Author's calculations using 2004 school census data.

Since the 2004 census data is available for all the schools, it is possible to make an

overall evaluation of the utilization rate of the funds made available for the EQI programme. The data shows that around Rs. 579 million were allocated for the EQI programme in 2004. However, of this amount only Rs. 457 million was actually used by schools, with Rs. 121 million being unspent.

On average, schools are allocated around Rs. 60,000 as EQI funds (for 2003 Western Province data this average was Rs. 51,000). However, the actual amount of funds received by schools varies from Rs. 1,000 to more than Rs. 800,000 (see Table 5).[17] The average utilization rate of EQI funds per school is 81 per cent. However, there are wide variations in the utilization rates across schools. The data shows that per-student allocation rates for smaller schools and rural schools are several times those given to bigger schools and schools in urban areas, indicating that funding formula favours small schools and rural schools. However, the absolute amounts of funds received by smaller schools, and rural schools are less possibly due to their fewer student numbers. Overall utilization rates were above 75 per cent; however, the utilization rate of funds is lower for smaller schools and for schools in rural areas, and there are wide variations in the utilization rates of schools (see Table 6).

As mentioned earlier, school census data for more recent years include information on allocation and expenditure of EQI funds for all the schools in the country. Further, this information is available for three categories of EQI funds, namely: EQI funds on consumption goods, capital goods, and repair and maintenance. Data shows that for some schools utilization rates are greater than 100 per cent (see Figures 6.a and 6.b). Since there were many missing values for expenditure of capital goods, only utilization of consumable goods were used for the analysis in 2004.

6.2 Empirical Model

Assume that each school i has an EQI utilization rate of URi which is determined by a combination of school and administrative level variables as shown in [eq2] below:

[eq2]: $UR_{iz} = \beta_{Ti}T_i + \beta_{Si}S_i + \beta_{Mi}M_i + \beta_{Pi}P_i + \beta_{ci}C_i + \beta_z Z_i + u_{iz}$

Where T_i is a vector of teacher characteristics, S_i is a vector of school characteristics, M_i is a vector of variables measuring the management capacity of the school, P_i is a vector of principal's characteristics and C_i is a vector of school community characteristics and finally Z is the education administration zone, the school belongs to, and U_{iz} is a random disturbance term. The terms β_{Ti}, β_{si}, β_{Mi} , β_{Pi}, β_{ci} and β_z are coefficients to be estimated.

We observe UR_{iz} with some degree of error. As such, rather than directly estimating

[17] For 2003 data this range was Rs.11,000 to Rs. 200,000.

UR_{iz} we estimate Y_{iz} , which denotes the category which U_{iz} belongs to as described in [eq3] below. The cut off points C1, C2, and C3 were categorized using xtile command in STATA to optimize the categorization of data. For the 2004 data the cut off points were 61, 96 and 100, for the 2003 data the cut off points were 45, 93 and 145.

[eq3]: $Y_{iz} = 1$ if $UR_{iz} < C1$

$Y_{iz} = 2$ if $UR_{iz} >= C1$ and $UR_{iz} < C2$

$Y_{iz} = 3$ if $UR_{iz} > = C2$ and $UR_{iz} < C3$, and

$Y_{iz} = 4$ if $UR_{iz} > = C3$,

Given this specification, the terms $\beta_{Ti,}$ $\beta_{si,}$ β_{Mi} , $\beta_{Pi,}$ β_{ci} and β_z can be estimated using an ordered-probit model assuming that U_i belongs to a normal distribution (Madala, 1983). In this study we estimated the above-mentioned ordered probit model using STATA and LIMDEP software packages.[18] The results of the estimated coefficients are described below.

The EQI expenditure amounts can depend on the school's EQI allocations. Hence, the dependent variable for the analysis is the EQI utilization rate, UR_i, for a particular school, calculated as shown in equation 1 below. This normalizes EQI expenditure of funds across schools.

[eq1]

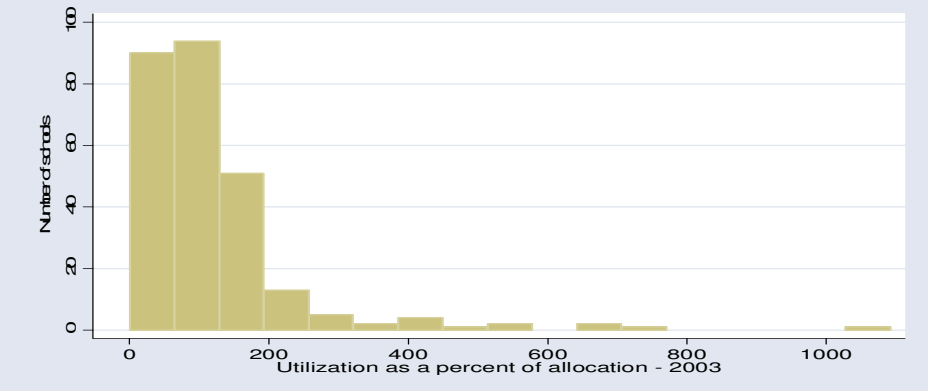
UR_i = [Total Expenditure on EQI for school i/ allocation for EQI funds for school i] * 100

If EQI expenditure denotes the expenditure within a year from fund allocations for the year, the EQI utilization rate should be a continuous variable between 0 and 100. Figure 6.a and figure 6.b depict the distribution of utilization rates in the sample for 2003 and 2004. These show that although many schools have fully utilized the funds allocated for the year, a fair proportion of schools also have very high utilization rates. According to education officials, this is partly due to use of funds brought forward from previous years. However, this explains utilization rate exceeding 100 only to a limited extent. For some schools the utilization rates exceed even 200. According to one official this is probably due to recording errors at the school level, which can happen due to lack of accounting knowledge. As a result, some expenditure items are double-counted, resulting in expenditures that exceed allocations. Also, albeit rarely, funds intended for other projects are sometimes credited to the EQI account, thereby increasing the expenditure of EQI as a percent of allocation.

