A WORLD BANK COUNTRY STUDY

Education in Ethiopia

Strengthening the Foundation for Sustainable Progress

THE WORLD BANK

A WORLD BANK COUNTRY STUDY

Education in Ethiopia

Strengthening the Foundation for Sustainable Progress

THE WORLD BANK
Washington, D.C.

Manufactured in the United States of America
First Printing: June 2005

printed on recycled paper

1 2 3 4 5 07 06 05

ISBN-10: 0-8213-6226-7 ISBN-13: 978-0-8213-6226-6
eISBN: 0-8213-6227-5
ISSN: 0253-2123 DOI: 10.1596/978-0-8213-6226-6

Cover photo by Michael Foley

Library of Congress Cataloging-in-Publication Data has been requested.

Contents

LIST OF TABLES

List of Tables (continued)

List of Tables (continued)

List of Tables (continued)

List of Figures

List of Figures (continued)

Box

Foreword

This study provides a detailed snapshot of the education sector up to 2001–02, and for some aspects of the sector, up to 2002–03. Like similar Education Country Status Reports (CSRs) for other countries, it takes advantage of both administrative data and information from household surveys to document key dimensions of the sector, particularly primary and secondary education, focusing on costs, finance, and service delivery, and their impact on learning achievement, in an effort to discover potentially important areas for further policy development.[1]

Well-developed sector strategies, underpinned by the kind of thorough analysis presented in this study, have become increasingly important as governments renew their commitment to reduce poverty and develop detailed strategies, and as the international donor community pledges to provide a larger part of the needed financial resources and to provide it in ways which maximize governments' own powers of decisionmaking. In Ethiopia, the Sustainable Development and Poverty Reduction Programme (SDPRP) provides the overarching framework for poverty reduction and the Education Sector Development Plans feed into this. The results of the analyses undertaken for the Ethiopian Education CSR report are being used in preparation of the Government's most recent version of the Plan for 2005/06 to 2010/11.

The SDPRP requires the sector to progress toward universal primary education, improve the quality of instruction and learning achievements throughout the system, and produce a trained workforce that is responsive, in quantity and skills mix, to the demands of the country's modernizing economy. At the same time, decentralization is opening the way for regional and woreda governments (and through them, local communities) to take greater responsibility, financial and otherwise, for managing their own affairs, including the delivery of social services such as education. In responding to the challenges, many questions face the education sector, including:

- Is the current education policy framework adequate for fulfilling the high expectations?
- What resources are available to achieve the stated goals and are they sufficient to meet the requirements; and if not, how will the gap between resource availability and need be closed?
- What changes in the financing of education, in resource allocation across subsectors and schooling inputs, and in the arrangements for service delivery will help the education system to develop over the long run in a financially and pedagogically sound manner?

The analysis in the report suggests that pressures on resources in the sector do necessitate some re-ordering of the immediate objectives and the adoption of some alternative modes of service delivery, as well as more financial resources.

1. A summary of this document is published, with translation into Amharic, under the same title as a World Bank Africa Region Human Development Department Working Paper. The publication is available free-of-charge upon request to Ms. Southsavy V. Nakhavanit.

The study has resulted from collaboration between members of the Ministry of Education and the World Bank and has been funded in part by the Norwegian Education Trust Fund. I am pleased that this collaboration was initiated early in the process and that it was maintained through all the subsequent stages of collecting and analyzing data, report writing and dissemination, and policy dialog. This interaction is critical not only for undertaking the analyses but also for ensuring that the important issues raised receive consideration at the highest appropriate levels of Government.

More broadly, it is noteworthy that World Bank engagement in educational development in Ethiopia dates back to the 1960s. Since then, many projects and programs have been supported including the Government's Education Sector Development Programmes I and II. The most recent support has been for the Post Secondary Education Project which aims to help improve the quality of the university system and parts of technical and vocational education and training. This financial support for projects and programs has provided continuity in the Bank's engagement in policy development and implementation in the sector over many years.

In addition to project financing, World Bank assistance to client countries also takes the form of analytical activities and advice. In the case of Ethiopia, this publication, the larger report, and a recent study of higher education, are all examples of such assistance. Like project and program financing, the ultimate objective of these activities is to help countries to expand educational opportunities while improving quality throughout the system. Unlike these projects and programs, however, this type of assistance focuses on improving understanding of the education sector and diagnosing major constraints on its further development so as to help support the search for appropriate policy responses. It creates a larger knowledge base for deepening the current understanding of the education system, for engaging a diverse audience in dialog on education sector policies, and for developing a shared vision for the future.

In an effort to widen further the dissemination and discussion a summary of this report has been published separately in Amharic as well as in English. It is my hope that the publication of the full report as well as the summary in an easily available format will make a small but effective contribution to the country's overall efforts to define educational policies which will have a positive impact on reducing poverty in Ethiopia.

Ishac Diwan
Country Director for Ethiopia
World Bank

Acknowledgments

This report owes its origin to an agreement in 2002 between Woiz. Genet Zewdie, Ethiopia's Minister of Education and Arvil Van Adams, then the sector manager for human development operations for Ethiopia at the World Bank, to embark on a stock-taking study of education in the country. Ethiopia's Second Education Sector Development Program was then drawing to a close and it was felt that such a study would provide timely input for policy dialog regarding the next phase of the sector's development. Accordingly, the Ethiopian government and the World Bank organized a joint effort to prepare the study. The work was led on the Ethiopian side by Setotaw Yiman, Head of the Federal Ministry of Education's Programming and Planning Department, under Woiz. Genet's overall direction and support from Ato Derege Terefe and Dr Teshome Yizengaw, the Vice Ministers of Education; and on the World Bank side by Jee-Peng Tan, a Lead Economist in the Africa Region's Human Development Department, under the overall guidance of the following managers in the Region: Arvil Van Adams, Laura Frigenti and Ishac Diwan.

The Ethiopian team was structured in two parts: a Steering Committee to provide overall direction for the study and guidance on policy development; and a Technical Working Group to collect and analyze data and contribute to report writing. The Steering Committee was chaired by Setotaw Yiman and included Awash Gebru, Belete Demissie, Kassaw Ali, Mebratu Birman, and Workiye Tegegn; the Technical Working group was led by Damte Demeke and consisted of Adefris Belachew, Almaz Beyene, Amare Bizuneh, Getachew Tadesse, Getahun Workneh, Masresha Geleta, Mulugeta Mekonnen, and Teshome Lemma. As the work progressed, additional help came from Aleazar Tilahun as well as Yezid Reshid and his colleagues in the Education Management Information System (EMIS) panel at the Oromiya Bureau of Education. Many people outside the Ministry of Education also helped by sharing with the team data and documents that would otherwise have been inaccessible. They include Jutta Franz and Horst Sommer of the German Technical Cooperation (GTZ); Berndt Sandhaas of Institute for International Cooperation of the German Adult Education Association; Mulat Demeke of the Addis Ababa University; Alebachew Tiruneh; and Tesfaye Kelemework and Thomas Tilson of the United States Agency for International Development. Various staff at the Ethiopian Central Statistical Authority facilitated access to the household datasets used in this report.

The World Bank team consisted of Gerard Lassibille, Julie Schaffner, Andrew Dabalen, Tenzin Chhoeda, and Kiong Hock Lee. Getahun Gebru and Gary Theisen, task team leader for education in Ethiopia, provided invaluable support and facilitated the team's interactions with Ethiopian policymakers and donor representatives in the country; Mesfin Girma answered our questions on the public finance data and helped closed many of the gaps; and Mamy Rakotomalala, Lianqin Wang and Dina Abu-Ghaida prepared and documented the work on the Ethiopia Education Policy Simulation Model. The visits between Addis Ababa and Washington, D.C., which the team members exchanged in the course of this work were arranged with skill and cheerfulness by Eleni Albejo and Southsavy V. Nakhavanit. The report was edited by Deidre Ruffino and was processed for publication with help from Cornelia Jesse, Elsie Maka, and Southsavy V. Nakhavanit.

The report has benefited from feedback from Jeni Klugman and Jamil Salmi, the World Bank's formal reviewers for the report. Very useful comments were also received from Ishac

Diwan, Laura Frigenti, Getahun Gebru, Dina Abu-Ghraib, Trina Haque, Gary Theisen, and other participants at a formal review of the report at the World Bank. The report was subsequently presented at various meetings in Ethiopia, including two for donor representatives, one for regional bureau heads and some of their staff along with officials from the federal Ministry of Education, and one for high-level Ethiopian policymakers and researchers. Feedback from the participants at these fora has helped to remove factual inaccuracies and improve our understanding of the report's findings.

The report was financed by the Government of Ethiopia through contributions in staff time, the World Bank and the Government of Norway through a grant channeled via the Norwegian Education Trust Fund to support educational development in Africa.

Abbreviations and Acronyms

ANDM	Amhara Nationality Democratic Movement
BESO	Basic Education System Overhaul
BRAC	Bangladesh Rural Advancement Committee
DHS	Demographic and Health Survey
EFA	Education for All
EMIS	Education Management Information System
EPLF	Eritrean People's Liberation Front
EPRDF	Ethiopia Peoples' Revolutionary Democratic Front
ERHS	Ethiopia Rural Household Survey
ESACLFS	Ethiopia Stand Alone Child Labor Force Survey
ESDP	Education Sector Development Program
GDP	Gross Domestic Product
GER	Gross Enrollment Ratio
HICES	Household Income and Consumption Expenditure Survey
HIPC	Heavily Indebted Poor Countries
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome
IDA	International Development Association
IMF	International Monetary Fund
IMPACT	Instructional Management by Parents, Communities and Teachers
LFS	Labor Force Survey
MDGs	Millennium Development Goals
MOE	Ministry of Education
MOFED	Ministry of Finance and Economic Development
OECD	Organization for Economic Cooperation and Development
OPDO	Oromo People's Democratic Organization
PRSP	Poverty Reduction Strategy Paper
PRSC	Poverty Reduction Support Credit
SDPRP	Sustainable Development and Poverty Reduction Programme
SEPDO	South Ethiopia Peoples' Democratic Organization
TGE	Transitional Government of Ethiopia
TPLF	Tigray People's Liberation Front
TTC	Teacher Training College
TTI	Teacher Training Institute
TVET	Technical and Vocational Education and Training
UNESCO-UIS	United Nations Educational, Scientific and Cultural Organization
WMS	Welfare Monitoring Survey

CURRENCY EQUIVALENTS

(Exchange Rate Effective August 6, 2004)

Currency Unit	=	Birr
Birr 8.45	=	US$1
US$1	=	1.46275 SDR

FISCAL YEAR

July 8 — July 7

Executive Summary

Ethiopia emerged from civil war in 1991. The government that replaced the communist regime introduced a new constitution in 1994 to formalize the creation of a federal structure of government, and organized the country's first multiparty elections in 1995. These momentous political reforms were accompanied by major changes in economic management policy whose impact has been to help reverse more than two decades of persistent decline in the real per capita gross domestic product. The country's profound transformation creates promising conditions for social progress. The obstacles are many, however. Ethiopia is one of the poorest countries in the world today; in 2004 incomes barely exceeded $100 per head. An overwhelming 80 percent of the population ekes out a living from a mostly rain-fed agriculture, and an estimated 44 percent of the country's nearly 70 million people survive below the poverty line. On the economic front, the country's fortunes are highly vulnerable to external economic shocks because of their heavy dependence on just one major export, coffee. Droughts have occurred at the rate of one every three years during the past decade, putting at risk the lives of millions of Ethiopians.

Despite these daunting difficulties, the optimism today about the country's future is palpable. The government has made poverty reduction the centerpiece of its development strategy and it has continued to advance the reform of governmental structure, functions, and finances. These contextual factors are highly pertinent for education. Ethiopia's Sustainable Development and Poverty Reduction Program (SDPRP, equivalent to what in some other countries is called a Poverty Reduction Strategy Paper [PRSP]) envisions a key role for the sector, placing on it the following expectations: progress toward universal primary education; improvement in the quality of services throughout the system; and the production of a trained workforce that is responsive, in quantity and skills mix, to the demand for educated labor in the country's modernizing economy. At the same time, governmental decentralization is opening the way for regional and local governments (and through them, local communities) to take greater responsibility, financial and otherwise, for managing their own affairs, including the delivery of social services such as education.

For the education sector, these features in the country's political and economic landscape prompt a host of questions: Is the current education policy framework adequate for fulfilling the expectations placed on the sector? What resources are available to achieve the stated goals? Are these sufficient to meet the requirements? If not, how will the gap between resource availability and need be closed? What changes in the financing of education, in resource allocation across subsectors and schooling inputs, and in the arrangements for service delivery will help ensure that the education system develops over the long run in a fiscally viable and pedagogically sound manner? This report serves as a contribution to the continuing dialog on these strategic questions regarding the goals of and means for education sector development.[2]

2. The report thus complements two recently completed World Bank–sponsored studies—the public expenditure review on public spending in the social sectors and the study on higher education—as well as the many studies on education sponsored by the government and its other development partners.

Scope of the Report and its Audience

Ethiopia is a large and complex country and a report such as the present one must be selective in focus. The emphasis is on aspects of the education sector that are deemed especially relevant in the PRSP context—costs, finance, and service delivery and their impact on schooling outcomes, especially among the poor; and the economic and social benefits of investments in education. The report offers a sector-wide view on the allocation of public spending, the structure of costs, and the size and growth of the system's coverage across all levels of education; explores key aspects of service delivery in primary and secondary education, subsectors that constitute the bulk of the system and that serve large numbers of the poor; and takes stock of the market and nonmarket benefits of schooling. However, it does not discuss in detail technical and vocational training and education (TVET) and higher education. The exclusion of TVET was made for a practical reason: the subsector is rapidly evolving and the data required for a proper analysis could not be assembled to add value to what was already known. Higher education was excluded because a parallel study on the subsector was in process while this study was being prepared. Because of time and data constraints, the study does not cover nonformal education and early childhood education, nor does it address (except when relevant to the topics covered) such traditional educational issues as curriculum content, teacher training, pedagogical methods, language of instruction, and so on.

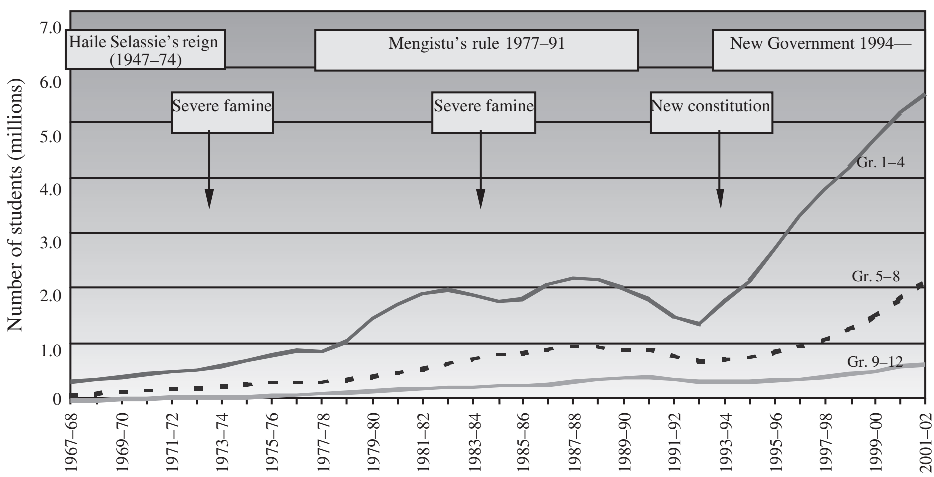
This report provides a snapshot of the education sector up to 2001–02 (and, on some dimensions, up to 2002–03). Its intent is to portray the selected aspects as accurately as possible so as to discover potentially important areas for policy development. Therefore, the report is deliberately diagnostic in orientation. This approach is important because the process of policy development and implementation must begin with a broadly shared understanding of the goals of sector development, the constraints on the sector, and the tradeoffs that might be required to overcome them. The report is thus aimed at a wide audience. In the first instance, it is directed toward Ethiopia's policymakers and managers in the education sector at all levels of government and toward education practitioners and researchers. It seeks to inform decision makers and analysts in other parts of the government as well, especially those with direct responsibility for designing the country's overall development strategy and for aligning public spending with that strategy. As a knowledge asset the study should be of interest to the government's development partners in education. This audience includes donors who are active in supporting educational development in Ethiopia; nongovernmental organizations that are active in providing various education services; teachers and other school personnel, in both the government and nongovernment sectors, who constitute the frontline agents for service delivery; parents and their children, the intended beneficiaries of education services; and the public at large for whom a strong education system is important for the country's overall economic and social wellbeing. All these partners play an indispensable role, and the report can help provide a factual basis to enrich discussions on the government's vision for sector development and its action plan to put that vision into effect.

Below we summarize the report's main findings. To economize on space, the presentation focuses on the country-wide highlights. Readers are invited to read the rest of the report for regional perspectives on the key sector development issues.

Remarkable Progress since 1993–94

Even casual observers of Ethiopia's education sector will marvel at the dramatic growth in enrollments throughout the system in recent years. Under the new government, aggregate enrollments in grades 1–12 rose at a steady pace of about 9 percent a year between 1992–93 and 2001–02; and in grades 1–4, the first cycle of primary schooling, they grew even faster: 15 percent a year. These trends are a remarkable achievement given the patterns of stagnation, reversals, and uneven growth in the past (Figure 1). By 2002–03, the education system had grown to about 8.6 million students in primary schools, and more than 0.6 million in secondary schools. Enrollments in technical and vocational training and education grew from fewer than 3,000 students in 1995–96 to an estimated 54,000 students in 2001–02. In postsecondary education, enrollments have also ballooned, from around 18,000 in 1990–91 to more than 48,000 in 2001–02.

Figure 1. Historically Unprecedented Growth in Primary School Enrollments since 1993–4



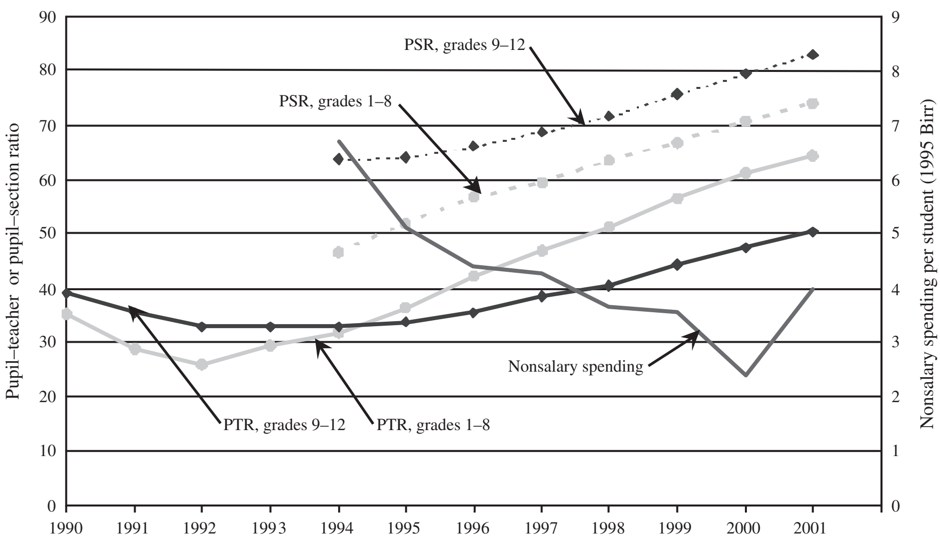
Note: Data include only students in regular programs in government and nongovernment schools.
Source: See figure 2.2.