[18] Initial regression was carried out using STATA. LIMDEP was used to calculate marginal effects for the ordered probit model. Coefficient calculations made using the two packages gave the same results. Controls on primary only, Secondary only and Secondary without A/L were also included in the regression.

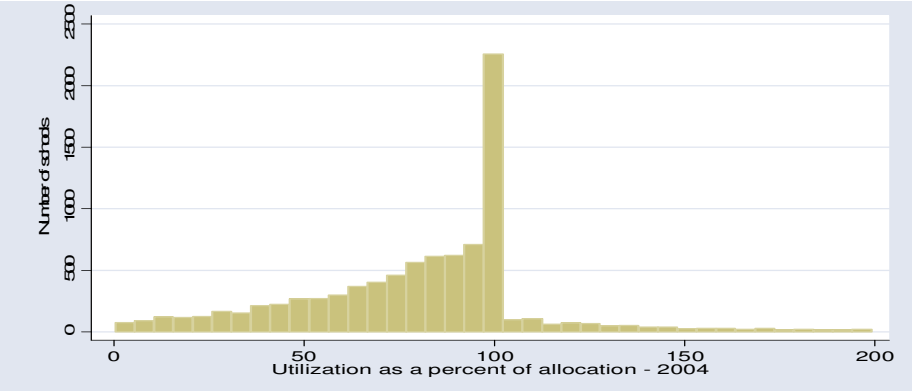
Given the lack of detailed information on expenditures, we are unable to correct for these possible errors in the data. To at least partly overcome the problem, we analyze an ordered probit model[19] where the dependent variable takes four levels --rather than a continuous variable -- as shown in [eq3] below.

Figure 6.a - Frequency distribution of EQI utilization rate of schools (266 schools) 2003



Source: Own calculations using EQI 2003 data

Figure 6.b – Distribution of utilization rate all EQI funds



Source: Own calculations using School Census data

6.3 Choice of variables and data

Based on information available through international experiences of decentralized education management, anecdotal evidence on the EQI programme and through discussions with divisional and zonal level education offices, several explanatory variables were identified as important in explaining funds utilization under the EQI scheme. The choice of these variables is discussed below. Variable descriptions and their descriptive statistics are given in tables 3 and 4 for 2003 and 2004 data respectively.

[19] Results estimated using an ordered logit model did not differ much from the results presented in the paper.

Table 3. Variable descriptions and descriptive statistics, 2003-WP data

	Variable description		Obs	Mean	Std. Dev.	Min	Max
Teacher Characteristics	% Excessive leave	% Teachers taking more than 25 days of leave a year	266	43.21	20.05	0	100
	% Male	Percent of male teachers	266	1.55	4.20	0	50
	Staff 6 or less	Staff 6 or less	266	0.11	0.31	0	1
	% Salary < Rs. 7000	% Teachers with salary <= Rs. 7,000	266	13.23	18.70	0	100
	% Salary < Rs. 9000	% Teachers with 7,000 < salary <= 9,000	266	27.78	14.24	0	79
	% Salary < Rs. 11000	% Teachers with > 9,000 salary <= 11,000	266	34.52	17.01	0	100
	% Salary > Rs. 11000	% Teachers with salary more than 11,000	266	24.47	15.60	0	100
School Characteristics	Primary only	School has only primary grades	266	0.14	0.35	0	1
	Secondary only	School has only secondary grades	266	0.05	0.21	0	1
	Lower sec. only	School has only lower secondary grades	266	0.55	0.50	0	1
	Permanent library	Permanent library and a qualified librarian present	266	0.13	0.34	0	1
	Science lab	Science labs and qualified science teachers available	266	0.70	0.46	0	1
	Special rooms	School has rooms for aesthetics or technical subjects	266	0.56	0.50	0	1
	Stud. per science/math	Secondary students per science /math teacher	266	57.30	44.02	0	277
	No science/math tch.	School has no science or math teacher	266	0.18	0.38	0	1
	Students per teacher -	Primary students per primary teacher	266	25.73	13.36	0	80
	Students per teacher	Secondary students per teacher - other than science	266	21.47	16.97	0	192
	0 to 250 students	Student population < = 250	266	0.42	0.49	0	1
	250 to 500 students	Student population between 250 to 500	266	0.23	0.42	0	1
	500-1000 students	Student population between 500 to 1000	266	0.18	0.39	0	1
	1000 plus students	Student population more than 1000	266	0.17	0.38	0	1
	Sinhalese Medium	Medium: Sinhalese or Sinhalese and English	266	0.95	0.22	0	1
	Mixed School	Both boys and girls are in school	266	0.94	0.24	0	1
Location and community	Rural	School is in a rural administrative zone	266	0.82	0.39	0	1
	Suburban	School is in a suburban administrative zone	266	0.12	0.33	0	1
	Urban	School is in a urban administrative zone	266	0.06	0.24	0	1
	Poor students	Half or more students are from poor backgrounds	266	0.53	0.50	0	1
	Private funds	School gets funds from private sources	156	0.29	0.45	0	1
EQI specific management problems	Principal trained	Principal trained adequately to use EQI funds	156	0.50	0.50	0	1
	With suppliers	Problems with suppliers	156	0.24	0.43	0	1
	With storage	Problems with storage	156	0.26	0.44	0	1
	With bank	Problems with bank	156	0.46	0.50	0	1
	With procedure	Problems with documentation	156	0.32	0.47	0	1
Principal's characteristics	Principal qualified	Principal in Sri Lanka principal's service	266	0.86	0.34	0	1
	Principal's experience	Principal's average years of experience	266	27.93	6.53	10	39
	Principal male	Principal is male	266	0.71	0.45	0	1
School Zones	Homagama	Homagama school zone	266	0.34	0.47	0	1
	J'pura	Jayawardenapura school zone	266	0.30	0.46	0	1
	Horana	Horana school zone	266	0.36	0.48	0	1

Source: Own calculations

Table 4. Description of variables and descriptive statistics for the 2004 School Census data

		Mean	Std. Dev.	
Teacher Characteristics	% Excessive leave	43.25	27.38	% Teachers taking more than 25 days of leave a year
	% Male	29.05	23.21	Percent of male teachers
	% Salary < Rs.7000	36.29	28.46	% Teachers with salary <= Rs. 7,000
	% Salary < Rs.9000	25.51	19.35	% Teachers with 7,000 < salary <= 9,000
	% Salary < Rs.11000	22.18	17.91	% Teachers with > 9,000 salary <= 11,000
	% Salary > Rs.11000	14.58	15.73	% Teachers with salary more than 11,000
School Characteristics	Primary only	0.31	0.46	School has only primary grades
	Secondary only	0.04	0.19	School has only secondary grades
	Primary and Secondary	0.65	0.48	School has both primary and secondary grades
	AL science classes	0.07	0.25	School has collegiate level classes
	St ratio - primary	21.05	13.99	Primary students per primary teacher
	St ratio -science and math	52.82	57.02	Science and math students per teacher
	St ratio -English	84.29	98.11	English students per teacher
	0 to 100 students	0.30	0.46	Student population < = 100
	100-250 students	0.27	0.44	Student population between 100-250
	250-500 students	0.20	0.40	Student population more than 250
	500 plus students	0.24	0.43	Student population > 500
	Well facilitated school	0.15	0.36	School graded as "well facilitated" in 2005
	Facilitated school	0.26	0.44	School graded as "facilitated" in 2005
	Less facilitated school	0.59	0.49	School not graded as "well facilitated" or "facilitated" in 2005
	Had inspection	0.85	0.36	Had at least 1 inspection in 2004
Principal's Characteristics	Principal qualified	0.71	0.45	Qualified as a principal in Sri Lanka principal's service
	Principal's experience	23.82	7.43	Principal's years of experience
	Principal male	0.78	0.41	Principal is male
EQI specific	EQI in 1 inst	0.31	0.46	EQI in 1 installment
	EQI in 2 inst	0.34	0.47	EQI in 2 installments
	EQI in 3 inst	0.22	0.42	EQI in 3 installments
	EQI in more than 3 inst	0.13	0.34	EQI in more than 3 installments
Location and Community	Western province	0.15	0.36	Western province
	Central province	0.15	0.36	Central province
	Eastern province	0.10	0.30	Eastern province
	North central province	0.07	0.26	North central province
	North western province	0.14	0.34	North western province
	Sabaragamuwa	0.12	0.33	Sabaragamuwa
	Southern province	0.12	0.32	Southern province
	Uva province	0.05	0.22	Uva province

Source: Own calculations, using 2004 School Census data

6.3.1 School Level Capacity: Teacher Characteristics

The school census data provides a range of information on the quality of the teaching staff available at the school level. Three variables that were thought to best characterize the teaching staff – variables relating to salary, leave, and gender – were used. Teacher level information was aggregated to the school level by taking percentages over the total teaching staff.

Salary could affect EQI utilization rate in two ways. A high percentage of low salaried teachers indicates that the school is endowed with inexperienced new teachers, who are also less qualified. They are possibly less capable of identifying and utilizing EQI funds. At present newly recruited teachers are deployed from the center according to deficits and excesses in teacher supply in schools. Many schools, especially those in rural areas, have difficulty in retaining teachers. Hence, as experienced teachers transfer out, teachers in difficult areas tend to be new and inexperienced. Further, teachers who qualify for transfers waste time at various educational offices competing for limited vacancies in popular schools, thus creating productivity losses. The combined effects of lack of experience and motivation of teachers compelled to teach in difficult areas could reduce teachers' effort levels. This could also have a negative effect on EQI utilization. However, many education officials noted that some newly qualified teachers are highly motivated and are better at making use of EQI in the classrooms than older teachers.

Schools that have a high percentage of teachers taking excessive amounts of leave would have a negative effect on the EQI utilization rate. Teachers' extended absences would reduce their ability to take time to identify and use EQI.

The effect of gender on EQI utilization rate is again indecisive. Consultations with education authorities revealed, that in rural areas especially, although female teachers are better at using EQI in the class, they are less proactive compared to male teachers in identifying EQI goods in the market.

6.3.2 School Level Capacity – School Characteristics

The school census data provides detailed information on schools including their popularity, size, and availability of facilities. Dichotomous variables were included to control for differences in school cycle representation in schools. For 2003 data, the information on school facilities were summarized into three variables relating to the availability of facilities (see Table 4 for details). In the 2004 data, school characteristics were categorized using the Education Ministry's categorization of schools according to their facilities, namely; "well

facilitated schools", "facilitated schools", and "less facilitated schools".[20] The student-teacher ratio for science and mathematics in the relevant grade levels were included to capture the workload given to teachers in these subjects. Variables were also included to capture the student-teacher ratios in primary grades, and student teacher ratios for non-science and mathematics subjects in the lower secondary grades.

Smaller schools are expected have lower EQI utilization rates. Despite their small size they are required to adhere to almost the same procedures adhered to by larger schools. As such, their administrative work load is quite high. Also, as a result of smaller staff size, the number of teachers available to share the work load is low. To add, although larger schools – schools with more than 400 students -- are allowed to hire an assistant to help with the EQI procedures, principals of smaller schools have to manage without assistants.

Schools with better facilities are expected to have higher EQI utilization rates. This is because teachers in these schools will find it easier to use EQI.