The growth in enrollments shows up in a sustained increase in the gross enrollment ratio, a common indicator for measuring coverage, at all levels in the system. In primary education, it more than tripled between 1993–94 and 2001–02, from 20 to 62 percent. The ratio for secondary education rose from 8 to 12 percent in the same period, while that for higher education climbed from 0.5 percent to 1.7 percent. Despite these dramatic improvements, Ethiopia's gross enrollment ratios are still somewhat smaller than the corresponding averages for Sub-Saharan Africa.

Emerging Signs of Distress in the System

While undeniably impressive, the system's expansion has not been problem-free. The clearest distress signals are the deteriorating conditions in classrooms throughout most of the country. Since 1993–94, the pupil-teacher ratio, the pupil-section ratio (the number of pupils per section), and the real spending per student on nonsalary inputs have steadily worsened (Figure 2). In 2001–02, Ethiopia's pupil-teacher ratios of 65:1 in government primary schools and 52:1 in government secondary schools are among the highest in the world. Inevitably, section sizes at both levels have also risen to extremely high levels, averaging about 75 and 82 students per section, respectively.

Figure 2. Persistent Deterioration of Pedagogical Conditions in Schools since 1994



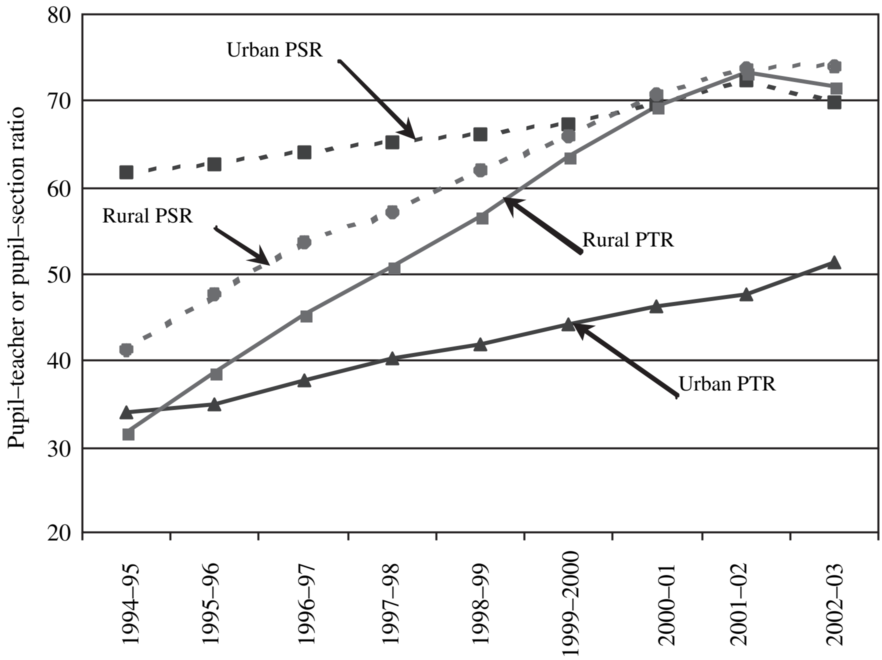
PTR Pupil–teacher ratio; PSR Pupil–section ratio.

Source: See figure 5.12.

Especially Desperate Conditions in Rural Primary Schools

As the system has expanded, conditions have worsened particularly rapidly in rural schools (Figure 3). The trends are such that by 2002–03 Ethiopia's school system found itself in the anomalous situation of having pupil-teacher ratios in rural schools that exceed those in urban schools, by an astonishing average of 60 percent in grades 1–4 and 50 percent in grades 5–8. Almost everywhere else in the world pupil-teacher ratios are typically smaller in rural areas because of their lower population densities. By contrast, classrooms in rural Ethiopia are as crowded as they are in urban areas. The combination of high pupil-teacher ratios and section sizes translates into much heavier teaching loads for teachers assigned to rural than to urban schools. In Oromiya, for example, the weekly load in rural schools averages 29 hours in grades 1–4 and 24 hours in grades 5–8, compared with the corresponding averages of 22 and 18 hours, respectively, in urban schools. These disparities imply that, in

Figure 3. Especially Rapid Deterioration of Pedagogical Conditions in Rural Schools since 1994



PTR Pupil–teacher ratio; PSR Pupil–section ratio.

Note: Because data are available separately for government and nongovernment schools only after 1997–98, the figure uses data for both sectors in all years. Data after 1997–98 indicate that the difference is small between the government-only series and that for both sectors.

Source: Based on data supplied by the Ministry of Education on number of pupils, teachers, and sections.

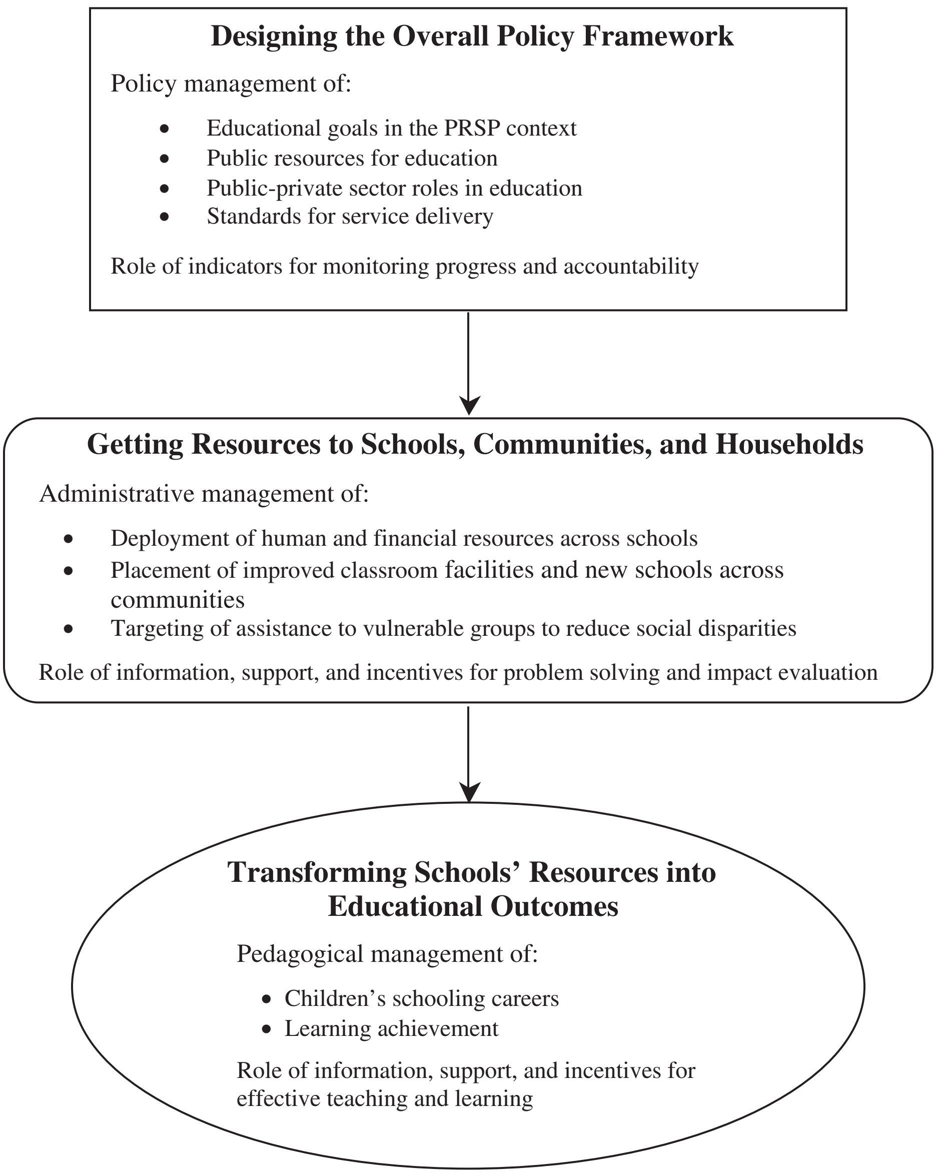
rural schools, there is almost no scope for specialized teaching; they also make rural teaching jobs even more unattractive than they already are, thus increasing the difficulty of rationalizing teacher deployment across schools.

A Framework for Considering the Challenges Ahead

Ethiopia is at a crossroads today. The main question is this: Is the model that framed the system's expansion since 1994 still valid to guide its future development? If the answer is in the negative, as the data increasingly appear to suggest, how then should we adapt the model to the conditions in Ethiopia today and in the years to come? Beyond this, we also need to address some searching questions on ways to improve management of the system, so that all available resources make their fullest contribution to the sector's development.

These are large and complex issues with no easy answers. One approach is to begin with a framework to conceptualize the way in which policies and actions work together to produce results on the ground. At risk of oversimplification, Figure 4 below shows three loci where the behavior of and decisions by various actors in the education sector make an important difference. The top layer corresponds to decision making by the federal and subnational governments, the impact of which permeates the system as a whole. It is the place where government sets overall sector goals and mobilizes the resources to reach them; where it defines standards for service delivery, and the roles of government and non-

Figure 4. A Conceptual Framework for Education Policy Development and System Management



Source: Authors' construction.

government providers; and where it makes explicit and agrees upon indicators for tracking overall progress as the basis for system-wide accountability.

The middle block in the figure reflects the idea that the impact of the broad parameters of educational policy is mediated, in the first instance, through activities to bring resources down to the level of schools, communities, and households. For the government, the figure lists three types of activities that are particularly pertinent, all having to do with good system administration: ensure that schools receive the resources, human and financial, required to deliver services; ensure that constraints on classroom facilities and the lack of schools are consistently and routinely addressed; and ensure that vulnerable population groups receive the assistance they need to participate in schooling. The impact of these activities can be enhanced by creating appropriate information flows and providing support and incentives for problem solving.

Finally, the figure shows a third locus—schools and classrooms—where policies are acted on to produce results on the ground. The actors here are school directors and teachers who must work with the resources at hand, material and otherwise, to manage the schooling careers of their charges and their acquisition of learning while at school. Once again, appropriate information flows and design of support and incentive structures can help strengthen performance.

The analysis in this report yields findings that are relevant for discussing the potential scope for improvement at all three levels of decision making described in the figure. They are summarized below using the figure's general structure. To move from diagnostic findings to a plan of action will obviously require consideration of a practical context. In this regard, the rapid move toward greater decentralization in Ethiopia is particularly pertinent, and some lessons from international experience on this score are distilled below to enrich the discussion of the implications for Ethiopia.

Designing the Overall Policy Framework

In a strategic policy framework, the key options for sector development and their fiscal implications are considered side-by-side rather than in isolation from each other. This approach is important because in a world of limited resources, tradeoffs are inevitable and will occur in one of two ways: through proactive choice or by default. When the tradeoffs occur by default, implicit choices are made that are likely to produce unforeseen and potentially adverse consequences. In the context of decentralization and increased social participation in the decisionmaking process, making the tradeoffs in an explicit and strategic fashion is probably the best way to balance the interests of competing groups in order to chart a course that benefits the country as a whole. The report's main findings on areas where hard decisions warrant attention are summarized below.

Rethink the Goals for Coverage and Differentiate Them for Urban and Rural Areas

As Ethiopia's SDPRP states, the education sector is expected to help reduce poverty by universalizing primary education and by producing a workforce capable of filling jobs requiring skilled labor. What do these goals mean in practice? Does universal primary education mean getting all children to complete eight years of primary schooling? Does producing skilled workers mean turning out as many graduates as the education system can put through the upper levels of the system?

Universalize four years of schooling as an immediate and practical priority. The 2004 World Bank Poverty Assessment for Ethiopia calculates that if all adults in the country had at least four years of primary education, the share of households living in poverty would drop by 18 percent. This sizable impact is consistent with the widespread agreement among policymakers and analysts that the core skills that primary education imparts—literacy and numeracy—can boost a child's life chances, even if he or she eventually earns a livelihood in agriculture. Because five years of primary schooling are generally considered a minimum for one to become permanently literate and numerate, a large number of countries made the commitment in the United Nations 2000 Declaration on the Millennium Development Goals (MDGs) to ensure that all children would be able to complete at least five years of primary schooling.

Ethiopia's education system has a 4-4-2-2 structure which at first sight makes it somewhat awkward to state a clear-cut goal for coverage: universalizing eight years of schooling is probably fiscally unviable even in the medium term, while universalizing only four years seems too modest in light of international experience. In practice, the issue is simple to resolve because coverage is still modest at present: only 60 percent in each age cohort ever enroll in grade 1, and barely 60 percent reach grade 4 (Table 1). Under these circumstances, implementation constraints alone would make universalizing eight years of schooling for the whole population an impractical goal in the short- or even medium-term.

Adapt the goals for coverage to conditions in urban and rural areas. Because initial conditions differ so widely across locality, setting different time-bound targets for urban and rural areas is a practical necessity. In urban areas the goal of universalizing eight years of

Table 1. Low Rates of Entry to Grade 1 and Survival to Grade 4, Especially in Rural Areas, despite Unambiguous Overall Improvement since 1993–94

		2001–02		
Indicator	**1993–94**	**Overall**	**Urban**	**Rural**
Cohort entry rate to grade 1[a/]	0.37	0.61	0.92	0.46
Composite cohort survival rates from grade 1				
To grade 4	0.52	0.59	0.77	0.55
To grade 8	0.39	0.36	0.80	0.20
To grade 12	0.15	0.08	—	—
Intercycle cohort transition rates				
Grades 4 & 5[b/]	0.94	0.88	1.07	0.79
Grades 8 & 9	0.84	0.91	—	—
Grades 10 & 11	0.86	0.33	—	—

— Data not available.
Note: See source tables for definitions of indicators.
a. Data for this indicator refer to 1995–96 and 2000–01, respectively.
b. The transition in urban areas in 2001–02 is slightly above 1.0, suggesting possible underlying data flaws.
Source: Tables 2.4 and 2.6; Figure 4.2.

primary schooling is well within reach (and is also consistent with the stronger demand for educated labor in such areas)—most children already enter grade 1 and the majority who survive past grade 2 eventually reach grade 8. The challenge here is to minimize the dropout rate between the first two grades where the problem is currently concentrated. In rural areas, by contrast, less than half the children in each age cohort enter grade 1, and of those who do, only 55 percent survive to grade 4 and only 19 percent, to grade 8. These patterns imply that universalizing even four years of primary education in rural areas will be a demanding goal, and that expansion beyond this minimum would need to be made in stages.

Allow labor market conditions to guide the pace of expansion beyond grade 4. As the economy matures, the demand for educated labor typically expands, making it increasingly appropriate and feasible to universalize eight or even more years of schooling. At issue is how fast to expand the education system. If the system grows too fast and produces more graduates qualified beyond the core skills of basic literacy and numeracy than can be absorbed into the prevailing job market, the investment would be wasted to the extent that graduates fail to find work appropriate to their level of training and so lose the expected return on their investment. With enough frustrated job seekers on the streets, the situation could easily escalate into serious social unrest. In part to minimize this risk and to institute a merit-based system for allocating scarce places in postprimary education, most governments in low-income countries use standardized examinations to regulate the flow of students through the system.

In Ethiopia the demand for educated labor has been growing, but only slowly. Nearly 80 percent of country's workforce is still in agriculture today, and more than 90 percent of the workers are either self-employed or used as unpaid family labor—features that put a limit on the economy's capacity to absorb large numbers of educated labor into modern sector jobs. Data from the most recent labor force in 1999 suggest, for example, that among recent graduates, the unemployment rate was about 25 percent among those attaining grades 5–8 or vocational/technical education and 44 percent among those attaining general secondary education. Only among university graduates was the unemployment rate at a modest 4 percent, and even this favorable situation may be short-lived unless jobs outside public administration (which have increased greatly in recent years because of decentralization) become the major source of employment in the future. These patterns underline the importance of aligning the expansion pace of postbasic education to labor market conditions.

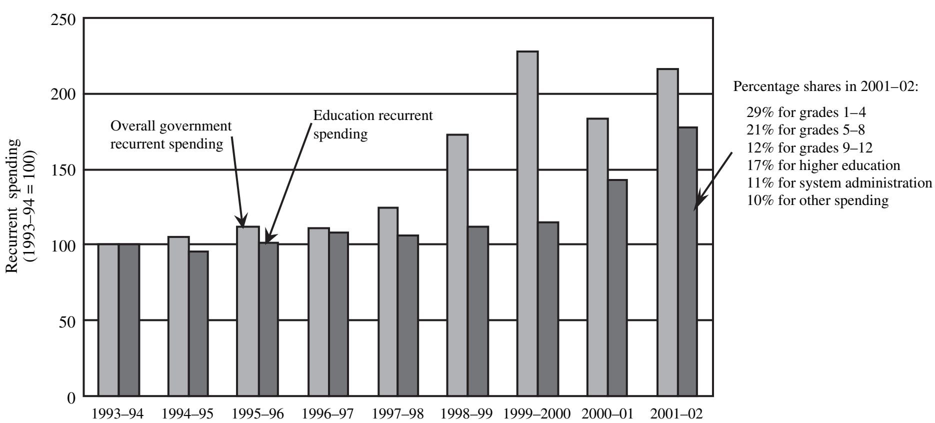
Improve the education system's responsiveness to labor market signals. Fostering a closer link between the education system and the labor market will require not only regular monitoring of the labor market to generate the relevant data, but also fairly flexible and responsive arrangements for service delivery. With regard to the latter, an important option is to enlarge the role of private service providers at postprimary levels. Because private providers serve clients who pay for most, if not all, of the cost of services and who are thus likely to insist on getting a reasonable return on their investment, such providers tend to respond more nimbly to labor market signals in designing their course offerings. This asset is especially important when the objective is to prepare graduates for employment rather than for further studies.

Beyond encouraging private providers, the government can also tighten the management of student flow through its own institutions, not least to counteract the tendency toward over-expansion in a highly subsidized sector. In recent years, the pressure on preparatory and higher education has risen sufficiently for the government to limit the number of places in grade 11 to 50,000 in 2002–03, compared with some 175,000 in 2000–01, and to divert the remaining grade 10 completers to programs in teacher training, and technical and vocational education and training. A selection mechanism also exists in grade 8 where students take standardized regional examinations. However, as Table 1 shows, today there is practically no selection at this point, as nearly 91 percent of the students eventually continue on to grade 9. This fact, coupled with the absence of a formal selection mechanism earlier than grade 8, may not matter much at present because nearly two-thirds of each cohort of first-graders eventually drop out much earlier. Yes, as basic education expands and survival rates improve, as they should, the need for a selection mechanism earlier than grade 8 is likely to present itself.