Schools with lower student-teacher ratios are expected to influence EQI utilization rates positively. Discussions with school administrators revealed that a high ratio of students per teacher can affect the use of educational quality inputs in two ways. First, when teachers are responsible for a higher number of students, they are less able to devote time for lesson planning and are thus more likely to use lecture-based teaching. Second, congested classrooms give less physical space for activity- based learning, thus reducing the use of EQI. It is assumed that teachers in these schools would have more time to devote to identifying EQI needs and they are better able to use EQI goods given more complementary resources.

6.3.3 School level capacity - EQI specific management problems

In addition to the above-mentioned variables, several variables were also included to capture the difficulty faced by schools in adhering to guidelines given by the Ministry of Education in the identification and purchase of EQI. Since this information was obtained from the principal's survey, it was only possible to include these in the analysis of 2003 data.

Schools indicating any kind of management problem are expected to influence EQI utilization rate negatively.

6.3.4 Principal's characteristics

The efficient functioning of the EQI scheme depends largely on the managerial

[20] The Education Ministry's categorization also includes deficient and very deficient school categories; these schools were included under less facilitated schools in the analysis.

capacity of the school principal. Hence, it is likely that the education qualifications, experience and other characteristics of the principal influences functioning of the EQI scheme. The following principal's characteristics were included in the regression: (1) qualification; (2) years of experience; and (3) gender.

Schools with better qualified principals are expected to have higher EQI utilization rates. Experienced principals are possibly more able to guide schools to make use of funds available under EQI. Grauwe (2006) explains that the gender of the principal may affect school level management in two ways. On one hand, female principals may be more capable to summon the cooperation of the teachers by being supportive and collegial and as such may be better at managing schools. On the other hand, male principals may be more adept at withstanding the pressures of management, given less domestic responsibilities.

6.3.5 Community characteristics

Several variables were used to capture the community level characteristics in 2003 data set. These include a dummy indicating whether the school is located in a *pradeshiya sabaa* (i.e., a rural council). A dichotomous variable indicating whether more than half of the student population came from poor households, and a dichotomous variable indicating whether the school was able to raise funds through private activities were used in the study.

Schools in rural areas are expected to have lower EQI utilization rates, as they have higher transaction costs in procuring EQI goods.

6.3.6 State-administration of funds

The school divisional and zonal level education offices can play a big role in the utilization of funds coming under the EQI scheme. These offices are responsible for training school level individuals for using EQI funds as well as monitoring the adherence to proper procedures regarding the use of EQI funds. To control for this, dummy variables were used to identify the school zones in the sample.

In addition to the variables used for the 2003 data, two variables on the state-administrative aspects of EQI funds were used in the regressions using 2004 census data. The first variable indicates whether the school was inspected by central administration, and the second indicates the number of EQI fund installments the schools were given.[21]

[21] Many school Principals indicated that delayed disbursement of EQI funds is a constraint on EQI utilization.

6.4 Results – 2003 Data

Table 7. What affects utilization rate - results ordered probit for 2003 Western Province data[1]

Variable description		All Schools			Schools with Secondary grades			All schools without survey information		
		Coef.		Robust Std. Err.	Coef.		Robust Std. Err.	Coef.		Robust Std. Err.
	% Excessive leave	0.000		0.006	0.005		0.007	0.003		0.004
	% Male	0.044		0.049	0.006		0.152	-0.020		0.030
Teacher characteristics	Staff 6 or less	0.472		0.525	9.416	***	2.780	0.651	*	0.393
	% Salary < Rs.7000	-0.009		0.010	0.003		0.012	-0.002		0.006
	% Salary < Rs.9000	-0.005		0.010	-0.013		0.011	0.002		0.008
	% Salary < Rs.11000	-0.003		0.010	-0.009		0.011	-0.007		0.007
	Permanent library	-0.012		0.312	-0.032		0.306	0.108		0.217
	Science lab	0.086		0.342	0.073		0.358	-0.059		0.238
School characteristics	Special subject rooms	0.299		0.282	0.398		0.289	0.117		0.215
	St ratio -science and math	-0.005	*	0.003	-0.003		0.003	-0.005	*	0.003
	No science/math teacher	0.141		0.893	0.464		0.877	-0.206		0.540
	St ratio - primary	-0.005		0.012	-0.020		0.016	0.002		0.009
	St ratio - secondary	-0.005		0.008	0.000		0.008	-0.013	*	0.007
	0 to 250 students	-0.005		0.282	0.004		0.331	0.231		0.221
	250 to 500 students	-0.212		0.297	-0.337		0.315	0.045		0.215
	500-1000 students	0.157		0.263	-0.123		0.271	0.187		0.197
Location and community	Rural administration	-0.600	**	0.275	-0.550	**	0.270	-0.457	**	0.217
	Proportion poor students [2]	0.709	**	0.316	1.030	***	0.334			
	School has other funds	0.024		0.196	0.187		0.202			
	Principal trained in QI	0.298		0.186	0.203		0.205			
EQI specific management problems	With suppliers	0.048		0.241	-0.239		0.277			
	With storage	0.212		0.199	0.127		0.212			
	With bank account	-0.181		0.222	0.018		0.238			
	With procedure	-0.278		0.215	-0.329		0.227			
	Principal qualified	-0.380		0.386	-0.358		0.385	-0.149		0.232
Principal's characteristics	Principal's experience	-0.006		0.016	-0.001		0.017	0.005		0.012
	Principal male	0.070		0.215	0.015		0.218	0.222		0.171
School zones	J'pura	-0.244		0.240	-0.236		0.260	0.046		0.193
	Horana	-1.023	***	0.274	-1.192	***	0.296	-0.642	***	0.190
	cut1	-1.914		1.008	-1.962		1.094	-1.524		0.743
	cut2	-1.202		1.010	-1.250		1.105	-0.764		0.746
	cut3	-0.397		1.005	-0.409		1.100	-0.015		0.749
Sample size		172			152			266		
Psedo R2		0.116			0.1509			0.0734		

Note: 1. Statistical significant at 1, 5, and 10 per cent are given by ***, ** and * respectively. 2. This variable indicates the subjective evaluation of the school principal on the proportion of "poor" students in the school.
Source: Author's calculations

Results of the ordered probit regressions carried out are given in table 7. Results were obtained for three different samples. The results shown in column I are for all schools for which data were available from the school census, EQI utilization rates, and principals' survey. Column II details results for the sample of schools with secondary grades (i.e., schools with only primary grades are excluded from this sample) with information from the principal's survey. The last column presents results for all schools, but without the principal's

survey information. As seen by Pseudo R2 statistics the model fit is better when information from the principals' survey is included in the analysis. Since the sample results for all schools and for that with only secondary schools were largely similar, only the results for the sample with all schools is described below.[22]

6.4.1 School Level Capacity

Most teacher and school characteristics included did not significantly affect the utilization rate of funds. As expected, schools that have a higher ratio of students per science and mathematics teacher were worse at utilizing EQI funds. However, the influence of this variable on the utilization rate was small.[23]

6.4.2 Principal's Characteristics

Principal's characteristics and EQI-specific management problems did not affect EQI utilization significantly.

6.4.3 Community Characteristics

As expected, schools located in rural administrative areas found it more difficult to utilize EQI funds. However, schools where more than half the student population came from "poor backgrounds" – self evaluated as perceived by the principal - were better at utilizing EQI funds. The influence of both these variables on the utilization rate was large. This is an encouraging finding, as this indicates that the schools are compensating for lack of private resources using EQI funds.

6.4.4 State Administration

The variables included to identify school zones had significant results. This variable captures both community level characteristics as well as zonal level administrative characteristics. The results indicate that these factors have a large influence on utilization rates.

[22] The marginal effects for this regression are available on request.

[23] Very small schools with less than 6 teachers were better at utilizing EQI funds. This is expected as these schools were given special support by the state administration in the utilization of EQI funds. EQI-specific management problems did not affect EQI utilization significantly.

Table 8. Correlates of utilization rate - results of an ordered probit model – 2004 School Census data

	All schools			Primary schools			Secondary schools			Collegiate level schools		
	Coef.		Robust Std. Err.	Coef.		Robust Std. Err.	Coef.		Robust Std. Err.	Coef.		Robust Std. Err.
% Excessive leave	-0.001		0.000	-0.001	*	0.001	0.001		0.001	0.000		0.001
% Male	-0.001		0.001	0.000		0.001	-0.002	**	0.001	-0.001		0.002
% Salary < Rs.7000	0.001		0.001	0.002	**	0.001	0.000		0.002	0.002		0.002
% Salary < Rs.9000	0.002	**	0.001	0.002	*	0.001	0.001		0.002	0.000		0.003
% Salary < Rs.11000	0.000		0.001	0.000		0.001	-0.001		0.002	0.003		0.004
% Salary > Rs.11000												
St ratio - primary	-0.003	**	0.001	-0.003	*	0.002	-0.002		0.002	-0.007	**	0.003
St ratio -science and maths	0.000		0.000	-		-	0.000		0.000	0.000		0.000
St ratio -English	0.000		0.000	-		-	0.000		0.000	0.000	**	0.000
0 to 100 students	-0.033		0.058	-0.162	*	0.090	-0.160		0.104	0.059		0.061
100-250 students	0.035		0.047	-0.075		0.089	-0.053		0.082			
250-500 students	0.054		0.039				0.006		0.068			
500 plus students												
Well facilitated school												
Facilitated school	-0.057		0.041				0.014		0.071	-0.064		0.059
Less facilitated school	-0.077	*	0.042	0.096		0.062	0.012		0.070	-0.174	**	0.070
Had inspection	0.102	***	0.034	0.046		0.050	0.127	**	0.057	0.127		0.080
Principal qualified	0.025		0.029	-0.026		0.050	0.017		0.044	0.147	**	0.065
Principal's experience	-0.001		0.002	0.002		0.003	-0.004		0.003	0.000		0.004
Principal male	0.077	***	0.029	0.090	*	0.048	0.069		0.047	0.069		0.062
EQI in 1 inst	-0.042		0.049	0.072		0.095	-0.122		0.075	0.014		0.097
EQI in 2 inst	0.064		0.047	0.152	*	0.091	-0.025		0.070	0.183	*	0.094
EQI in 3 inst	0.029		0.047	0.042		0.091	-0.041		0.069	0.163	*	0.090
EQI in more than 3 inst												
Western												
Central	-0.213	***	0.043	-0.015		0.074	-0.396	***	0.071	-0.218	**	0.086
Eastern	-0.201	***	0.040	0.075		0.063	-0.393	***	0.063	-0.305	***	0.098
North Central	-0.011		0.048	0.224	***	0.083	-0.210	***	0.077	0.012		0.102
North Western	-0.292	***	0.040	0.000		0.086	-0.465	***	0.059	-0.312	***	0.075
Sabaragamuwa	-0.252	***	0.047	-0.109		0.080	-0.388	***	0.073	-0.219	**	0.101
Southern	-0.211	***	0.047	0.361	***	0.101	-0.501	***	0.071	-0.262	***	0.090
Uva	-0.573	***	0.072	-0.110		0.122	-0.833	***	0.117	-0.786	***	0.142
cut1	-0.827		0.118	-0.322		0.179	-1.246		0.299	-0.671		0.273
cut2	-0.138		0.117	0.290		0.179	-0.538		0.298	0.110		0.273
cut3	0.773		0.118	1.345		0.179	0.296		0.298	1.032		0.274
Sample size	8624			2682			3733			2209		
Psedo R2	0.012			0.010			0.02			0.018		
McKelvey and Zavoina's R2	0.059			0.063			0.08			0.071		

Source: Own calculations, using 2004 School Census data
Note: Variable to control school cycle representation in schools were included in the regression.