Prioritize Education, Especially Primary Education, in the Allocation of Public Spending

During most of the 1980s and 1990s, education was not systematically prioritized in the allocation of public spending. Since 2000, however, Ethiopia's government has been spending more on education, and aggregate public recurrent spending on education has now been restored to the 3 percent of GDP that prevailed in 1993–94 (Figure 5). Most of the increase has gone into administrative overheads and postsecondary levels of education, however, leading to a significant shift in the allocation of spending. Although this trend has not yet distorted the functional distribution of spending, the share of primary education—50 percent of the total in 2001–02—remains much less than the international benchmark of 67 percent under the Education For All Fast Track Initiative. This benchmark is itself

Figure 5. Recurrent Spending on Education Has Risen, but Share of Primary Education Still Needs to Grow



Note: The spending in both series are expressed in 1994–95 constant Birr, indexed to spending in 1993–94, the first year in the series; shares of spending in 2001–02 include amount spent on administrative overheads of federal ministry and regional bureaus, prorated by subsector in proportion to their share of nonadministrative spending.

Source: Figure 1.5 and table 3.8.

based on the pattern of spending in countries that have made good progress toward universalizing the completion of primary school (Bruns, Mingat, and Rakotomalala 2003).[3]

Continue to allocate more to education while ensuring wise use of the resources. Looking to the future, we see that the increased attention to education, both domestically and internationally, imply that the prospects of more resources for education are good. Yet, the magnitude of the increase will inevitably be constrained by the competition among sectors for the government's ultimately limited resources. Among low-income countries, very few have managed to sustain levels of recurrent spending on education beyond 4 or 5 percent of their GDP. Thus, if Ethiopia faces the same internal pressures as the governments in these other countries in managing revenue generation and resource allocation across sectors, the amount of additional resources that the sector can count on is likely to be limited even under the best of circumstances. If so, tradeoffs within the education sector will be unavoidable. To achieve the MDG of universal primary school completion and to cope with the ensuing pressures in subsequent grades, primary education up to grade 8 is likely to require a bigger share of recurrent spending in education than it currently receives. As subsequent discussion below reveals, it also will require action to improve the efficiency of resource use throughout the system.

Tap into households' willingness to spend on postprimary education. Because of likely constraints on the public purse, mobilizing household contribution for education needs to be part of an overall strategy for the education sector in Ethiopia. Mobilizing this contribution at postprimary levels will allow the government to prioritize primary education in the allocation of public spending. Cross-country data suggest that there is indeed scope for increased household spending on education. Such spending in Ethiopia is modest by Asian and Latin American standards, and smaller than the share of about 40 percent of total public and private spending in Madagascar and nearly 30 percent in Rwanda, two African countries for which recent data are available. Invariably, the higher shares of household contributions in these other countries can be explained by a much more developed privately financed system of secondary and higher education. In Ethiopia, private higher education has flourished in recent years. A continuation of this trend would be very helpful indeed in making it possible for the government to prioritize primary education in the allocation of public spending. In secondary education, the share of enrollments in privately financed institutions has been modest since the 1970s, averaging about 5 percent of the total. This level of participation is low even by low-income-country standards, so the scope for encouraging the growth of private secondary education should be quite promising.

Set Sustainable National Standards for Teacher Recruitment and School Construction

Giving more resources to primary education does not remove the need to make tradeoffs within the subsector itself. Indeed, if all children are to receive at least a primary education, questions arise about the options for scaling up. The distress signals already present in the system suggest that a simple replication of the current model of service delivery is unlikely to work. Indeed, expanding the system in a fiscally viable manner without compromising its ability to function well would probably require significant change in two key dimensions of service delivery—standards for teacher recruitment and school construction. A related issue pertains to a potential need to simplify the curriculum so as to reduce the use of specialized teaching and facilities, particularly in grades 5–8. In the context of decentralization, it is important to consider giving regional governments greater flexibility to adjust national standards in order to achieve their educational goals within the budget constraints they face.

Choose fiscally sustainable standards that benefit the system as a whole. Currently, the recruitment standards are as follows: teachers in grades 1–4 should have graduated from a teacher training institute (TTI; they should have had ten years of general schooling plus one year of teacher training); teachers in grades 5–8 should have graduated from a teacher training college (TTC; they should have had ten years of general schooling plus three years of training); and teachers in grades 9–12 should have received a university degree. In grades 1–4, almost all the teachers in government schools have the required certification, but in grades 5–8, only 26 percent do; in grades 9–12, the share is less than 18 percent. The remuneration of teachers averages about 6.8 times the per capita GDP for those teaching in grades 1–4, 8.0 times for those in grades 5–8, and 11.8 times for those in grades 9–12. With regard to construction standards, they are such that the cost can range up to $19,000 per primary school classroom.

Standards are obviously important: they help create a network of schools with common characteristics and are intended to enable schools to function well. Yet, if standards are set beyond what the country can afford (or mobilize through donor assistance), schools may meet the requirements in the areas explicitly specified, but only by cutting back in other areas; that eventually undermines their ability to provide good services. The result is a tradeoff by default. The fact that a poor tradeoff has occurred is reflected in the continual deterioration in schooling conditions since 1993–94 (shown earlier in Figure 2). Other telling signs are: (a) ubiquity of large and overcrowded schools (more than 20 percent of the government primary schools enroll more than 900 pupils, and about 25 percent of government secondary schools enroll more than 2,500 students); and (b) the pervasive shortages of certified teachers, especially beyond the first cycle of primary education. In regions such as Amhara and Oromiya, the teacher shortages have in recent years led the authorities to begin using or allowing the use of paraprofessional teachers (graduates of 10th or 12th grade without TTI or TTC certification) to fill the gaps.

More broadly, one implication of overly ambitious standards for teacher certification and construction is that fewer schools can be built and staffed for a given budget than would otherwise be the case. This tradeoff means that many villages in Ethiopia do without a government primary school and many children must travel long distances to get to a school. In some villages, the solution is offered by alternative basic education centers, which provide a simplified and shorter instructional program. These are set up with the help of nongovernmental organizations using locally recruited teachers (who have no formal certification and are paid much less than certified teachers) and facilities that cost substantially less than government schools to build. The use of paraprofessional teachers in government schools and the emergence of alternative basic education centers are creative solutions to very difficult circumstances and they make an obvious, if localized, contribution. It is important to note, however, that they cannot substitute for the reform of national recruitment and construction standards that are needed to benefit the entire system of government schools.

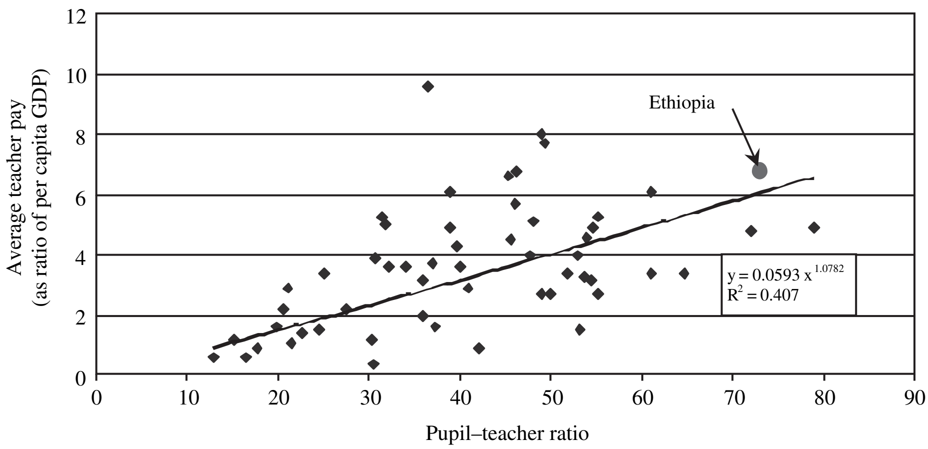
Use recruitment standards that leave room for improving other aspects of classroom conditions. Recruitment standards that are set without adequate attention to their financial implications can produce unintended consequences. In Ethiopia, the use of costly standards for teacher recruitment has reduced the resources available for other school inputs that are also essential for effective teaching and learning. A comparison of the pattern of resource allocation across school inputs in Ethiopia and other countries illustrates this point (Table 2). Expressed relative to the per capita GDP, the amount that Ethiopia spends per student in grades 1–8 is comparable to what the average low-income country spends. However, the composition of its spending differs strikingly from that in other countries. In the first cycle, Ethiopia's recurrent public spending per pupil is comparable to that in Asian and Eastern European countries. Ethiopia achieves the result by combining a much higher cost of teachers with a substantially less favorable pupil-teacher ratio and a significantly smaller share of spending on inputs other than teachers. In grades 5–8, Ethiopia's per pupil spending is comparable to the average for Latin American countries. Here again, the composition of spending reveals the same tradeoffs in which the higher cost of teachers is absorbed through a less favorable pupil-teacher ratio and fewer resources for inputs other than teachers. This is true even when compared with other African countries, where teacher remuneration as a multiple of per capita GDP typically exceeds that in other low-income countries—the composition of spending in Ethiopia reflects a substantial tradeoff against student-teacher ratios and allocations for inputs other than teachers, in favor of higher teacher costs. This fairly inevitable tradeoff between teacher remuneration and pupil-teacher ratios is suggested by the pattern in Figure 6, which is based on the experiences of a large cross-section of countries around 2000. With regard to Ethiopia's low level of spending on inputs other than teachers, the impact materializes in the form of a scarcity of pedagogical materials, including textbooks, throughout the system, as well as limited provision for teacher supervision and other support services for effective teaching.

Table 2. High Teacher Cost Leads to Adverse Tradeoff against Other School Inputs in Ethiopia

Country/region	Public spending per pupil[a/]	Average teacher wage[a/]	Pupil-Teacher ratio[b/]	Percentage of recurrent spending on inputs other than teachers[c/]
Ethiopia, 2001–02				
Grades 1–4	0.10	6.8	74.3	7.8
Grades 5–8	0.18	8.0	48.9	10.3
Regional averages, circa 2000				
Francophone Africa (20)	0.13	4.4	51.0	26.8
Anglophone Africa (13)	0.13	4.3	41.6	20.2
South & East Asia (10)	0.09	2.4	36.5	23.4
Latin America (4)	0.16	4.3	33.6	18.5
Eastern Europe & Central Asia (5)	0.11	1.2	18.2	31.3

a. Numbers in parentheses following each region's name refer to the number of countries on which the regional averages are based.
Source: Table 3.21.

Figure 6. Cross-Country Data Show a Predictable Tradeoff between Teacher Cost and the Pupil-Teacher Ratio



Note: Data for Ethiopia refer to grades 1–4.

Source: See figure 3.6.

Diversify the Options for Managing the Cost of Services

Broadly, the options fall into two categories: those that involve the use of alternative service delivery arrangements, and those that involve lower cost inputs or increased efficiency within the regular government sector. An important approach would be to make the menu of sensible options as large as possible, and empower and motivate involved decision makers to choose wisely among them.

Support alternative basic education centers as an option for service delivery. In Ethiopia such centers provide low-cost schooling covering the first four years of primary schooling. By compressing the program into three years, the services are particularly responsive to the needs of the large numbers of overage children currently seeking primary schooling. Although the centers have achieved reasonably good outcomes in terms of student learning, the majority operates without government funding as of this writing. As a result, they serve a limited clientele totaling perhaps 500,000 pupils in 2001–02, or about 8 percent of total enrollments in grades 1–4. If alternative basic education is to play a central role in universalizing primary schooling, the government will need to finance it and make the centers an integral part of the whole system rather than leave them as ad hoc experiments. In the process, it will be important to retain the features that make alternative basic education highly relevant in the first place, particularly in rural contexts: a flexible school day and academic calendar, use of teachers from the community, simple classroom facilities, proximity to children's homes, strong in-service teacher support, and reliance on community participation.

Accept flexible standards in order to lower costs in the formal school system. Because spending on teachers makes up the bulk of education costs, any strategy for cost management must consider ways to keep this cost item under control. A straightforward option is to reduce the pay structure, but in practice it is politically difficult and also largely irrelevant unless labor markets for the educated function poorly and teachers are somehow overpaid. If this were the case, one should find low attrition rates among teachers and high take-up rates of teaching jobs. Attrition is not a problem among TTI-certified teachers but it is serious among those with TTC diplomas and university degrees (those expected to fill teaching jobs in grades 5–8 and grades 9–12). If anything, the indications are that teachers with such qualifications are leaving the profession for more attractive nonteaching jobs; and among fresh graduates trained to be teachers, significant numbers do not even turn up at their posts, particularly in the more remote regions.

A second and more promising option is to accept greater flexibility in teacher recruitment standards, for example, by allowing new teachers to be recruited at lower levels of formal certification. This does not mean filling teaching posts with the clearly unqualified candidates, nor does it mean that once recruited, the teachers remain stuck in their careers. Rather, the idea is to lower the floor for entry while encouraging teachers to upgrade their qualification over time as part of a long-term career plan. As indicated above, recruitment of paraprofessional teachers is already happening to some extent in some regions. Such teachers may have completed 10th or 12th grade without certification from a teacher training institute or college, and they may typically receive a pay that is perhaps only half as high as that of a certified teacher. Even so, recent processing of recruitment in Oromiya, for example, suggests that in some localities there may be as many as 20 qualified applicants for each available position. Recruiting at lower levels of certification is admittedly not ideal because of possible adverse effects on the quality of services. Yet it may be the only way to manage tradeoffs within a limited budget that will achieve a balanced and *pedagogically effective* combination of school inputs, one characterized not just by acceptable levels of teacher certification, but also by reasonable student-teacher ratios and adequate availability of books and other pedagogical materials.

Reduce subject specialization to make better use of teacher time. Although the present report did not concern itself with the details of the curriculum content, the impact of specialized teaching after grade 4, possibly exacerbated by constraints on classroom facilities, can be deduced from the pattern of teachers' use of time: whereas weekly teaching loads in grades 1–4 average 24 hours, they fall to 17 hours for teachers in grades 5–8, and 15 hours, for those in grades 9–12. Comparison with the practice in other countries suggests that there is probably some scope for improving the management of teacher time in Ethiopia (Table 3). Exploring this potential is important because differences in teaching loads make a big difference to the cost of service delivery. Our analysis suggests that, all else being the same, the impact of the difference in teaching loads in grades 1–4 and grades 5–8 is to raise unit spending in the second cycle by an estimated 40 percent. This simulation implies that unless teachers in grades 5–8 are used as fully as they are in grades 1–4, the fiscal requirements of a large-scale expansion of the system after grade 4 will probably be hard to absorb.

Include lower cost models among the options for classroom construction. The Ministry of Education recently commissioned two studies to look into the options for more affordable designs. One study found that construction costs could be reduced to between $4,400 to $5,900 per classroom depending on choice of materials and design. Costs are naturally higher in the more remote areas, but the second study found that even after taking this factor into account, existing construction costs could be reduced by about a third. For

Table 3. Scope Exists for Increasing the Efficiency of Time Use by Teachers beyond Grade 4

	Teachers' weekly teaching hours		
Country/country group	Primary[a/]	Lower secondary[b/]	Upper secondary
Ethiopia	**24.0**	**17.2**	**15.0**
OECD Mean (27 countries)	**21.2**	**19.4**	—
Minimum	15.2	15.0	—
Maximum	31.6	31.3	—
WEI Mean (17 countries)	**21.6**	**20.0**	**19.1**
Minimum	17.6	12.9	12.9
Maximum	29.4	29.4	24.5

—Data not available.
OECD Organization for Economic Cooperation and Development; WEI World Education Indicators (refers to a collaborative project between the OECD and middle-income countries to collect consistent data on education).
a. Grades 1–4 in Ethiopia; typically grades 1–5 or 6 in the other countries.
b. More or less equivalent to grades 5–8 in Ethiopia.
Source: See Table 3.22.

comparison, the calculations in the Education For All Fast Track Initiative use a rate of \$8,000 per classroom, a benchmark based on cross-country experience in Africa. The scope for reducing construction costs in Ethiopia thus appears to be substantial. While a \$6,000 classroom may not be as good as a \$20,000 classroom, choosing the latter standard effectively means that for a given budget less than a third as many new classrooms would be built.

Focus on Key Indicators to Monitor Progress

In designing the overall policy framework, it is not enough simply to define goals and make tradeoffs; it is also critical to track progress toward the intended goals. This activity also generates the feedback that is so critical for adjusting policies as they are implemented. As mentioned above, three goals in education are pertinent in the PRSP context: universal primary education, improvement in the quality of services, and production of a skilled workforce. Below we summarize the report's findings regarding monitoring of the first goal. With regard to the second goal, we note in passing that in 2000 the government completed a national baseline assessment of student achievement in grades 4 and 8 and has just repeated the exercise in 2004. Regular followup of this nature, including possible participation in international student assessments in the future, is a good way to track progress on the second goal. With regard to the production of a skilled workforce, it is particularly important to track the transition from school to work among graduates of those courses of study that are especially expensive for the government to provide (for example, TVET and higher education). While a systematic and routine tracking of this transition does not appear to be in place at present, the gap can be bridged by exploring collaboration with the Central Statistical Authority to generate the required data through its regular surveys (for example, by adapting and adding appropriate questions in the survey instruments).

Keep the set of indicators for primary education small and relevant. In the past, most countries have used cross-sectional measures such as the gross and net enrollment ratios to measure progress, in part because these indicators are easy to compute. While appropriate for some aspects of education planning, they are deeply flawed for tracking the country's progress toward ensuring that all children have access to a full cycle of primary schooling. This is particularly true in the context of Ethiopia where the system is still catering to a large backlog of overage children. Increasingly, countries are instead using the primary school completion rate (typically at grade 5 or 6) as the relevant measure of success. Because this indicator reflects underlying patterns of access and continuation in school, two other measures, the entry rate to grade 1 and survival rates to subsequent grades, are also included as part of the package. Furthermore, repetition rates are typically reported as well, for two reasons: First, an education system characterized by high rates of repetition costs more to operate. Second, high repetition rates point to possible problems in managing student flow, which, if left unattended, are likely to make it harder to improve completion rates.

Measure the indicators correctly. Assuming the foregoing indicators are to be tracked, it is important to agree on the methods and sources of data for making the estimates. Trade-offs are inevitable but important considerations include the following: (a) use of cohort rather than cross-sectional measures (for the reasons elaborated in the report); (b) reliance on data generated by existing mechanisms to avoid overburdening the available capacity for data collection; (c) use of simple calculations that keep tedious data manipulation to a minimum. Table 4 shows the indicators that are likely to meet these criteria. Cohort entry rates require survey data that include the educational status of children. The fact that the data pertain to a sample rather than to the entire population is admittedly a flaw, but it cannot be avoided because of the nature of the desired statistic. The high frequency of household surveys in Ethiopia should make it possible to cross-check the estimates, all of which can be generated at relatively low cost by consistently adding to the survey questionnaires a question for each household member aged 5 and above on whether or not they have ever been enrolled in school (and if so, in what type of school). The other indicators can be estimated using data generated from the Ministry of Education's annual school census. While

Table 4. Possible Indicators for Monitoring Progress in Primary Education in Ethiopia

Indicator	Definition/comment	Source of data
Cohort entry rate to grade 1	Percentage of age cohort ever enrolled	National household survey
Composite cohort survival rate, grades 1–5	Percentage of entrants who reach grade 5	Annual school censuses for data on enrollments and repeaters by grade
Composite cohort completion rate, grade 5	Product of the cohort entry and composite cohort survival rate to grade 5	Computed
Repetition rate, grades 1–5	Repeaters (defined to include "readmitted" students) in grades 1–5 in year Y divided by enrollments in grades 1–5 in year Y–1.	Annual school censuses; verified by surveys as available

Source: Table 2.10, based on authors' construction; see text for further elaboration of the indicators.

accuracy in the census data, particularly with regard to repetition status, continues to be an issue, these data pertain to the whole population of students; they can be further cross-checked by including, as is already done in some household surveys in Ethiopia, two additional questions in the survey instruments: (a) Are you currently enrolled, and if so, in what grade? and (b) Were you enrolled last school year, and if so, in what grade?