This section will detail data and results for the model using 2004 school census data. Separate regressions were estimated for all schools, primary schools, schools with grades up to lower secondary level and schools with grades up to upper secondary level. Regression results are given in Table 8.

6.5 Results – 2004 Data

6.5.1 School Level Capacity

Similar to the findings of the 2003 WP data, the results show that schools with high student-teacher ratios were worse at utilizing EQI funds, especially at the primary level. The results for 2004 data show that schools with a higher percentage of low salary teachers are better at EQI utilization rates, especially in primary schools. This could possibly be due to newer, more motivated teachers in rural areas and may also be attributed to the fact newer teachers are better trained in using EQI. These results also show that smaller primary schools and less facilitated collegiate level schools have lower EQI utilization rates.

6.5.2 Principal's Characteristics

Unlike for 2003 WP data, in the 2004 data principal's characteristics had a relatively large and significant effect on EQI utilization rates, especially for collegiate level schools. The results show that schools with qualified principals have higher EQI utilization rates. The results also show that primary schools with male principals have a higher utilization rate.

6.5.3 Community Level Characteristics and State-administration

The only variable which was significant across the samples with large marginal effects was the provincial level variable. This indicates that, relative to the Western Province schools in all other provinces are worse at utilizing EQI funds, especially at higher levels of schooling. In addition, there is some evidence that part of the low utilization rate of EQI funds are due to central administrative problems. The results show that schools that received the funds in fewer installments were better at utilizing funds than those that obtained funds in several installments. The results also show that schools that were inspected in 2004 had higher EQI utilization rates.

6.6 Sensitivity Analysis

Two alternate models of the analysis were considered to assess the sensitivity of the results and to improve on the significance of the variable.

6.6.1 Tobit Specification model

Using an ordered probit model takes away the natural variability of the utilization rate. To overcome this problem we estimated the same regressions using a tobit specification where utilization rates higher than 100 were censored at 100. The results for these regressions were not different for those using ordered probit models in terms of direction. The results were more convincing in terms of significance. Results are available on request.

6.6.2 Model without Province Level Dummies

As mentioned earlier, the dummy variables used to control for location are highly significant for all the regressions. However, we have little information on why these results are significant. In order to examine the variation in the structural variables more closely, a set of regressions were estimated using an ordered probit model, but without the location variables. These sets of regressions in general revealed results similar to the first set of regressions. Results are available upon request.

6.7 Discussion

Following international literature, the study assesses the factors affecting school-based management (proxied by EQI utilization) in four areas, namely; the school capacity, principal's characteristics, community characteristics, and state-administrative support.

High student-teacher ratios, smaller primary schools, and less facilitated collegiate level schools have lower EQI utilization rates. Contrary to expectations, the results also show that at the primary level, schools with a higher percentage of low salary teachers were better at using EQI funds. This is perhaps due to the fact that they also tend to be younger and fresh out of training.

High student-teacher ratios could result from two contrasting situations. Both popular urban schools and rural small schools have high student-teacher ratios. Further studies will need to be done to identify the reasons for low utilization of EQI funds in these two types of schools with high student-teacher ratios. Anecdotal evidence suggests that both the lack of teachers to identify and use EQI in the class rooms and the lack of space for class room activity due to over crowding reduce the use of EQI funds. This suggests that alleviating problems of teacher shortages and high teacher turnover could improve the EQI utilization rates in small rural schools.

In accord with international findings, results show that schools with qualified principals are better at utilizing EQI. At the primary cycle male principals also have a higher utilization rate. The first result is expected and reveals the need to recruit good quality principals. The second result for primary schools supports the hypothesis that male principals are more able to withstand the pressures of school level management, given less domestic responsibilities.

Results for both samples show that location and community-level characteristics have a large influence on EQI utilization rates. The provincial level results of the regression analysis indicate that the utilization rate of EQI expenditures is lower in all provinces relative to that of the utilization rate in the Western Province, which is the most developed province

in the country and where Colombo, the capital of Sri Lanka, is situated. This highlights the need to take policy initiatives to improve EQI funds utilization in provinces outside the Western Province.

The results show that efficient allocation of funds and inspections improve fund utilization rates. The first result is expected. However, it is not clear whether inspection resulted in providing support to schools to improve EQI utilization or whether the main intention of the inspection was compliance. If the former is the case, results are in agreement with the international literature which points to the fact that external support is needed to improve utilization rate of EQI funds.

7. Summary and Conclusions

Formula-based funding and decentralized management of schools as a means of improving school quality and performance has received renewed interest in the late 1990s, especially among developed countries. International experience suggests that needs-based resource allocation through formula funding and decentralized management of these funds has great potential for improving resource availability and management of schools. However, the success of these schemes depend on the level and depth of decentralization, availability of information for implementing and monitoring these schemes, availability of basic resources, strength of school-support systems, and the ability of the central government to motivate local level players to achieve identified education goals.

This study uses school census and other primary and secondary data to examine the success of the Educational Quality Inputs Scheme in Sri Lanka that envisage improving school performance through formula based-funding and decentralized management of schools. The study specifically examines: 1) the equitability in the distribution of EQI expenditure across schools and households; and 2) the management capacity of schools using EQI utilization rates as a proxy. The findings of the study are summarized below.

The study finds that the model used to allocate EQI funds is an improvement on the funding models previously practiced on several accounts. Under EQI, similar schools are treated equally and student characteristics, school cycles, and school site differences are taken into account when allocating funds. However, the funding formula and the information on policies underpinning the formula design are not clear, making it difficult to assess whether funding goals are met.