Getting Resources to Schools, Communities, and Households

This activity corresponds to the second block of management responsibility in the conceptual framework presented earlier. It can be thought of as a package of interventions whose aim is to improve services to the groups that currently lag behind in school participation. This is important because the country's overall progress in education will depend on how fast these groups are brought into the system.

Pay Special Attention to the Needs of Rural Populations

Table 5 summarizes the differences in primary school participation across three commonly defined population groups: girls and boys, children in urban and rural areas, and children from rich and poor households. The indices shown in the table are a composite of various indicators of school participation explained in the report. Among the three sets of groups compared, the gap is widest between children in urban and rural areas: the index for rural children is, on average, only 31 percent that of their urban counterparts. More detailed analysis reveals that whereas 90 percent of urban children ever enroll in grade 1, the share is only 45 percent among rural children. Once in school, rural children survive to grade 4 at about 72 percent the rate of urban children, but their survival rate to grade 8 is only 25 percent as high. Overall, these results suggest that improving primary schooling outcomes in Ethiopia and reducing socioeconomic disparities in the higher levels will require a concerted effort to address the constraints in rural areas. This does not mean that other population groups should be neglected, but it does mean that attention to the needs of rural localities will be paramount.

Table 5. Urban-Rural Disparities in Primary School Participation are Especially Wide in Ethiopia

	Index of parity in primary school participation			
Country/region	Girls (Boys = 1.00)	Rural areas (Urban = 1.0)	Poorest quintile (Richest = 1.0)	Average across all three sets of comparisons
Ethiopía	0.77	0.31	0.69	0.59
Sub-Saharan Africa	0.83	0.63	0.50	0.65

Note: Indices of parity between the groups compared are based on the averages of the following cross-sectional indicators: gross enrollment ratio for grades 1–6; nonrepeaters in grades 1 and 6 relative to the populations ages 7 and 12, respectively.
Source: Table 4.6.

Managers in the education system can influence progress toward the country's goals in basic education through their management of the supply- and demand-side factors that affect schooling behavior. Below we summarize the report's findings in this regard. Note that although we discuss supply- and demand-side issues separately to facilitate the presentation, the distinction is not strict in practice because of interactive effects.

Act on the Supply of Services

The report identifies three aspects of the supply of services that warrant attention: (a) the availability and accessibility of schools; consistency in teacher deployment across schools; and (c) completeness of the instructional program offered in schools. With regard to teacher deployment, it is important to note that in Ethiopia, very little is spent on non-teacher inputs, and the bulk of public spending on education reaches schools in the form of teachers. Focusing on teacher deployment is therefore a good way to ensure that resources are equitably allocated at the facility level.

Improve the availability and accessibility of schools in rural areas. According to published tabulations from the 2001 Child Labor Force Survey, about one in seven Ethiopian youths (excluding those who were too young to enroll) cited the lack of a school as the reason why they were not enrolled. The problem of distance, especially among rural children, is illustrated in Table 6, based on data from the 2000 Welfare Monitoring Survey. Fully a third of the rural children in the survey lived at least five kilometers from the nearest primary school. Multivariate analysis of the data indicates that when differences across households are controlled for, each additional kilometer of distance from the nearest primary school reduces school registration rates by two to three percentage points, up to distances of 12 to 15 kilometers. In other words, reducing the distance to school from 10 kilometers to 0 (that is, to within the neighborhood) could raise registration rates by 20 to 30 percentage points—a substantial increase by any measure.

It is important to note, however, that distance is far from being the only determinant of school registration: among children in rural areas with a school in the neighborhood,

Table 6. Primary Schools are Still Too Inaccessible for Many Children in Rural Ethiopia

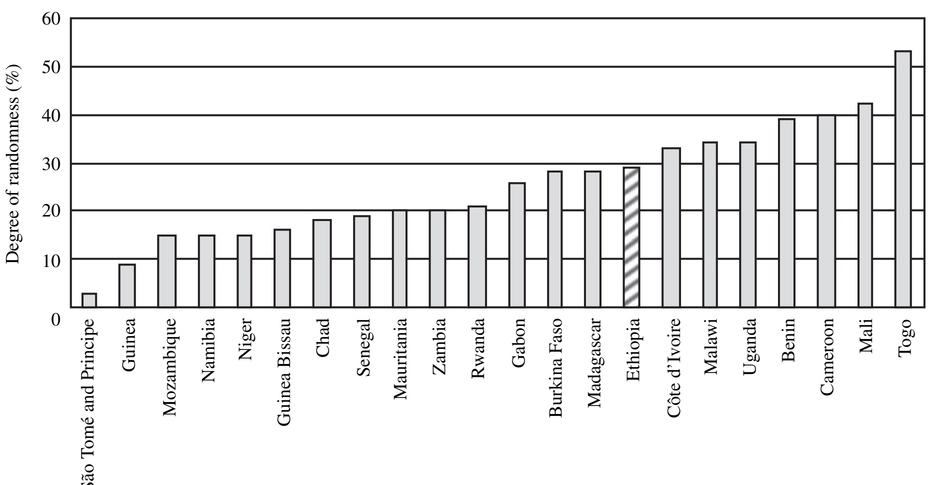
	Distance from home to nearest primary school				
Locality	**0**	**1–2 km.**	**3–4 km.**	**5 km. +**	**All**
Percentage of all sample children					
Urban	47.4	45.3	6.2	1.1	100
Rural	15.4	28.1	27.8	33.3	100
Total	19.6	30.4	24.9	25.1	100
Percentage of children registered for school					
Urban	85.5	83.1	78.9	71.0	84.0
Rural	43.6	38.8	32.6	19.8	32.4
Total	57.0	47.4	34.1	20.0	41.6

Source: See Table 4.9.

less than 44 percent registered for school; in urban areas, the percentage is much higher—86 percent. The fact that participation is still not universal suggests that even in such areas, factors other than distance continue to influence schooling decisions. These results imply that if school attendance is to be improved, other constraints would need to be addressed. The multivariate analysis suggests that the quality of learning environment also matters: when taken together, the variables associated with this aspect of supply explain a large fraction of the differences in enrollment rates across localities that are not explained by differences in the characteristics of the households.

Deploy teachers across schools more consistently in relation to size of enrollments. Improving the quality of the learning environment requires action on many fronts. One is to ensure that teachers are available in adequate numbers relative to the number of students in the school. Because pupil-teacher ratios are so high on average in Ethiopia, all schools suffer from chronic shortages of teachers. The situation is much worse in some schools than in others, however, because of the inconsistency in teacher deployment across schools. Among government primary schools enrolling about 1,000 pupils, for example, the number of teachers could range from less than 5 to more than 30. Across government primary schools, an estimated 28 percent of the variation in the number of teachers on staff is accounted for by factors other than the size of enrollments; across government secondary schools, the corresponding share is 30 percent. Figure 7 shows cross-country results that place Ethiopia among African countries having a fairly highly degree of randomness in the allocation of

Figure 7. Allocation of Teachers across Government Primary Schools is Highly Random in Ethiopia



Note: The degree of randomness is computed as 1 minus the R^2 value of regression equations relating number of teachers assigned to teach the indicated grades to number of pupils in those grades, with schools as the unit of observation. The index has a 0–1 range, with higher values indicating greater inconsistency in the deployment of teachers across schools. Data refer to government schools in all countries.

Source: Figure 5.6.

teachers across primary schools. More detailed analysis shows that the relation between number of teachers and number of pupils is even weaker in grades 1–4. More consistent allocation of teachers across schools is clearly a goal that better administrative management of the system can and should strive to achieve.

Encourage schools progressively to offer complete instructional programs. Another factor on the supply side that affects the quality of services is the completeness of the instructional program offered by schools. Where instructional programs are incomplete, some students drop out sooner than desired or repeat the highest grade offered simply because they have nowhere else to go in the system. In Ethiopia, only a fifth of government primary schools offer instruction up to grade 8 (and these are generally the oldest schools), while just over 31 percent stop after grade 6, and 34 percent, after grade 4 (Table 7). Rural schools are more likely than those in urban areas to offer an incomplete instructional program. The legacy of the previous 6-4-4 structure of education system (which was replaced by the current 4-4-2-2 structure in 1994) is evident in the large share of schools that stop at grade 6. Most of these schools were created around 1980 and appear not to have evolved to match the new structure of the system. Schools that stop at grade 4 were created, on average, around 1987, and most also appear not to have developed beyond the scope of their initial instructional program. Schools that offer fewer than the first four grades make up less than 8 percent of Ethiopia's primary schools. Nearly 69 percent of them are new in the sense that they have not been around long enough to fill out the complete instructional menu. These schools have, on average, the highest pupil-teacher ratios than other schools, suggesting that staffing constraints may be one factor standing in the way of their development. Part of the task of strengthening the administrative

Table 7. Incompleteness of Instructional Program Characterizes Many Rural Primary Schools

	Highest grade of instruction offered						
Indicator/locality	Grade 3 or lower	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	All schools
Percentage distribution of government schools[a/]	7.6	34.0	4.4	31.4	2.5	20.1	100.0
In urban areas	4.8	11.9	1.8	16.4	2.7	62.4	100.0
In rural areas	8.0	37.0	4.7	33.4	2.5	14.3	100.0
Percentage distribution of new first-graders[b/]	5.4	23.5	3.7	32.5	3.1	31.8	100.0
Average year schools were created	1997	1987	1985	1980	1978	1971	1982
Percentage of the schools that are new[c/]	68.8	10.7	11.1	2.2	5.4	3.8	11.0
Average pupil-teacher ratio	84.5	73.6	82.4	79.1	77.8	72.5	76.3

a. Based on data for 10,919 schools, of which 1,303 are in urban areas, and 9,616 are in rural areas.
b. The number of new entrants totaled 1,599,110 for Ethiopia as a whole, excluding Somali.
c. Schools created no more than n years ago, where n is the highest grade of instruction offered by the school.
Source: See Table 5.4.

management of the system is to ensure that constraints at the school level, whether in staff or classroom facilities, are addressed so that a complete instructional program can be offered. Obviously, clarifying the number of years of schooling that are to be universalized will affect what is considered a full cycle of primary school instruction.

Address Demand-side Constraints

The demand-side constraints on school participation are many. They include household-level factors such as the affordability of schooling relative to household incomes, the opportunity cost of children's time, and the value of schooling perceived by parents; individual-level factors such as the child's personal characteristics (for example, gender and orphanhood status); and community-level variables such as language. While many of these variables are impervious to policy interventions, particularly in the short run, documenting their impact helps planners understand the dependence of educational progress on success in solving problems in other sectors, and identify possible interventions and target groups for special attention.

Reduce the direct costs of schooling for children from poor families. In Ethiopia schooling is tuition-free but families incur other fees and expenses to enroll their children. Among youths surveyed in 2001, about 13 percent cited affordability as the reason why they were not in school. The analysis shows that the direct costs of schooling can indeed be significant: households spent an estimated total of 387.8 million Birr on education services in 1999–2000 (nearly 30 percent of the government's recurrent spending on education that year), and slightly more than half of the total was for primary schooling. Across households, the direct costs of primary schooling weigh more heavily on the budgets of the poorest households than on those of their richer neighbors, not just because the per child outlay is a larger share of household income, but also because poorer families tend to be larger (Table 8). The impli-

Table 8. The Direct Cost of Primary Schooling Can Be Significant for the Poorest Families

	Annual education outlay per child in primary school[a/] (Birr, unless otherwise indicated)			
Type of School	Poorest quartile	2	3	Richest quartile
Government schools	21.9	27	36.5	57.2
Nongovernment school	37.4	56.9	64.1	340.9
Weighted average	22.6	28.1	38.2	80.8
As a percentage of consumption expenditure per adult equivalent	3.3	2.6	2.5	2.4
Memorandum:				
Annual average consumption expenditure per equivalent adult	688	1,095	1,555	3,366

a. Includes expenditure on fees, books, school supplies, and other education-related items. The estimates are based on data for the 8,112 households in the sample that have children enrolled only in primary education in the indicated type of school. The estimates are underestimated to the extent that spending on evening programs is excluded.
Source: Table 3.20.

cation is that in mobilizing private household resources for education, it is important for the government to avoid increasing the already large burden on poor households. Indeed, if private funding for postprimary education is successfully mobilized, the result should be to free up public funds for primary schooling, perhaps even to eliminate the cost that families still face to enroll a child in primary school. In countries such as Kenya, Lesotho, Malawi, and Uganda, concern that costs may be keeping children from school has already led the governments in these countries to implement free primary education in the 1990s as part of their poverty reduction strategies (Avenstrup 2004); more recently countries such as Madagascar, Rwanda, and Tanzania, to name a few, have joined the list.

The impact of the direct costs of schooling can be expected to interact with poverty. Analysis of household data shows that after controlling for supply-side conditions and other household and personal characteristics, moving children from the poorest quintile to the richest quintile would, on average, raise attendance rates by 6 to 10 percentage points. This is a modest increase, but it is important to note that the effect of income is much stronger among children who live within two kilometers of the nearest primary school: moving from the poorest to just the next-poorest quintile would boost attendance rates by nearly 8 percentage points. The result suggests that income matters and that its influence is likely to grow as the direct costs of attending school decline. The implication for policy development is that additional effort beyond making schools more accessible and free of charge may be needed to encourage the poorest families to enroll their children.

Offer additional help where needed to reduce the opportunity costs of schooling. When a child's presence in school conflicts with participation in work activities—whether at home, on the family farm, or in the labor market—families are said to incur an opportunity cost in enrolling a child at school. The data suggest that more than half of rural Ethiopian boys and nearly a third of rural girls report having worked in a range of activities that might constitute a "job." Children who work are generally less likely to attend school, but it appears that not all work is incompatible with schooling. This interpretation is consistent with the modest size of the impact of children's work on schooling reflected in the multivariate analyses: all else being unchanged, a 10 percent increase in the availability of adult labor in the household reduces child participation in work by 1.8 percentage points, and raises school attendance rates by 0.6 to 0.8 of 1 percentage point. In urban areas, the estimates suggest that the addition of each young child in the household (which increases the demand for childcare by older siblings, especially sisters) reduces by 4 percentage points the school participation rate of girls, while increasing their participation in unpaid domestic work by a comparable amount.

Help parents and communities better appreciate the value of schooling. In a country where schooling rates are as low as in Ethiopia, a plausible barrier to the schooling of children may simply be the fact that parents themselves have not been to schools and have no idea what schools can do for their children. Descriptive information from the Welfare Monitoring Surveys reveals, for example, that among rural households who were asked why they have not sent their children to the nearest primary school, a higher percentage answered "no experience" or "have no need of it" than "too expensive" or "too far" or "poor quality." The multivariate analysis shows that a child's chances of being enrolled is influenced by the percentage of household heads in a locality (excluding the child's own household head) who are literate, even after controlling for such factors as household poverty, distance from school, and whether or not the child's own household head is literate. The fact that the impact of parental literacy diminishes sharply with the inclusion of community-level literacy rates in the regression analysis suggests that beliefs about importance of schooling may be formed at the community-level, and that exposing communities to the potential benefits of schooling may be a more useful approach in the short run for enhancing school participation than targeting each school-aged child's parents individually.

Remove barriers to school participation posed by language, gender, and orphanhood. The available data also allow an assessment of the impact of these potentially important demand-side factors. Substantial differences in school participation exist across language groups, particularly in rural areas. In multivariate analysis, these gaps are diminished only modestly after controlling for the influence of a full range of regional and household factors and that of community-specific effects. The results lend themselves to the interpretation that it is language per se, and not just associated differences in culture and prosperity, that cause registration rates to differ. The government introduced teaching in the child's mother tongue in its 1994 education policy, an action entirely consistent with the policy's intention to facilitate expansion of primary school participation throughout the country.

With regard to girls and orphans, the patterns are consistent with what might be expected. Gender gaps are primarily a rural phenomenon, and appear to be region-specific, implying that efforts to increase school participation by girls will require a region-by-region approach. For orphans, the multivariate analysis shows that after controlling for a variety of household, community, and regional characteristics, children who have lost one parent are 5 to 6 percentage points less likely to attend school than nonorphans, and that the effect is twice as great for children who have lost both parents. The fact that orphans are at a disadvantage is evident from the regression results showing such children less likely to enroll in school than the biological children of the household head with whom they live.

Transforming Resources in Schools into Educational Outcomes

The outcomes of interest are the children's schooling careers—as reflected in entry, survival, and repetition rates—and their learning achievement. In both domains, good results will require teachers and school directors to manage the pedagogical process effectively. The decisions made by both school and parents are interconnected. While teachers and school directors may have limited influence over entry rates, they are directly responsible for year-end decisions on whether a child will be promoted or asked to repeat a grade. It is those decisions that in turn provide parents the information they need, along with other considerations, to choose whether or not to keep their child enrolled in the next school year. A child's academic progress influences to a large degree the decisions on promotion and grade repetition. In light of this, and because student learning is valued for its own sake, successful delivery of education services must be reflected in progressive improvements in the level of student achievement.

Make it a Key Goal to Raise Student Achievement

As indicated earlier, the Ministry of Education embarked in 2000 on the first national baseline assessment of grade 4 and grade 8 student achievement and has just completed a followup assessment in 2004 (data from which are not yet available at this writing). In the 2000 assessment, about 10,500 fourth-graders were tested in Reading (in the language of instruction), English, Mathematics, and Environmental Science; and some 5,500 eighth-graders were tested in English, Mathematics, Chemistry, and Biology. The average percentage of correct answers for all the subjects combined was 48 percent in the grade 4 sample; and 41 percent in the grade 8 sample. Given that the test items were chosen from a range of key topics in the curriculum for the grade tested as well as that for the previous grade, these scores indicate that a large number of students were not achieving the curriculum objectives.

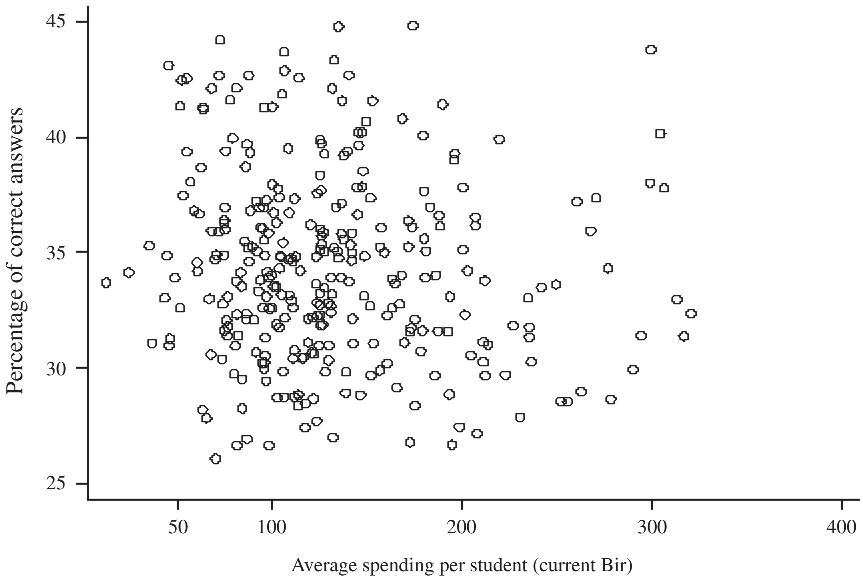
A key challenge for pedagogical management is therefore to improve upon these baseline scores. Finding the right interventions will not be easy. The national baseline assessment evaluated the importance of such factors as school infrastructure; school organization and management practices; teacher characteristics and practices; and the availability of instructional materials and equipment. In both grades 4 and 8, the study confirmed the importance of textbooks and the use of radio for supplemental instruction, findings that are consistent with those reported in many similar studies. In grade 8, while schools differed in the share of teachers who graduated from a teacher training college or higher levels of training, the study found that this variable had no impact on student achievement. By contrast, the study found that process variables (those that reflect attitudes and behaviors) were important, including how well teachers prepared their lessons, how much the director focused on school matters, and the extent to which students engaged in homework.

Tighten the Relation between School Inputs and Student Learning

In an effort to understand the avenues for promoting student learning, the present study supplemented the national baseline assessment with an ad hoc analysis of the correlates of grade 8 examination scores in Oromiya Region, based on data for 2001–02 specially assembled for 314 of the region's total of just over 1,000 primary schools with students in grade 8. Analysis of these data found that differences across schools in some of the tangible factors often considered important for school quality—especially teacher certification—accounted for very little of the differences in performance across students or schools. Although this finding appears puzzling, a moment's reflection reveals why it might not be so strange. While the tangible aspects of schools define the infrastructure for teaching and learning, they alone cannot yield good results unless the human agents put in charge of them are properly motivated, supported, and held accountable for well-defined and measurable outcomes. Indeed, it is conceivable that even the best-equipped and staffed school would fail in a poor management environment.

The importance of good pedagogical management can hardly be exaggerated. In Figure 8 below, the tangible factors were converted into monetary terms and the results used to relate spending per student to examination score across schools. The figure shows virtually no link between the two variables: schools with relatively high levels of recurrent spending were just as likely to outperform as lag behind less well-endowed schools. This pattern, which is familiar from similar analyses in other countries, including developed ones, confirms the weak relation between school inputs and learning outcomes. The absence of a link does not imply that money is irrelevant; for example, money to buy more books would be a help given their consistently demonstrated impact on learning in many diverse settings. What it does say is that money by itself is insufficient to achieve good results.

Figure 8. An Example of the Weak Link between Spending per Primary Pupil and Examination Scores



Note: Data are for a sample of some 300 primary schools in the Oromiya region, each of which is represented by a circle in the figure. The mean score refers to the average percentage of correct answers of students in each school for eight subjects.

Source: Figure 5.11.

The national baseline assessment indicates that certain behaviors on the part of teachers, school directors, and students are particularly important. The real issue from a systemic perspective is to discover the underlying support and incentive structures that motivate teachers and school directors to adopt these and other helpful behaviors and practices.

Taking Advantage of Decentralization to Get Results

Ethiopia is currently undergoing a far-reaching decentralization of the structure of government. Budgets are allocated to the regions in block grants, and the regions in turn are expected to make block grants to the *woreda* (lower level) governments. In the new governance landscape, these subnational governments are directly responsible for service delivery in primary and secondary education (as well as some other subsectors). For them, two of the issues discussed above are immediately pertinent: (a) the weak discipline in the allocation of resources across schools, so that human and financial resources are ineffectively channeled to the front lines (i.e., the schools); and (b) the apparent disconnection between resources and learning outcomes. The third aspect of management—making tradeoffs among alternative goals and means—will become increasingly relevant as power, finances, and responsibilities are transferred to the regional authorities.

Learn from International and Domestic Experience

Even though the process of decentralization is still at an early stage, Ethiopia might take note of the lessons emerging from the experience in countries further along in process, and might learn from its own implementation efforts as these mature. Winkler and Gershberg (2003) distill the following lessons, based mostly on experiences in Latin America and Eastern Europe:

- "Efficiency and effectiveness are most likely to improve under decentralization when service providers—schools, local governments, or regional governments—are held *accountable for results.*
- Accountability requires *clear delineation of authority and responsibility* and transparent and *understandable information* on results (both educational and financial).
- Decentralization of real decision making power to schools or school councils can significantly increase *parental participation* in the school, and high levels of parental and community participation are associated with improved school performance.
- Decentralization of education to sub-national governments does not in and of itself empower parents and improve *school performance.* Further decentralization to schools (school councils or school boards) or local communities does empower parents and can improve school performance.
- For decentralization to schools to be successful, *principals* must acquire new skills in leadership and management—financial, of teachers, and with the community.
- The *design of financial transfers* to sub-national governments or schools has powerful effects on both efficiency and equity.
- Decentralization requires that national and/or regional *ministries of education* be restructured; failure to restructure ministries is a serious obstacle to realizing the benefits of decentralization.
- The decentralization of *teacher management* is critical to creating accountability and realizing the potential benefits of decentralization.
- National education ministries frequently resist decentralization on the grounds that sub-national governments, communities, and/or schools lack the *capacity to manage* education. In practice, this is seldom true.
- Real decentralization is a long, evolutionary process."

Some of the foregoing ideas are already being made concrete in the Ethiopian context. For example, in 2002 the Ministry of Education issued a set of "Guidelines for Organization of Educational Management, Community Participation and Educational Finance" to clarify roles and responsibilities at all levels of management in the education system, as well as to give explicit recognition to the importance of community participation and parental involvement in school-based management. Identifying the most critical elements in these guidelines, putting them into practice, and evaluating the impacts of alternative arrangements are important tasks that warrant attention in the years to come. If carried out systematically and routinely, they will provide lessons from Ethiopia's own implementation of decentralization in the sector.

Mobilize and Disseminate Information to Enhance Accountability for Results

As education is decentralized in Ethiopia, the challenges of ensuring accountability for results will increasingly come to the fore. The task is difficult because many actors are involved and the outcomes are typically multidimensional, but the difficulty can be reduced by creating the right kinds of information flow. In the first instance, the availability of appropriate information at the level of schools can help stimulate a community's interest in ensuring that its schools get a fair share of the public resources for education. In Uganda, for example, a large-scale public dissemination of information on grants for schooling gave schools and parents the information they needed to monitor the grants. Over the space of just six years, the leakage of funds fell from 80 to 20 percent, and schools were able to use the resources now reaching them to purchase textbooks and other pedagogical inputs (World Bank 2004a).

Of course, information flow can also be channeled in other ways. Report cards such as those used in Parana State in Brazil are an interesting example (Servilla and Winkler 2003). They provide schools with information that compares indicators for the school (for example, pupil-teacher ratios, examination results, and parent feedback) with reference averages at the national and relevant subnational levels. Report cards for school districts and other higher levels of aggregation can also provide similar comparative information. The availability of such information may be expected to improve conditions in schools in two ways: by creating incentives for underendowed schools to seek redress, and by pinpointing specific schools in the system that warrant the attention of those in charge. In Ethiopia, as in other countries, the use of information on student achievement for accountability purposes remains at an early stage. However, the country has already established a baseline, and this can be built on as part of the broader effort to mobilize appropriate information for better management.

Conclusion

A decade after launching its 1994 New Education and Training Policy, Ethiopia's government can look back with justifiable pride on the progress achieved. The very rapid growth of primary education reflects a genuine commitment to transforming the country's historically elitist system into one that serves all of Ethiopia's children. The government's recent Sustainable Development and Poverty Reduction Program reaffirms its goal of universalizing primary education while also envisioning improvements in quality and the expansion of other levels to enhance the skills profile of the workforce. These ambitions present sobering challenges on many fronts. Accomplishing them will likely require more public spending on education than the sector currently receives, as well as increased spending on education by households in postprimary education. Money alone is unlikely to produce the desired results, however. In primary and secondary education—the levels on which the present study is focused—the system is truly at a crossroad today. The continual deterioration of pedagogical conditions in schools across the country since 1993–94 sounds an alarm that bears heeding. It is a signal that the existing arrangements for service delivery—characterized in particular by the standards for teacher recruitment and classroom construction—may not be suited for expansion on the scale required to attain the goal of universal primary school completion. The work of finding a new model will need to be informed by a hard-nosed, system-wide assessment of potential tradeoffs among the options for moving forward. Better administrative management is also critical for continued progress, so that the available human and financial resources for education are channeled effectively to schools, communities, and households. Transforming these resources into higher levels of school participation and, even more important, into learning outcomes, is the ultimate measure of success in service delivery. This task is difficult in the best of circumstances, but it can be made less so by cultivating a culture of accountability for results and good stewardship of resources throughout the system.

CHAPTER 1

Demography, Economy, and Government Finance

The future holds great promise for Ethiopia. Since the end of the long and tragic civil war in 1991, the country has enjoyed a period of relative peace, albeit one marred by brief border wars with Eritrea in 1998 and again in 2000. As a result, a greater potential now exists to channel more of the country's resources, both material and intellectual, into basic services that directly affect the welfare of the population. Moreover, the reformist government that took power in 1991 introduced major policy changes to shift the economy away from a centralized, command system toward a more liberal, market-based one, the impact of which is already helping to improve economic conditions.[4] Finally, the government set in motion a profound reform in governance to replace the centralized power structure of the communist era with a federal system in which regional and subregional governments play explicit and substantive roles in the country's decisionmaking process.

These domestic developments provide a propitious context for education in Ethiopia. Reinforcing them is the growing international consensus on the goals of development assistance and the means for achieving them. These goals have been crystallized in the form of the eight targets (along with the corresponding indicators and timelines) set forth in the 2000 United Nations Millennium Development Goals (MDGs).[5] Among them are two that

4. Key components of the economic reforms included devaluation, gradual removal of trade restrictions and price controls, and taming inflation, all of which spurred long-neglected private activities. The World Bank is currently preparing a Country Economic Memorandum for Ethiopia that will look more closely into the record of and prospects for economic growth (World Bank, forthcoming).

5. The Millennium Development Goals (MDGs) include eight explicit objectives for reducing poverty: (1) eradicating extreme poverty and hunger; (2) achieving universal primary education; (3) promoting gender equality and empowering women; (4) reducing child mortality; (5) improving maternal health; (6) combating HIV/AIDS, malaria, and other diseases; (7) ensuring environmental sustainability; and (8) developing a global partnership for development. For details on these goals, see www.developmentgoals.org.

relate directly to education: achieving universal primary school completion by 2015, and ensuring gender parity in primary and secondary education by 2005. Regarding the means to reach the goals, some 200 countries, including Ethiopia, have endorsed the view espoused at the 2002 International Conference on Financing for Development in Monterrey, Mexico, that action is required by both rich and poor countries. Rich countries can and must increase aid flows and open their markets to exports from poor countries, while poor countries can and must reform domestic policies to reduce poverty and boost progress toward the MDGs. The tone of the dialog continues to evolve, however, and a view is emerging among some leaders of poor countries that they have an obligation to set their own houses in order regardless of the halting success of the industrialized countries in matching rhetoric with action.[6]

On balance, the prospects for educational development look promising, but the expectations and demands are also commensurately high. Some of these demands are explicitly stated in the government's most recent Sustainable Development and Poverty Reduction Program (Govt. of Ethiopia 2002a). Among them are: achieving equitable universal primary education, improving the quality of the education system at all levels, and training sufficient workers with skills relevant to the country's growing economy. The challenge for the managers of the education system is how to use existing and additional resources to deliver education services effectively and thereby fulfill these expectations.

This report is intended as a contribution to ongoing discussions on the way forward, focusing on primary and secondary education.[7] As such, it is a diagnostic rather than a prescriptive study. To set the stage for examining some of the key policy challenges in these subsectors, the rest of this chapter highlights the country's demography and its social and economic conditions; it also draws attention to key patterns and trends in government finance, including overall allocations of public spending to education. Box 1.1 below provides readers unfamiliar with Ethiopia additional background information on the country.

Demographic and Social Conditions

Below we present selected data on the country's demographic and social profile. In particular, we document its population growth and spatial distribution between urban and rural areas, the extent of poverty, and its health status.

Population Characteristics. Ethiopia is the third most populous country in Africa today, after Nigeria and Egypt, and the eighth largest in the world (based on estimated popula-

6. The World Bank's Operations Evaluation Department reported that in 2000 net transfers to HIPCs were no higher than in 1995, while those to non-HIPCs remained lower. The most recent International Monetary Fund/World Bank Implementation Report on the Highly Indebted Poor Countries (HIPC) Initiative suggests, however, that aggregate net flows to HIPCs rose from US$4.0 billion in 1999 to US$7 billion in 2002 (although in 7 of the 23 African HIPCs, these flows actually fell), and concomitant increases in public spending on education and other poverty-reducing activities have occurred (Hinchliffe 2003). In education, donors took the additional step of launching the Education for All Fast Track Initiative (EFA FTI) in 2002 to mobilize additional donor funding specifically for primary education, but gaps in financing remain as of this writing.

7. See World Bank (2004b) for a discussion of key policy challenges in higher education; and Franz (2003) for a treatment of the issues in technical and vocational education and training.

Box 1.1. Ethiopia at a Glance

Geography: Ethiopia is a landlocked nation bordered to the north by Eritrea and Djibouti, to the South by Kenya, to the east by Somalia, and to the west by the Sudan. With a surface area of 1,127,127 sq. km. (435,186 square miles), it is twice the size of France and slightly less than twice the size of the State of Texas. The country has a temperate climate in the highlands, and a tropical climate in the lowlands with a rainy season from mid-June to mid-September. It is characterized by extreme geographic diversity, and elevations range from 100 m. below sea level (Kobar Sink in the Dallol Depression) to 4,620 m above sea level (Ras Dashen Mountains).

People: Ethiopia's population of 67 million in 2002 consists of more than 100 distinguishable ethnolinguistic entities. The major groups include Oromo (40 percent), Amhara (30 percent), Tigray (12 percent), Sidama (9 percent), Shankella and Somali (6 percent each), and the Afar (4 percent). Amharic and English are the official languages. About 50 percent of Ethiopians (mainly Amhara and Tigray) are Ethiopian Orthodox Christians, 40 percent Muslims, and about 2 percent Protestants and Roman Catholics. Almost 43 percent of the population is below age 15.

Economy: Ethiopia's per capita gross national income of US$100 in 2002 is much lower than the corresponding averages of US$480 for Sub-Saharan Africa and US$420 for low-income countries as a whole. After years of socialist experiment, Ethiopia began to reform its economy in 1991. It has largely dismantled the extensive system of price controls, lowered tax rates, and removed restrictions on the private sector. Agriculture nonetheless continues to dominate the Ethiopian economy: it employs 80 percent of the workforce and accounts for 52 percent of the gross domestic product (GDP), compared with the manufacturing sector's share of 7 percent. Although Ethiopia has one of the lowest exports per capita in the world, the economy is vulnerable to terms of trade shocks because one product—coffee—accounts for as much as 60 percent of its exports revenue in recent years. The country also suffers from frequent and severe droughts, averaging one per decade during the past 100 years, and one every three years during the last 10 years. The most recent drought occurred in 2002 and put as many as 12 million people at risk of starvation. The impact of these factors is reflected in the volatility of GDP growth: it expanded by 7 percent in 2000, grew by only 1.2 percent the following year, and shrank 3.8 percent in 2002.

History, Politics, and Civil Conflicts: Ethiopia has one of the oldest civilizations in the world and is unique among African countries in not having been a foreign colony. According to legend, it was founded by Menelik I, the son of King Solomon and the Queen of Sheba, around the 5th century B.C. Christianity was introduced by missionaries from Egypt and Syria in the 4th century A.D. However, the country experienced bitter religious conflict and isolation from the rise of Islam in the 7th century, Ethiopian resistance to Portuguese hegemony over the Indian Ocean, and attempts to convert Ethiopia to Roman Catholicism. Under the Emperors Theodore II (1855–68), Johannes IV (1872–89), and Menelik II (1889–1913), the kingdom began to emerge from its medieval seclusion. When Menelik II died, his grandson, Lij Iyasu, succeeded to the throne but soon lost support because of his Muslim ties. In 1996 he was deposed by the Christian nobility, and Menelik's daughter, Zewditu was made empress. Her cousin Ras Teferi Makonnen (1892–1975) was made regent and successor to the throne. After the empress' death, he ascended the throne in 1930 as Emperor Haile Selassie. His reign was interrupted in 1936 when Italian forces invaded and occupied Ethiopia, and reestablished five years later when Ethiopian forces, aided by the British, defeated the Italians. In 1974 Haile Selassie was overthrown by rebel soldiers who installed a military government. Major Mengistu Haile Mariam emerged as their leader and in 1977 became the chairman of the ruling council known as the *Derg* (Coordinating Committee of the Armed Forces, Police, and Territorial Army; later called the Provisional Military Administrative Council). In 1977, the *Derg* launched a campaign of terror—the Red Terror—that resulted in the jailing, torture, and death of untold thousands, in an attempt to stem rebellion against its policies promoting a unique nationalism through suppression of ethnic diversity. These struggles galvanized the predominantly ethnic-political movements into action and the *Derg* was eventually overthrown in 1991. The new Transitional Government of Ethiopia (TGE) was established by the Ethiopian Peoples' Revolutionary Democratic Front (EPRDF), a coalition whose key members include the Amhara Nationality Democratic Movement (ANDM), the Oromo People's Democratic Organization (OPDO), the South

(*continued*)

Box 1.1. Ethiopia at a Glance (*Continued*)

Ethiopia Peoples' Democratic Organization (SEPDO), and the Tigray People's Liberation Front (TPLF). The year 1991 also saw the Eritrean People's Liberation Front (EPLF) assuming control of Eritrea and establishing a provisional government. Following a referendum in which Eritreans voted overwhelmingly for independence, the international community recognized Eritrea as a country in 1993.

In Ethiopia, the TGE adopted a new constitution in 1994, which created a federal structure of government consisting of nine ethnic regional governments and two administrative urban councils (Addis Ababa and Dire Dawa). Ethiopia's first multiparty elections were held in 1995. Representation at the federal level is based on population (House of Peoples' Representatives with 545 members) and ethnicity (House of the Federation, with each ethnic group or nationality represented by at least one member, plus an additional member per million inhabitants). The government is headed by a Prime Minister chosen for a five-year term by the majority party. Regional governments were set up by proclamation No. 7/1992. They are run by an elected state council (the highest organ of state authority) and a State Administration (highest organ of executive power). The state council defines the region's policy and has all legislative, executive, and judicial powers over the affairs of the region. As of 2001–02, further decentralization has been set in motion in four regions (Tigray, Amhara, Oromiya, and SNNPR [Southern Nations and Nationalities Peoples Republic]) and two administrative councils (Addis Ababa and Dire Dawa), with the objective of transferring responsibilities from the regional governments to the *woredas* and *kebeles* (the level of administration below the woreda) in a well-defined structure that formalizes the functional responsibilities and constitutional powers of these levels of government. The central government retains control over such areas as defense, foreign affairs, and economic policy.

Relations with the World Bank: Ethiopia became a member of the World Bank on December 27, 1945, and received its first loan in 1951. Since then Ethiopia has received policy and technical support, and project and program financing. Ethiopia is the International Development Association's (IDA) largest beneficiary in Africa; $1.85 billion was committed by January 7, 2004. The World Bank, the International Monetary Fund (IMF), and bilateral development partners are currently supporting a comprehensive debt reduction program under the enhanced Heavily Indebted Poor Countries (HIPC) Initiative, but the details of how much debt relief Ethiopia will receive are still under discussion.

Sources: Bureau of African Affairs, U.S. Department of State 2001, "Background on: Ethiopia," <http://www.state.gov/r/pa/ei/bgn/2859.htm>; Central Intelligence Agency, "The World Factbook: Ethiopia," <http://www.cia.gov/cia/publications/factbook/geos/et.html>; Library of Congress, "Ethiopia—A Country Study," <http://memory.loc.gov/frd/cs/ettoc.html>; Embassy of Ethiopia, Washington, D.C., "Ethiopia: History," <http://www.ethiopianembassy.org/history.shtml>; SIL International, "Languages of Ethiopia," <http://www.ethnologue.com/show_country.asp?name=Ethiopia>; U.S. Department of State, Bureau of African Affairs, November 2001, "Background Note: Ethiopia," <http://www.state.gov/r/pa/ei/bgn/2859.htm>; World Bank, 2001, "Ethiopia Receives Debt Relief Under HIPCI Initiative," <http://web.worldbank.org/WBSITE/EXTERNAL/NEWS/0,contentMDK%3A20035073~menuPK%3A34460~pagePK%3A34370~piPK%3A34424~theSitePK%3A4607,00.html>; World Bank, "Country Brief: Ethiopia," <http://www.worldbank.org/afr/et2.htm>; World Bank, "Ethiopia at a Glance," <http://www.worldbank.org/data/countrydata/aag/eth_aag.pdf>.

tion sizes in 2002 reported in the U.S. Census Bureau International Data Base). Its population grew from 38 million in 1981 to a projected 67 million in 2002, which implies a 76 percent increase in only two decades, or a growth rate averaging 2.6 percent a year during the period. The rate of increase has declined in recent years, but at 2.3 percent a year in the early 2000s, it remains among the fastest in the world. The population is spread across the country's 11 regions (including two administrative urban councils, Addis Ababa and Dire Dawa) in the following proportions in 2002: Tigray (5.8 percent); Afar (1.9 percent);

Amhara (25.6 percent); Oromiya (35.3 percent), Somali (5.8 percent); Benshangul-Gumuz (0.8 percent); Southern Nations and Nationalities Peoples' Region (SNNPR, 19.8 percent); Gambella (0.3 percent); Harari (0.3 percent); Addis Ababa (3.9 percent) and Dire Dawa (0.5 percent).[8]

Consistent with global trends, the country has become more urbanized over time: the share of the population living in cities and towns has climbed steadily from 8 percent in 1965, to 11.5 percent in 1984, and to 18 percent in 1999–00 (Table 1.1). Nonetheless, compared with Sub-Saharan African countries where an average of 26 percent of the population now live in urban areas (World Bank 2003b), Ethiopia remains one of the less urbanized countries on the continent. Literacy rates have improved slightly, rising from 27 percent in 1995–96 to 29 percent in 1999–2000, reflecting gains in the rural areas. The gap between urban and rural areas remains huge, however: 70 percent versus 22 percent in 1999–2000. In the rural areas, the literacy rate among men rose during the period from 29 to 33 percent, while the corresponding rate for women rose from 9 to 11 percent.

Poverty rates are high by any standard.[9] According to the analysis of the latest household survey (Govt. of Ethiopia 2002a), the share of the population living below the poverty line fell from 46 to 44 percent between 1995 and 2000; in rural areas, the rate appears to have declined, 48 to 45 percent, while the rate in urban areas rose, from 33 to 37 percent. These modest changes are not statistically significant, however, suggesting that the economic

Table 1.1. Selected Population Characteristics, Ethiopia, 1984 to 1999–2000

	Census years		Survey years	
Indicator	**1984**	**1994**	**1995–96**	**1999–2000**
Population size (millions)[a/]	42.2	54.9	56.5	64.3
Urban share of population (%)	11.5	15	16	18
Literacy rate among adults (%)[b/]	—	28.9	27	29
Urban areas	—	—	70	70
Rural areas	—	—	19	22
Percentage living below poverty line[c/]	—	—	46	44
Urban areas	—	—	33	37
Rural areas	—	—	48	45

—Data not available.
a. See Appendix Table A1.1 for time series on population size between 1981 and 2002.
b. Adults refer to those aged 15 years and older.
c. The poverty line is established by valuing a "basket" of food items required to maintain a diet yielding 2,200 kilocalories daily per adult, and adding an amount for nonfood items. In Ethiopia, the poverty line at 1995–96 prices is evaluated at 648 Birr per adult equivalent for the food basket, and at 1,075 Birr per adult equivalent to include the nonfood items.
Source: Population size, urban share, and literacy rates, World Bank 2003b, Africa Live Database; incidence of poverty and stunting indicators, Dercon 1997, Govt. of Ethiopia 2002a.

8. The regions are listed in the same order as in practically all official publications with regional breakdown of data. In this report we shall maintain this order where regional data are presented.

9. A more detailed assessment of poverty is in the World Bank's Poverty Assessment for Ethiopia (World Bank 2004c).

reforms started in 1991 succeeded only in preventing poverty from becoming even more widespread than it already was in 1995. Regionally, Tigray, Afar, Benshangul-Gumuz, SNNPR, and Gambella contribute most to the overall incidence of poverty.

Health Conditions.[10] Characteristically for a low-income country, Ethiopia has a low life expectancy (only 42 years) and a high fertility rate (nearly six births per woman over her reproductive life; see Table 1.2). Various economic, social, and cultural factors contribute to high fertility rate. Childbearing starts early—nearly 44 percent of women ages 20–24 would have had at least one child before age 20. While knowledge of modern contraceptive methods is high, only 13 percent of women of child-bearing age (15–49) report ever using a contraceptive method. Significant fertility differences remain regionally. Fertility in Oromiya is estimated at 6.4 births per woman, while it is 4.4 in Harari; rural women have twice as many children as urban women (Govt. of Ethiopia and ORC Macro 2001). As a whole, fertility rates have been coming down, from an average of 6.4 births per woman in 1990 to 5.9 births per woman in 2000. The fact that attitudes are changing in favor of smaller families is suggested by a rise in the proportion of women who want no more children, from 24 percent in 1990 to 32 percent in 2000.

Table 1.2. Selected Health Indicators, Ethiopia, 1984 to 1999–2000

	Census years		Survey years	
Indicator	**1984**	**1994**	**1995–96**	**1999–00**
Overall life expectancy (years)	42[a/]	45[b/]	44	42
Total fertility rate (births per woman over reproductive lifespan	7	6.4[c/]	6	5.9
Maternal deaths per 100,000 live births	—	—	—	871
HIV/AIDS prevalence rate among adults ages 15–49 (percent)	—	—	—	9.0
Indicators for children under 5 years of age				
Mortality rate (deaths per 1,000 live births)	216	—	—	179
Percentage stunted[d/]	—	—	67	57
Percentage severely stunted[d/]	—	—	32	29

—Data not available.
a. Rate refers to 1982.
b. Rate refers to 1992.
c. Rate refers to 1990.
d. Stunting measures a child's long-run nutritional status. A child is stunted if his or her standardized height-to-age ratio is two standard deviations below the mean, and severely stunted, if the ratio is three standard deviations below the mean.
Source: Govt. of Ethiopia and ORC Macro 2001; World Bank 2003c, World Development Indicators.

10. A more detailed documentation of health conditions and health sector issues is the Ethiopia Health, Nutrition and Population Country Status Report, which is being prepared jointly by a World Bank and Ministry of Health team (World Bank and Ministry of Health 2004b).

Two other adult health indicators are worth noting in the table. The maternal mortality rate of 871 deaths per 100,000 live births is one of the highest in Africa, a situation that is not surprising given the country's high fertility rate, the fact that nearly three-quarters of pregnant women receive no antenatal care, and the generally poor accessibility of health care services.[11] As in most countries on the continent, the prevalence of HIV/AIDS is a source of concern. At 9 percent in 2000, the rate is not among the highest in the world, but because of its large population, Ethiopia has the third largest number of people living with the disease—an estimated 3.0 million, after South Africa and India, which have, respectively, 4.7 and 3.7 million.[12]

With regard to child health, the two indicators shown in the table—under-five mortality and the incidence of stunting—have improved in the five years leading to 2000. Yet a child mortality rate of 179 deaths per 1,000 live births is unacceptably high as it implies that the average Ethiopian baby has an 18 percent chance of dying before its fifth birthday. Just as astounding is the widespread incidence of stunting: 57 percent of children under 5 are stunted and 29 percent are severely stunted. These statistics place Ethiopia among countries with some of the highest rates of child malnutrition today.

Incidence of Orphanhood. As in many African countries, the spread of HIV/AIDS in Ethiopia has swelled the ranks of orphans. As of 2000, about 10.5 percent of the children below age 15 have lost one or both parents (Table 1.3). The rate in urban areas is 1.5 times as high as in rural areas, and ranges across regions from just over 10 percent in Amhara and Oromiya, to more than 15 percent in Addis Ababa and Gambella, and to more than 20 percent in Afar.[13] In Ethiopia, the paternal orphanhood rate (children who have lost their fathers) is 1.9 times the maternal orphanhood rates (share of children who have lost their mothers), somewhat smaller than the corresponding ratio of 2.5 times for the countries shown in the table.

Because the risk of losing a parent rises with a child's age, orphanhood rates are higher among older children. In Ethiopia, the rate is 19.0 percent among children ages 10–14, and 10.8 percent among those ages 5–9, for an implied rate of about 15 percent among primary school-age children. This rate places Ethiopia in the middle of the range for the African countries shown in Figure 1.1. The experience of these other countries is instructive: in South Africa, Zambia, and Zimbabwe where HIV/AIDS prevalence rates are about twice as high as in Ethiopia, orphanhood rates have grown to 20 percent; and even where prevalence rates have been brought under control, as in Uganda, the lagged effects of the epidemic continue to show up in high rates of orphanhood.[14] These patterns have important implications for education: if orphans comprise such a large share of the primary school-age population, progress toward the MDG goal of universalizing primary school completion will surely be undermined without a systemic

11. For example, the 50 percent of the population living closest to a health care center travel an average of 7 kilometers to reach the service.

12. The rates among countries with the highest prevalence rates range from around 11 percent in Burundi, Côte d' Ivoire, and Rwanda to 36 percent in Botswana.

13. The rate in Afar should be treated with caution, however, because it is based on only 317 observations.

14. Rwanda's exceptional orphanhood rate of 40 percent reflects the impact of the genocide.

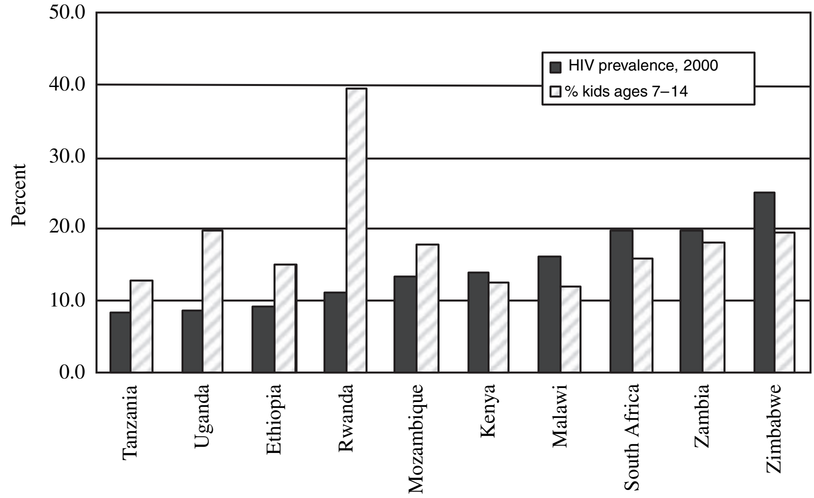
Table 1.3. Percentage of Children below 15 Years of Age Who Have Lost One or Both Parents, Ethiopia and Other African Countries, circa 1999

Country & year of data	Sample size	One parent dead: Mother dead	One parent dead: Father dead	Both parents dead[a/]	Orphan of any type
Ethiopia, 2000	30,763	**3.2**	**6.5**	**0.8**	**10.5**
Urban	3,559	3.6	9.3	1.9	14.8
Rural	27,204	3.2	6.2	0.7	10.1
By region					
Tigray	2058	2.4	7.4	0.8	10.6
Afar	317				21.0
Amhara	8291	2.8	6.5	0.8	10.1
Oromiya	11,730	3.5	5.9	0.8	10.2
Somali	433	4.8	7.5	1.8	14.1
Benshangul-Gumuz	313	3.8	7.8	0.9	12.5
SNNPR	6,741	3.3	6.7	0.7	10.7
Gambella	67	. .	. .	. .	15.2
Harari	65	. .	. .	. .	14.3
Addis Ababa	641	3.9	10.0	1.6	15.5
Dire Dawa	107				11.5
Other African countries					
Ghana, 1998	9,783	1.9	3.6	0.8	6.3
Kenya, 1998	16,881	1.8	6.5	1.9	10.2
Malawi, 2000	28,888	2.9	6.5	2.3	11.7
Mozambique, 1997	19,891	4.2	6.7	2.5	13.5
Namibia, 1992	11,123	1.5	5.0	3.0	9.5
Niger, 1998	17,701	2.0	3.3	1.3	6.6
Tanzania, 1999	8,339	2.2	5.3	1.6	9.1
Uganda, 2000	18,449	2.9	7.2	2.7	12.7
Zambia, 1996	18,107	2.9	7.4	2.3	12.6
Zimbabwe, 1999	11,999	2.6	9.3	3.4	15.3

SNNPR Southern Nations and Nationalities Peoples Republic.
. . Cells where the sample size is too small to compute reliable percentages for individual categories of orphans.
a. Includes children whose parents' vital status is either "deceased" or "unknown."
Source: Ethiopia, Govt. of Ethiopia and ORC Macro 2001, Table 2.3; all other countries, Case, Paxson, and Ableidinger 2002.

effort to support the schooling of this vulnerable population group. While the government does not necessarily need to become directly involved in reaching these children, it can and must put in place policies and resources for others, including nongovernmental organizations, to help orphans invest in their own human capital and so improve their future life chances.

Figure 1.1. Adult HIV/AIDS Prevalence Rates and Orphanhood among Primary School-Age Children, Ethiopia and Selected East African Countries, circa 2000



Note: HIV/AIDS prevalence rates refer to infection among adults ages 15–49; orphans refer to children who have lost one or both parents; data refer to 1992 for Malawi; 1996 for Tanzania; 1997 for Mozambique; 1998 for Kenya, South Africa, and Zambia; 1999 for Zimbabwe; and 2000 for Ethiopia, Rwanda, and Uganda. Primary school–age children refer to those ages 5–14 for Ethiopia, and 7–14; for the other countries.

Source: HIV/AIDS prevalence rates for Ethiopia, Govt. of Ethiopia 2002b and for all other countries, UNAIDS at <www.unaids.org>; orphanhood rates for Ethiopia, from Govt. of Ethiopia and ORC Macro, 2001; for Rwanda, World Bank 2003a; and for all other countries, Ainsworth and Filmer 2002.

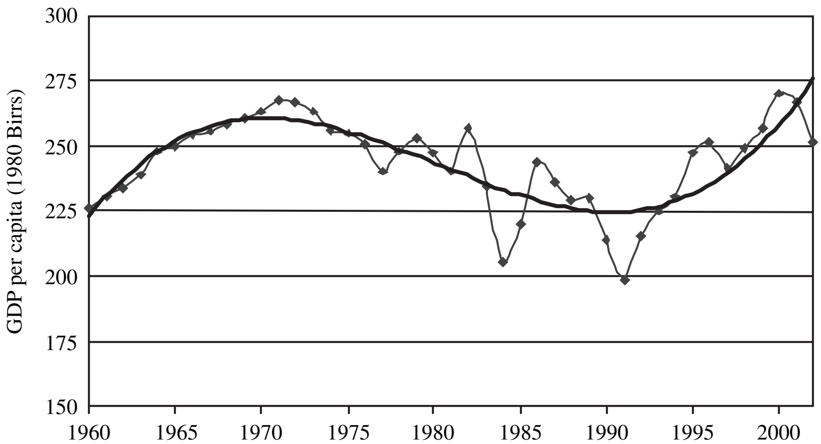
Economic Conditions

In this section we highlight a few key features of economic conditions in Ethiopia.[15] The country has had fairly rapid growth in the 1990s, but it has not always been that way. The previous two decades were characterized by volatile growth and a major deterioration of the real per capita gross domestic product (GDP). In fact, only by the start of the 2000s did the per capita GDP recover to the historical peak achieved in the early 1970s (Figure 1.2).

The growth spurt of the 1990s boosted real per capita GDP at the rate of 1.1 percent a year between 1992 and 2000. The cessation of civil war has obviously been an important factor, but the economic reforms that the new government introduced—which, among other results, kept inflation under control and improved management of the budget deficit, exchange rate, and investment in infrastructure—probably also played a role in the recovery. It is noteworthy that although agriculture is the mainstay of the economy and the focus of the government's development strategy, it was the industrial and services sectors that grew fastest, with output expanding at, respectively, 8.5 and 9.1 percent a year during

15. For a thorough treatment of this topic, readers are referred to the World Bank's Country Economic Memorandum which is currently under preparation.

Figure 1.2. Real Gross Domestic Product Per Capita, Ethiopia, 1960–2002



Source: World Bank 2004d.

1992–2000 (Table 1.4). Of the 5.5 percent per year growth in total GDP over the period, 65.4 percent (or 3.6 percentage points) were contributed with the services sector, compared with agriculture's contribution of 18.2 percent (or 1.0 percentage points; Easterly 2002).

For the purpose of this report, what is important from the foregoing discussion is that while the recent rapid growth is very promising, the prospects for sustaining the pace of expansion remain uncertain as the country seeks to move beyond the recovery phase. The fragility and volatility of Ethiopia's macroeconomic future serve as important reminders that resources are tight and are likely to remain so. Under these conditions, the education sector's claim on public funding will obviously be facilitated by demonstrating good stewardship in the management of resources to achieve tangible results—results that must be measured not only in quantitative expansion of enrollments but also in terms of gains in student learning and, beyond that, in the sector's responsiveness to labor market needs.

Table 1.4. Sources of Recent Economic Growth, Ethiopia, 1992–93 to 1999–00

Sector	Average share of GDP during 1992–93 to 1999–00	Average annual growth rate (percentage p.a.)	Percentage contribution to aggregate average annual growth
Agriculture	48.8	2.1	18.2
Industry	11.0	8.5	16.4
Services	40.1	9.1	65.4
Total GDP	100 %	5.5	100.0

GDP Gross domestic product.
Note: The population size and growth tends are shown in Appendix Table A1.1.
Source: Easterly 2002.

Pattern of Government Finance

In light of Ethiopia's demographic, social, and macroeconomic conditions, we can now examine overall government finance. We begin with a brief description of the fiscal decentralization that has characterized intergovernmental relations since 1994. We then document the composition of and trends in government revenues and expenditures, and finish the discussion with some broad observations on aggregate public spending on education.[16]

Fiscal Decentralization

Since the adoption of a federal structure of government in 1994, the nature of intergovernmental fiscal relations has been undergoing a profound transformation. In the present arrangement, there are three tiers of government and each is accorded, constitutionally, the authority and autonomy to manage its expenditures and revenues. The federal government retains the authority to collect most of the taxes, some exclusively. Only it can run budget deficits and borrow internationally. The revenues collected from all sources are shared with the regions through a block grant formula that has three components—population, level of poverty, and development or expenditure needs (see Table A1.2 for a summary of the formulae that have been used since 1994). The grants received by regions represent the bulk of regional revenues (averaging nearly 80 percent of total regional budgets excluding external funds); these grants are untied, meaning that regional governments have wide latitude to allocate the funds across various regional priorities.

At the regional level, these grants are supplemented by the region's own revenues generated through a number of taxes that the regions have the authority to collect, primarily on income from regional employees, land use, and sales within regions. The grant from the federal government and the region's self-generated revenues, along with the regional allocation of foreign funds received by the federal government, add up to the regional budget. Once the regions determine their resource envelope, they are expected to transfer some of the resources to the lower levels of government (*woredas*). For the regions undertaking further decentralization to the *woredas,* the sharing is done also as untied block grants according to a formula, similar to the national formula with slight regional variations. In the nondecentralizing regions, regional governments transfer resources according to planned expenditures submitted by the *woredas* to the regional governments.[17]

Under the new structure of fiscal relations, each level of government is responsible for delivering certain services. In education, the federal government is responsible for higher

16. A more detailed discussion of education finance is developed in Chapter 3. Readers are also referred to the World Bank's 2003 Ethiopia Public Expenditure Review for an assessment of overall government finance.

17. The decentralizing regions and administrative councils are: Tigray, Amhara, Oromiya, and SNNPR; and Addis Ababa and Dire Dawa. The plan is to implement the decentralization program over the period 2001–02 to 2006–07 to transfer many responsibilities from the regional government to the *woreda* and even *kebele* level. During this period, the framework for the new decentralized structure will be laid down, and will include constitutional empowerment of *woreda* governments, division of functional responsibilities between *woredas* and regional governments, and clarification of organizational structure and functions of offices.

education and some teacher training; regional governments for secondary education, teacher training, and technical and vocational education and training; and *woreda* governments for primary education. This arrangement means that when evaluating government spending on education, it is important to account for expenditures on education by all the different actors.[18] A proper accounting is also needed to provide a baseline for informing discussions about spending priorities, as well as for tracking the impact of the new structure on the global pattern of spending.

Trends in Overall Government Revenues and Expenditure

Below we present key indicators of revenue and expenditure trends since the 1980s and draw attention to the relation between them.

Government Revenues. Table 1.5 shows selected indicators of consolidated government revenues between 1980–81 and 2001–02 (the horizontal lines in the table mark the transitional period from the Mengistu regime to the present government). The data offer two clear observations. The first is that revenues were volatile in the last two decades. Three phases are observable, consistent with the recent history of Ethiopia. In the first phase, the *Derg* years (1981–89), total revenues including grants, as a percentage of gross domestic product (GDP), rose from 18 percent in 1981 to 28 percent in 1989, when they peaked. In the second phase, which coincides with the collapse of the *Derg* regime and the immediate transition (1990–92), total revenues including grants, as a share of GDP, fell to their lowest level. In the final phase, 1993–2001, which defines the current government's rule, revenues as a percentage of GDP rose again, and reached 24 percent by 2002.

The second observation is that the economy is grant-dependent, because almost 20 percent of revenues come from external grants. Nonetheless, revenues excluding external grants have been growing, rising from 11.9 percent of GDP in 1992–93 to 19.1 percent in 2001–02, or the equivalent of 79.4 Birr per person to 194.7 Birr per person (in constant 1994–95 prices)—a 2.4-fold increase over the period. Despite this very positive trend, Ethiopia's level of domestic resource mobilization, which averaged about 17.2 percent of GDP throughout the period, remains slightly below the corresponding statistic of 19.0 percent for 33 low-income African countries around 2000, and 20.0 percent for 21 non-African low income countries (Bruns, Mingat, and Rakotomalala 2003).[19]

Government Expenditures. The relevant data appear in Table 1.6. In the 1990s, total government spending as a percentage of GDP rose steadily and peaked by the end of the decade, a pattern that is strikingly similar to the trends in this statistic in the 1980s. Throughout the 1980s and 1990s, expenditures exceeded revenues, implying a routine reliance on borrowing and deficit financing to fund government spending. Total spending includes a substantial share devoted to capital spending, averaging about 34 percent in the

18. For details on the preparation of the data on education finance for this report, see Technical Note 1 on the Data on Current Public Expenditure on Education in Ethiopia at the end of this report.

19. Countries in the cited study are those that have yet to achieve the goal of universal primary school completion as of 2002.

Table 1.5. Trends in Overall Government Revenues, Ethiopia, 1980–81 to 2001–02

Ethiopian Calendar (E.C.)	Gregorian Calendar	Total government revenues: In constant 1994–95 Birr	Total government revenues: Index (1994–95=100)	Total government revenues: As percentage of GDP	Percentage share of external grants in total revenues	Per capita revenues net of external grants: In constant 1994–95 Birr	Per capita revenues net of external grants: Index (1994–95=100)
1973	1980–81	4,837.8	100	18.2	9.8	124.7	100
1974	1981–82	5,097.4	105	19.0	12.2	127.8	102
1975	1982–83	5,628.7	116	19.4	10.7	137.3	110
1976	1983–84	6,091.4	126	21.5	10.0	144.3	116
1977	1984–85	5,343.8	110	21.3	21.4	123.1	99
1978	1985–86	6,206.1	128	22.5	13.6	138.8	111
1979	1986–86	6,608.7	137	21.1	9.9	143.4	115
1980	1987–88	8,102.9	167	25.8	15.5	170.2	137
1981	1988–89	8,779.0	181	28.0	17.0	178.1	143
1982	1989–90	6,404.7	132	19.9	11.3	125.1	100
1983	1990–91	4,806.0	99	16.1	14.6	90.7	73
1984	1991–92	3,601.3	74	13.2	19.7	65.7	53
1985	1992–93	4,231.1	87	13.7	12.7	79.4	64
1986	1993–94	5,552.4	115	17.4	20.0	101.1	81
1987	1994–95	7,044.6	146	20.8	16.1	124.7	100
1988	1995–96	7,987.1	165	21.3	13.6	137.2	110
1989	1996–97	8,628.6	178	21.8	16.6	144.3	116
1990	1997–98	8,125.1	168	20.9	13.6	132.5	106
1991	1998–99	8,808.7	182	21.4	16.9	140.3	112
1992	1999–00	9,208.4	190	21.6	15.4	143.2	115
1993	2000–01	11,236.8	232	24.2	20.5	170.8	137
1994	2001–02	13,101.1	271	23.5	18.6	194.7	156

Note: 1982 E.C. to 1984 E.C. correspond to the transition from the Mengistu regime to the new government.
Source: Based on data in Appendix Table A1.1

decade since 1992–93, which is slightly larger than the average of 30 percent in the 1980s. With regard to interest payments on public debt, the level is noticeably higher in the 1990s than in the 1980s. Still, the amounts relative to the GDP remain modest, averaging about 2 percent of GDP in the years since 1996–97 or between 6 to 9 percent of total government spending. The composition of the debt burden has changed, however; the interest paid on external debt rose from 23 percent of total interest payment when the new government took power, to 47 percent in 2001–02.

Relation between Revenues and Expenditures. To round out the foregoing discussion, we plot in Figure 1.3 below the relationship between per capita revenues and per capita recurrent spending. The data show that for every additional Birr per capita mobilized, the government is able to set aside about 0.64 Birr for current spending. The positive relationship between

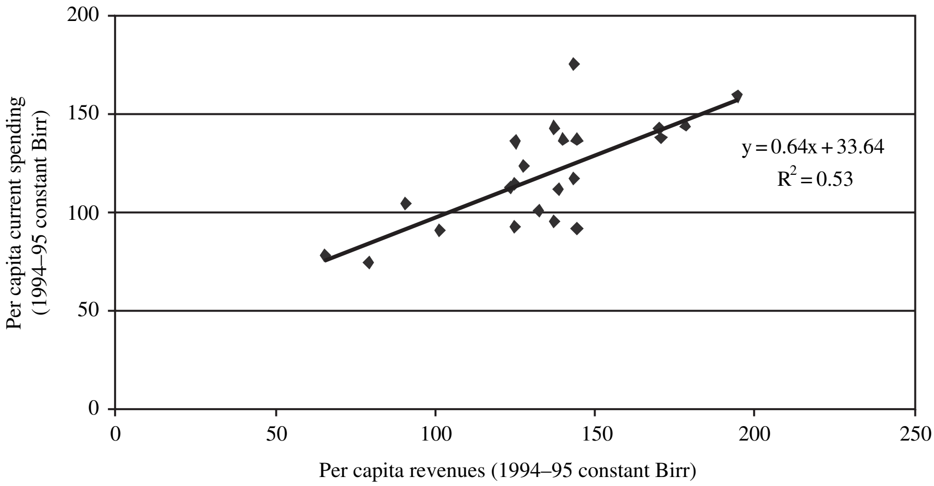
Table 1.6. Trends in Total Government Expenditure, Ethiopia, 1980–81 to 2001–02

		Total Spending					Recurrent Spending		Interest on all public debt		
E.C.	Gregorian Calendar	In 1994–95 constant Birr	Index (1994–95=100)	As percent-age GDP	As ratio of revenues[a/]	Per capita spending (1994–95=100)	As percentage of total spending	As percentage of GDP	As percentage of total spending	As percentage of GDP	Percentage share of interest paid on external debt
1973	1980–81	5,668.1	100.0	21.3	1.17	100	77.9	16.6	3.7	0.8	22.8
1974	1981–82	6,629.0	117.0	24.7	1.30	114	74.3	18.3	3.0	0.7	21.1
1975	1982–83	8,756.2	154.5	30.2	1.56	146	67.1	20.3	2.4	0.7	22.8
1976	1983–84	8,005.0	141.2	28.3	1.31	130	72.1	20.4	4.4	1.2	18.2
1977	1984–85	7,024.4	123.9	28.0	1.31	111	69.4	19.4	5.8	1.6	12.9
1978	1985–86	7,780.0	137.3	28.3	1.25	119	63.9	18.0	4.8	1.3	20.0
1979	1986–86	8,187.3	144.4	26.1	1.24	122	65.6	17.1	5.5	1.4	31.9
1980	1987–88	9,663.0	170.5	30.8	1.19	139	70.2	21.6	5.2	1.6	38.8
1981	1988–89	10,709.8	188.9	34.2	1.22	149	66.2	22.6	4.3	1.5	33.9

1982	1989–90	9,543.6	168.4	29.7	1.49	128	72.7	21.6	4.3	1.3	20.7
1983	1990–91	7,353.0	129.7	24.6	1.53	95	75.0	18.5	5.4	1.3	19.2
1984	1991–92	5,504.9	97.1	20.2	1.53	69	77.4	15.6	7.3	1.5	19.9
1985	1992–93	6,037.8	106.5	19.6	1.43	78	65.8	12.9	10.2	2.0	22.9
1986	1993–94	7,995.9	141.1	25.0	1.44	100	62.0	15.5	13.5	3.4	15.4
1987	1994–95	8,371.9	147.7	24.7	1.19	101	62.3	15.4	10.0	2.5	28.8
1988	1995–96	9,058.7	159.8	24.1	1.13	107	61.0	14.7	10.1	2.4	33.9
1989	1996–97	9,461.4	166.9	23.9	1.10	108	57.9	13.8	9.3	2.2	30.8
1990	1997–98	9,733.0	171.7	25.0	1.20	109	63.1	15.8	7.4	1.9	37.0
1991	1998–99	12,615.5	222.6	30.6	1.43	138	67.9	20.8	6.4	2.0	38.6
1992	1999–00	14,099.7	248.8	33.0	1.53	150	80.0	26.4	6.5	2.2	35.6
1993	2000–01	13,473.0	237.7	29.1	1.20	140	67.4	19.6	7.0	2.0	46.8
1994	2001–02	16,402.5	289.4	29.4	1.25	167	65.3	19.2	—	—	—

— Data not available.
a. Including grants.
Source: Based on data in Appendix Table A1.3.

Figure 1.3. Relation between Government Revenues and Current Spending, Ethiopia, 1980–81 to 2001–02



Note: Government revenues exclude grants.

Source: Based on data for 1980–81 to 2001–02 in appendix tables A1.1 and A1.3.

revenues and recurrent spending draws attention to the reality that the more resources that can be raised domestically, the more the government can finance its day-to-day effort to deliver services. This relationship is especially important for a sector such as education where the availability of recurrent spending is so crucial for schools to function smoothly.

Aggregate Trends in Public Spending on Education

The preceding section described recent developments in the resource envelope of the government. It is appropriate to ask how much of the available resources have been allocated to education, and how well Ethiopia compares with other low-income countries in terms of the resources it devotes to this important area of social development.

Recent Patterns in Historical Perspective. Table 1.7 shows that total public spending on education has been rising since 1992–93, marking a significant break from the past. It averaged 3.6 percent of GDP in the decade following 1992–93, and 13.8 percent of total government spending, compared with an average of 2.4 percent of GDP and 8.7 percent of total government spending from 1980–81 to 1988–89 under the Mengistu regime. Public spending on education as a percentage of domestic revenue resources rose even higher, averaging 21 percent in the period from 1992–93 to 2001–02, compared with 12.9 percent between 1980–81 and 1988–89.

These broad positive trends in education financing have to be seen within the context of two related facts. First, a disaggregation of the data between recurrent and capital spending (possible only for the series after 1992–93) shows that a sizable share of the total

Table 1.7. Trends in Public Spending on Education, Ethiopia, 1980–81 to 2001–02

		Total recurrent and capital spending			Recurrent spending[a/]		
(E.C.)	Gregorian Calendar	As percentage of GDP	As percentage of total government spending	As percentage of government revenues net of grants	As percentage GDP	As percentage of total spending on education	As percentage of total government current spending net of debt interest payment
1973	1980/81	2.1	10.0	13.0	—	—	—
1974	1981/82	2.4	9.7	14.4	—	—	—
1975	1982/83	2.2	7.3	12.7	—	—	—
1976	1983/84	2.5	8.8	12.9	—	—	—
1977	1984/85	2.4	8.4	14.1	—	—	—
1978	1985/86	2.4	8.5	12.3	—	—	—
1979	1986/86	2.4	9.3	12.8	—	—	—
1980	1987/88	2.5	8.2	11.6	—	—	—
1981	1988/89	2.9	8.5	12.4	—	—	—
1982	1989/90	2.8	9.4	15.8	—	—	—
1983	1990/91	2.5	10.1	18.1	—	—	—
1984	1991/92	2.5	12.6	23.9	—	—	—
1985	1992/93	2.8	14.3	23.4			

(*continued*)

Table 1.7. Trends in Public Spending on Education, Ethiopia, 1980–81 to 2001–02 (*Continued*)

		Total recurrent and capital spending			Recurrent spending[a/]		
(E.C.)	Gregorian Calendar	As percentage of GDP	As percentage of total government spending	As percentage of government revenues net of grants	As percentage GDP	As percentage of total spending on education	As percentage of total government current spending net of debt interest payment
1986	1993/94	4.0	15.8	28.5	3.0	75.6	24.6
1987	1994/95	3.5	14.3	20.3	2.7	76.1	20.9
1988	1995/96	3.8	15.7	20.6	2.6	68.2	21.0
1989	1996/97	3.6	15.3	20.1	2.6	71.7	22.5
1990	1997/98	3.5	14.1	19.5	2.6	74.2	18.8
1991	1998/99	3.5	11.5	19.9	2.6	73.6	13.8
1992	1999/00	3.1	9.5	17.3	2.6	82.0	10.6
1993	2000/01	4.1	14.2	21.5	3.0	71.5	16.9
1994	2001/02	4.0	13.6	21.0	3.0	75.9	

— Data not available.

a. Excludes spending on items such as vehicles, equipment, building, and construction materials which were classified in the budget data as recurrent spending; for actual data, see Appendix Table A1.5

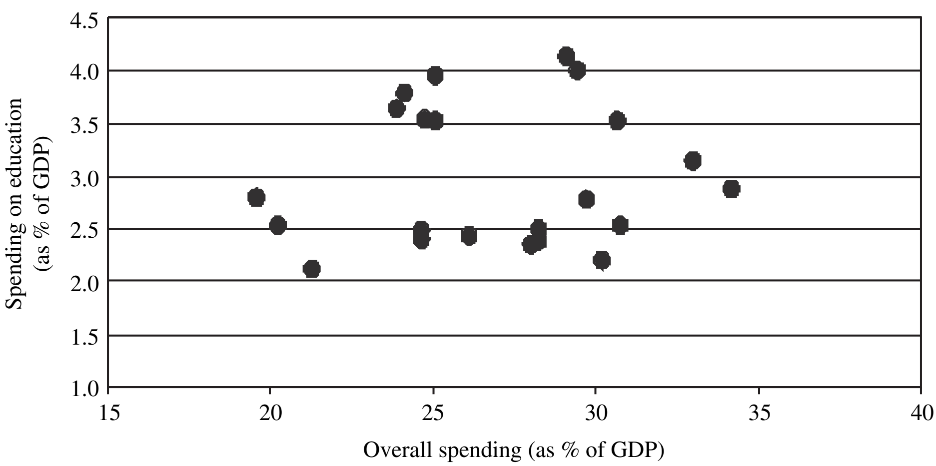
Source: Computed from data in Appendix Tables A1.1, A1.3.–A1.5.

amount has gone into capital investment. Thus, while total public spending on education as a percentage of GDP has been rising in the 1990s, recurrent spending as a percentage of GDP has remained constant for most of the decade.

The second related fact regarding education financing trends is that in the last two decades, increases in government spending did not translate immediately into increases in spending on education. A plot of total government spending relative to GDP and total education spending relative to GDP, between 1980–81 and 2001–02, reveals no systematic relationship (Figure 1.4). This suggests that historically education did not automatically become a priority when the government increased its overall spending, which is understandable within the historical context of the country's long civil wars and recurrent famines. Nonetheless, the trend in recent years under the new government is in the right direction, as Figure 1.5 shows. The figure first converts all recurrent education spending, for which we have data only since 1993–94, into constant 1994–95 Birr. It then plots these real expenditures relative to the 1993–94 spending. By indexing spending in every year to the spending in 1993–94, it becomes clear that spending on education rose after 2000, trailing by two years the rise in total recurrent government spending that coincided with the period of the border war with Eritrea. However, since the end of hostilities in 2000, real recurrent government spending has remained higher than the historical levels in the 1990s, and education spending has edged up as the government turned its attention to its program for poverty reduction, which includes education as a key component.

Cross-country Comparisons. Ethiopia's recurrent spending on education, at 3.0 percent of GDP in 2001–02, is slightly lower than the average of 3.2 percent of GDP among 54 other low-income countries circa 2000, but about the same as the average for African countries in the

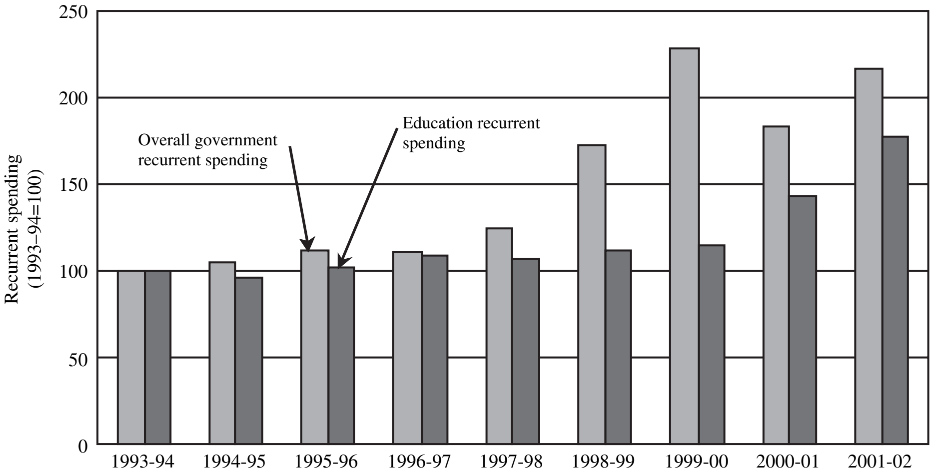
Figure 1.4. Relation between Overall Government Spending and Government Spending on Education, Ethiopia, 1980–81 to 2001–02



Note: Both axes refer to recurrent and capital spending.

Source: Based on data in tables 1.6 and 1.7.

Figure 1.5. Trends in Government Overall Recurrent Spending and Education Recurrent Spending, Ethiopia, 1993–94 to 2001–02



Note: The spending in both series are expressed in 1994–95 constant Birr, indexed to spending in 1993–94, the first year in the series.

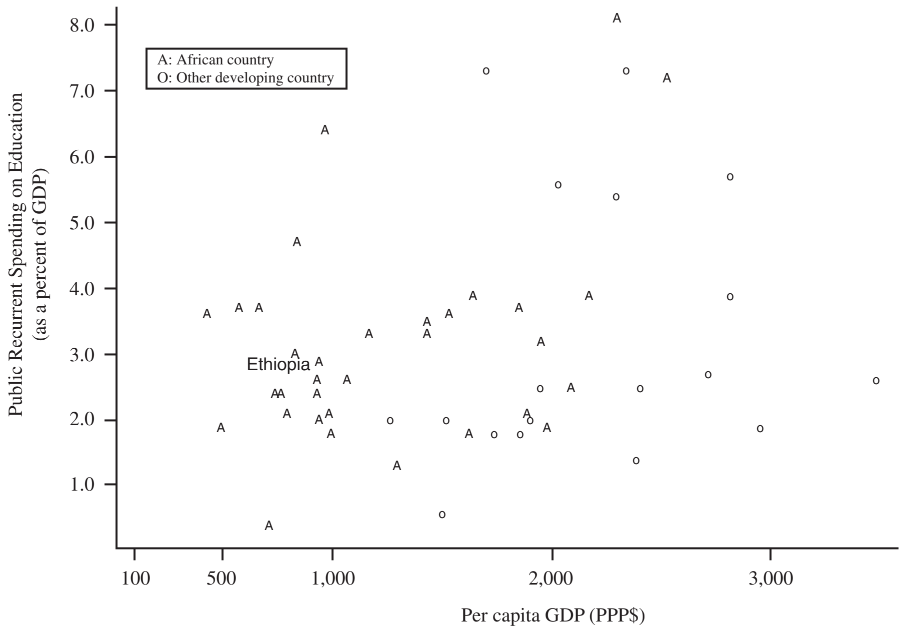
Source: Based on data in tables 1.6 and 1.7.

sample (Bruns, Mingat, and Rakotomalala 2003). It falls far short, however, of the average of 3.8 percent among the countries deemed closest to achieving the goal of universal primary completion. The comparative data, which are plotted in Figure 1.6, suggest two lessons: first, public spending on education in Ethiopia probably needs to be increased beyond its current level if the country is to advance toward the education Millennium Development Goal; second, the fact that only a few countries have managed to raise spending above 4.0 percent of GDP means that in Ethiopia as elsewhere it will probably require an extraordinary confluence of favorable circumstances to sustain claims on public spending beyond this threshold.

Conclusion

There is wide acknowledgment about the primacy of education in the fight against poverty and its role in promoting social wellbeing (for example, Case 2001). For Ethiopia, the end of internal conflict has created the opportunity for government to give even more attention to the development of the sector. Indeed, a clear political commitment and momentum now exist to transform the historically elitist and narrowly accessible system into one that offers opportunities to the mass of the population. The recent decentralization of governmental structure, finances, and functions will undoubtedly help make this goal a reality. Accordingly, the government's expectation is that the policy of decentralization will produce results by clarifying responsibilities for service delivery at each level of government; by enabling and empowering lower levels of government to take direct responsibility for managing their own

Figure 1.6. Public Recurrent Spending on Education and Per Capita GDP, Ethiopia and Other Countries, circa 2000



GDP Gross domestic product; PPP Purchasing power parity.

Source: Bruns, Mingat, and Rakotomalala 2003 for data on recurrent public spending on education; World Bank SIMA database for data on per capita GDP.

affairs; and by making local administrations more accountable for service delivery, particularly in such areas as education, health, and agricultural extension.

Matching goals with means is at the crux of the challenge facing policymakers in Ethiopia. The country's historical pattern indicates that education has not always been prioritized in the allocation of public spending, quite understandable in the context of the country's lengthy civil wars and persistent food insecurity. However, recent developments suggest a positive turn of events, as real recurrent spending since 2000 has begun to edge upward. This progress has been aided by internal developments—including an end to hostilities with Eritrea and increased mobilization of domestic resources—and international consensus to build partnerships across countries to accelerate the accessibility of education through such initiatives as HIPC, MDGs, EFA, and the increased use of budget support mechanisms (such as the World Bank's Poverty Reduction Support Credit) to channel donor funds. Because all these initiatives provide additional sources of increased funding for education, there is a good prospect that recent increases in public spending on education will continue. Yet, there is no escaping the reality that the competition for public resources will be tight, as other sectors such as roads, water, and health can also make a legitimate claim based on their contribution to poverty reduction. Thus, while every effort must be made to raise recurrent spending on education from its present level of 3.0 percent of

GDP, pushing the sector's claim beyond 4.0 or 5.0 percent of GDP is likely to prove progressively difficult, perhaps even elusive.

For the managers of the education sector, the challenge is how best to capitalize on the favorable conditions of political commitment and the promise of increased domestic and international funding in order to meet the expectations for the sector: achieving universal basic education and expanding the opportunities for postbasic education; equipping students and frontline teaching and administrative staff in such a way as to improve learning outcomes; and producing graduates in sufficient numbers and with the appropriate skills to sustain the growth of the economy. This report will focus on the issues as they pertain to primary and secondary education and, where appropriate and possible, draw in relevant information on the other levels to provide the big picture. Moving beyond the question of the global resource envelope, the rest of the report will examine the policy choices that are available to manage the fiscal viability of a system that is expected to serve a vastly expanded clientele, as well as draw attention to the possibilities for enhancing the efficiency and effectiveness of service delivery.

CHAPTER 2

Enrollments and Patterns of Student Flow

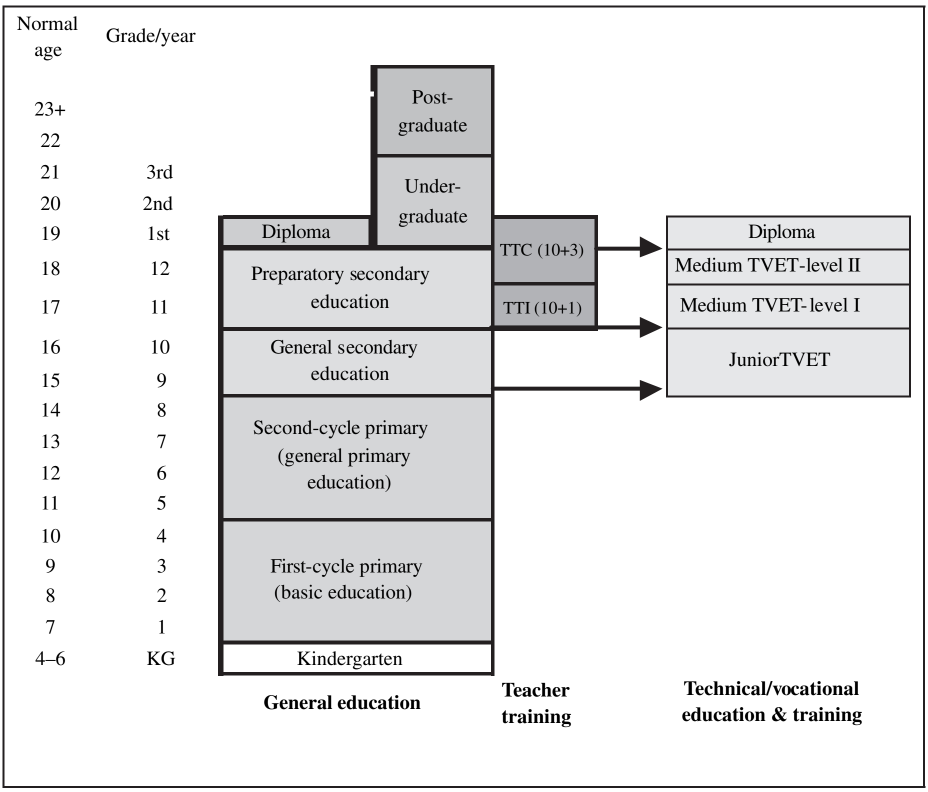
This chapter traces the historical expansion of enrollments across levels of education in Ethiopia, places the system's coverage in a cross-country perspective, and draws attention to key indicators of student flow—in particular, entry rates to first grade, survival and completion rates, and repetition rates in primary and secondary education. The results show that the country has made enormous progress on all quantitative measures of coverage. Primary school enrollments in 2002–03 were 2.8 times what they were in 1993–94 when the new government came to power, while those in secondary education and regular government higher education alone were, respectively, 1.9 and 2.3 times as large. In terms of student flow, an estimated 60 percent of each age cohort in 2000–01 were expected eventually to enter grade 1, compared with 37 percent in 1995–96; and about 54 percent of each entering cohort of first-graders in 2000–01 were expected to reach grade 5, up from 49 percent in 1993–94. While these trends are beginning to look like a clear break from a past in which access to even basic education was highly restricted, there is no room for complacency if the country is to achieve the Millennium Development Goal of universal primary school completion by 2015. Critical decisions loom on the horizon regarding the duration of schooling to be universalized, the placement of selection points to manage the growing pressures on postprimary education, the choice of indicators to track progress in the sector, particularly at the lower levels, and the design of interventions to continue boosting primary school completion.

Structure of the Education System

From 1962 to 1994, the education system had a 6-2-4 structure: six years of primary schooling, followed by two years of junior secondary education, and four years of senior secondary education. National examinations at the end of each cycle (in grades 6, 8, and 12) regulated student selection from one cycle to the next. Following the 1994 Education and Training Policy and Strategy, the government created a new structure (Figure 2.1). Still in place today, it consists of an eight-year primary education cycle, which is itself divided into a basic education cycle covering grades 1–4, and a general primary cycle covering grades 5–8, followed by two years of general secondary education (grades 9–10), and two years of preparatory secondary education (grades 11–12). National examinations are now administered only at the end of grades 10 and 12; regional examinations have replaced those at the end of grade 8.

The changeover to the 4-4-2-2 structure was motivated in part by a concern that the education system existing in 1994 was too similar to the models in developed countries and therefore unsuited to conditions in Ethiopia. It was also perceived to be performing poorly in terms of access, equity, relevance, and quality. The 1994 education reforms sought to address these problems and included the following features among others:

Figure 2.1. Structure of the Ethiopian Education System in 2003–04



Note: The duration of postsecondary courses may vary by field of study.

Source: Ministry of Education, Govt. of Ethiopia.

- Renewed emphasis on student learning and problem-solving skills;
- Revitalization of technical and vocational education and training;
- The teaching of primary students in their mother tongue; and
- Self-contained classes in grades 1–4 (i.e., one teacher for all the core subjects).

The objectives at each level of education were clarified as follows: primary education was to provide functional literacy; general secondary education in grades 9 and 10 was to prepare students for further education, including technical and vocational options; and preparatory secondary education (grades 11–12) was to groom students for studies in higher learning institutions (colleges and universities) or in technical and vocational fields. As Figure 2.1 shows, students who finish grade 8 can compete for places in programs of junior technical and vocational education and training (TVET); those who complete grade 10 can vie for places in preparatory general education, teacher training institutes or colleges (TTIs or TTCs), or programs offering medium level TVET; and those who make it through grade 12 can compete for places in diploma- or undergraduate-level courses in the universities or in TVET programs.[20]

While the length of the primary and secondary cycles has been stable since 1994, the duration of some courses in postsecondary education has been adjusted over the past few years. Programs in the TTIs and TTCs were recently redesigned to last one and three years, respectively, after grade 10; previously, TTI courses lasted three years after grade 10, and TTC courses, one year after grade 12. Diploma-level courses in the universities used to last two to three years, but as of 2003–04, were shortened to one year; and undergraduate-level courses that used to last three to four years in most fields, shortened to three years. As of the 2001–02 school year, entry to preparatory secondary education (grades 11 and 12) was sharply reduced, and repetition practically eliminated. Most of the grade 10 graduates are expected to pursue courses in TVET in line with the government's decision to expand this subsector.

Overview of Enrollment Trends

The Ethiopian Ministry of Education maintains extensive records of enrollments dating back to 1967–68 for general education, 1985–86 for higher education, and 1995–96 for TVET and teacher training. This section documents the aggregate number of students over time, the share of enrollments in nongovernment institutions, and the magnitude of enrollments in evening classes and in nonformal basic education.

In 2002–03, the formal system catered to a total of more than nine million students, compared with just over half a million in 1967–68 (Table 2.1). Between these years, enrollments increased 16-fold in primary education, and by 26 times in secondary education. Dramatic increases also occurred in the other subsectors: the number of students in TVET rose from fewer than 3,000 in 1995–96 to more than 54,000 by 2002–03; those in higher education rose from around 18,000 in 1990–91 to more than 48,000 by 2001–02.

20. Graduates of TTIs are officially certified to teach in grades 1–4, and those of TTCs, in grades 5–8.

Table 2.1. Enrollments by Level in Government and Nongovernment Institutions, Ethiopia, 1967–68 to 2001–02

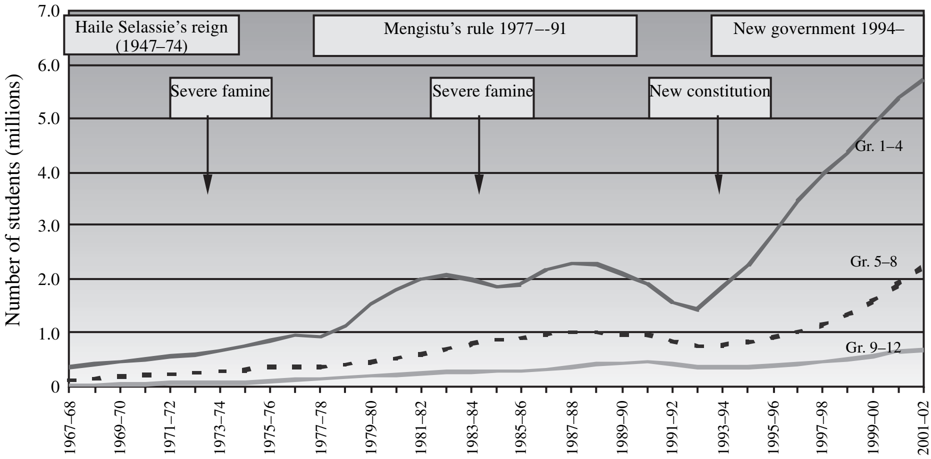
School Year	Preprimary	Primary (Grades 1–8)	Secondary (Grades 9–12)	Technical and Vocational Education and Training	Teacher Training Institutes	Higher education (Regular programs only)[a]
1967–68	—	496,334	26,690	—	—	—
1970–71	—	728,548	53,220	—	—	—
1975–76	—	1,226,124	90,091	—	—	—
1980–81	—	2,341,437	216,876	—	—	—
1985–86	—	2,811,910	292,385	—	—	18,457
1990–91	—	2,871,325	453,985	—	—	17,895
1995–96	—	3,787,919	402,753	2,738	5,900	17,378
2000–01	109,358	7,274,121	649,221	8,639	6,224	46,812
2001–02	118,986	7,982,760	684,630	38,176	6,080	48,143
2002–03	123,057	8,572,315	626,714	54,026[b]	7,002	77,946
2003–04[c]	—	9,343,428	725,059	—	—	80,698

—Data not available at time of report writing.
Note: All data in this table refer to enrollments in regular programs only.
a. Includes students in diploma-level teacher training colleges, but excludes part-time students and those in evening or summer (*Kiremt*) courses.
b. Data probably incomplete because of missing information from several regions.
c. Preliminary data available as of September 2004.
Source: Govt. of Ethiopia 1994 E.C., for 1970–1993 data; Govt. of Ethiopia 1997, for 1995 data; Govt. of Ethiopia 2001, for 2000 data; and Govt. of Ethiopia 2002, for 2001 data.

Primary and Secondary Education

The increase in enrollments since 1967–68 did not follow a smooth path. Instead there were of periods of expansion followed by reversals that generally coincided with political turbulence in the country and severe famines (Figure 2.2). Enrollments in grades 1–12 grew at 12 percent a year during 1967–68 to 1976–77, a pace not significantly disturbed by the famine of 1973–74 and the overthrow of Haile Selassie in a 1974 coup led by Teferi Benti. In 1977–78, the year that Mengistu Haile Mariam took power, enrollments at all levels fell by 2 percent, but the setback proved temporary. Enrollments grew by 20 percent the following year, by 28 percent the year after that, and at the rate of 13 percent a year until 1982–83 when the beginnings of a severe famine caused enrollments to increase by only 6 percent from the previous year. In the subsequent two years, the country fell victim to one of the worst famines in its history, and the number of children in school shrank in absolute terms. Although enrollments did recover by 1987–88 to the prefamine peak, the gains proved to be short-lived as the country plunged into the political turmoil that eventually culminated in the overthrow of Mengistu's regime in 1991. Enrollments in 1992–93 were 31 percent smaller than they were in 1988–89 and about the same as at the start of the 1980s. As the figure clearly demonstrates, the large swings in enrollments are due mainly to instability in the enrollments in grades 1–4. Under the new government, aggregate

Figure 2.2. Enrollments in Grades 1–12, Ethiopia, 1967–2002



Note: Data include only students in regular programs