Descriptive analysis of EQI expenditure shows that as intended, smaller schools, rural schools, and more disadvantaged schools receive and spend a higher per capita

allocation per student. However, around 20 percent of these funds are left unspent.[24] This shows that allocating funds equitably is not sufficient, and in improving school resources the funds need to be properly utilized. Some of the same factors that affected the uneven distribution of funds under the earlier funding models result in uneven funds utilization under formula-based funding. For example, in the earlier system, more enterprising principals were able to acquire increased funds and thus provide better resources for the schools. Under formula-based funding, although all similar schools receive equal amounts of funds, they are left unspent partly due to the lack of competence of the principals. This shows that fundamental management resources are a necessary condition to improve resources at the school level under any funding model.

Distribution of EQI expenditure is progressive at the primary and junior secondary levels, and equitable at the senior secondary level. However, at the collegiate level, especially the science stream, it is regressive. Enrolment rates show that the main reason for inequity at higher school cycles is low enrolment rates, especially in science education. This shows the need to improve efforts to keep children in school and to improve access to science education. Although one might argue for re-directing expenditure at the collegiate level to lower school cycles, this will result in further increasing the education disparities at higher school cycles and reducing the relevance of education for children from poorer households.

The study findings support the hypothesis that state-level monitoring and support is needed for the success of education management at the school level. The findings also support, albeit less conclusively, the hypothesis that qualified principals and adequate levels of school level human and physical resources are needed for the success of education management at the school level.

8. Recommendations and Future Research Needs

Data from the 2004 school census shows that close to Rs. 121.8 million of funds allocated for the EQI programme is left unspent. On average, schools were able to spend 81 percent of these funds. However, this average utilization rate varies widely across schools. The results of the study suggest several ways to improve EQI funds utilization. Both external and internal factors affect utilization rates of funds. This section provides policy recommendations for improving the implementation of the EQI scheme. Four general areas are considered: a) improvements to the EQI procedure; b) improvements in data collection and use of EQI related data; c) improvements in providing support services to schools in the use of EQI funds; and d) improving physical and human resources available at schools.

[24] Unutilized money is accumulated in the school EQI account. The following year's allocations do not depend on the amounts spent the previous year.

8.1 Review of Existing EQI Policies and Procedures

Improvements to the EQI procedures should be done at several levels. First, delays in funds disbursement from the center should be minimized. Second, complementary policies should be implemented to improve access to education especially at the higher school cycles - and moreso in the science stream – so that EQI funds are distributed more equitably. Third, the policies and procedures of the EQI scheme should be simplified. Particular assistance should be given to small and rural schools to utilize EQI. There is a need to develop differentiated procedures that are more suitable for small rural schools and for schools receiving very small amount of funds. Fourth, it is also important to see whether these funds were actually spent for improving teaching and learning processors. Unfortunately, the data available for this study did not allow us to examine the effectiveness of this expenditure.

8.2 Using EQI Related Data More Effectively

The results strongly suggest provincial and zonal level differences in the use of EQI funds. More detailed analysis needs to be done to examine the reasons for provincial and zonal level differences in EQI utilization rates.

The inclusion of EQI-related information in computerized formats in the school census data since 2004 is a positive sign. This improves the availability of EQI-related data for evaluation purposes. However, the available data is limited to the allocations and expenditures at school level. Additional data on the use of funds for different purposes and EQI related training provided for teachers would also improve the usability of EQI data for evaluation purposes. There is a need to revise the questionnaire used to gather EQI-related information so that data collection is purposeful.

The schools, zonal educational offices, and the Ministry of Education collect large amounts of information on the allocation and expenditure of EQI funds. However, this data is not effectively used for evaluation purposes with the intent to improve the efficiency and effectiveness of the EQI programme. The statistical divisions at all levels of education administration should do routine analysis to examine collected data and use results to improve EQI implementation.

Examining EQI utilization rates shows that a fair share of schools have EQI utilization rates that are larger than 100. Discussions with education officials suggested that this is partly due to incorrect account-keeping at the school level. A simple calculation of utilization rates would have shown possible errors in data, while closer monitoring could improve accuracy of collected data. Software should be developed that produces summary statistics

of collected data to allow for easy monitoring and accuracy of collected data.

At present the school authorities are accountable to the zonal level education officers, not to the students and the school community. The zonal level officials sometimes do not have the capacity to check the records of all schools that come under their purview. Also, as shown previously, despite detailed recording, the expenditure data on EQI funds are not clean. This suggests the need to make the EQI procedure simpler, and the data collection on EQI expenditure more purposeful. That is, sufficient data should be collected on the expenditure of EQI goods not only for accountability purposes, but also to facilitate monitoring and evaluation, so the EQI scheme can be assessed and improved from time to time. For example, EQI-related data collected through MOE should be used to identify schools with very poor utilization rates. A special task force should be assigned to investigate the reasons for poor utilization of EQI funds, with the intention of improving utilization rates.

8.3 Improving Administrative Capacity at School Level- Especially for small rural Schools

The results show that poor training and lack of qualified principals lower funds utilization. Discussions with education officials, particularly at the school and the zonal level, show that training is often insufficient. Also, high turnover leads trained principals or teachers to move to different schools, leaving their first school without trained personnel. Training is often theoretical and short-term and is therefore limited in its usefulness in practice. Zonal offices, especially in rural areas, should have personnel especially trained to train principals and teachers at the school level and to assist them in the use of EQI goods.

Improving management capacity at small rural schools is never easy. Given the high turnover of teachers and principals at rural small schools and the difficulties in allocating better qualified teachers to these areas, improving human resource capacities for small rural schools would be very difficult. Given this, an alternate solution must be sought to provide these necessary skills. One option would be to assign consultants to groups of small rural schools needing technical assistance, while another would be to provide special incentives to retain teachers at these schools, or for groups of smaller schools to allow decision-making to take place in school clusters.

The provincial and zonal level administrative divisions could play a large role in improving the use of EQI at the school level. Strengthening administrative capacity at these levels has the potential to improve the utilization of EQI funds.

8.4 Improving Resource Availability at School Level

The results suggest that schools with fewer facilities are poorer at utilizing EQI funds. Special attention should be given to improve core facilities at disadvantaged schools.

9. Limitations of the Study

This study examined the factors affecting the utilization of funds given under the EQI scheme introduced in Sri Lanka. The study only examined the level of fund utilization. A high level of utilization of EQI funds may not always relate to efficient funds use for improving the teaching and learning processors. This could happen when funds are utilized for inputs that do not add much value for the teaching and learning processors. This measure also ignores the distributive efficiency of funds across different types of EQI goods. This measure of efficiency assumes that all expenditures on EQI are on productive uses and that schools purchase EQI goods according to priority needs.

The study used expenditure as a percentage of allocation as the dependent variable. Discussions with education officials revealed that the total allocated amounts do not reach schools in time due to liquidity problems at the macro level. Hence, part of the observed low utilization levels of EQI funds may be due to funds not reaching the schools, and not schools not being able to use the funds.

References

Asian Development Bank (ADB), 2005, Technical Assistance Report, Technical Assistance – Democratic Socialist Republic of Sri Lanka: Preparing the Education Sector Development Program, Project Number: 39293, December.

Arunatilake, Nisha, 2006, "Education participation in Sri Lanka – Why all are not in school", International Journal of Education Research, 45: 137-152.

Arunatilake, Nisha and Roshani de Silva, 2005, "Overview of Education Budgeting and Resource Allocation Processes in Sri Lanka", http://www.commonwealtheducationfund.org/srilanka.html, Commonwealth Education Fund.

Behrman, J. R., Deolalikar, A. B. and Soon, L. 2002. "Promoting effective schooling through education decentralization in Bangladesh, Indonesia and Philippines" *ERD Working Paper No. 23*, Economics and Research Department, Asian Development Bank.

Burki, S. J., G. E. Perry, and W. R. Dillinger, 1999, "Beyond the Center: Decentralizing the State", World Bank Latin American and Caribbean Studies, The World Bank, Washigton. D.C.

Caldwell, Brian J., 1998, "Self-managing Schools and Improved Learning Outcomes", Department of Employment, Education, Training and Youth Affairs, Canberra, Australia.

De Grauwe, Anton., 2005, "Improving the quality of education through school-based management: learning from international experiences", Review of Education, 51: 269-287.

De Mel, 2006, "Sri Lanka Report: Status of education MDG implementation", February 8th, available at http://southasia.oneworld.net/article/view/127169/1/7921

Eskeland G. S. and D. Filmer, 2002, "Autonomy, Participation, and Learning in Argentine Schools", Policy Research Working Paper, 2766, The World Bank, Washington, D.C.

FC, 2005, "Guidelines for presentation of Request for Finances For the Fiscal Year 2005".

Galiani S. P. Gertler and E. Schargrodsky (2005), "School Decentralization: Helping the Good Get Better, but Leaving the Poor Behind",

Galiani, S. and E. Schargrodsky (2002), "Evaluating the Impact of School Decentralization on Education Quality", Economia, 2(2), pp 275 –302.

Gropello, E., 2004. Education Decentralization and Accountability Relationships in Latin America. *World Bank Policy Research Working Paper* 3453, Washington DC: The World Bank.

Gunnarsson, V., Orazem P., Sánchez M., Verdisco A., 2004. Does school decentralization raise student outcomes?: Theory and evidence on the roles of school autonomy and community participation. *Working Paper No. 04005*, Iowa State University, USA: Department of Economics.

Hirosato, Yasushi., 2001, "New Challenges for Educational Development and Cooperation in Asia in the 21st Century", Journal of International Cooperation in Education, Vol.4 No.2 (2001).

Karunaratne, Sunethra, 2002, "An Independent Evaluation on the Impact of distribution and usage of quality inputs in schools and their utilization in classrooms", M.G. Consultants (Pvt.) Ltd., Colombo.

Maddala, G. S., 1983, Limited Dependent and Qualitative Variables in Econometrics, Cambridge University Press, New York, USA.

Medagama, R. S., 1999, Perspectives in Education, The next Decade. Economic Review 25 (8/9): 32-34. Colombo, Sri Lanka: The People's Bank.

MoE, 2004, Present Education System and the Management Structure. Ministry of Education, Government of Sri Lanka. www.moe.gov.lk.

MoE, 2002c, Education for All National Action Plan, Sri Lanka, Ministry of Human Resources, Education and Cultural Affairs, Battaramulla, Sri Lanka.

NEC, 2003, Proposals for a National Policy Framework on General Education In Sri Lanka, National Education Commission, Colombo, Sri Lanka.

NEREC, 2004, "National Assessment of Achievement of Grade Four Pupils in Sri Lanka", NEREC, University of Colombo, Colombo.

Perera, W.J., 1999, "Move Towards School Autonomy: Can School Based Management Help Achieve It?", Economic Review 25 (8/9): 26-31, Colombo, Sri Lanka: The People's Bank.

Ross, K. N., Levačić, R. (Eds.), 1999. *Needs- based resource allocation in education – via formula funding of schools*. Paris, France: UNESCO, International Institute for Educational Planning.

Sawada, Yasuyuki., 2000, "Community Participation, teacher effort and educational outcome: The case of El Salvador's EDUCO Program", Working Paper No. 307, William Davidson Institute. Development Research Group, The World Bank and Department of Advanced Social and International Studies, University of Tokyo, Komaba.

Wijesundara, S., 1998, "Recent Reforms in Primary education: Sri Lanka", ANTRIEP, Jan-June.

World Bank, 2005, Treasures of the Education System in Sri Lanka, June 30, World Bank, Colombo.

World Bank, 2001, "Quantitative Techniques for Health Equity Analysis" http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTHEALTHNUTRITIONANDPOP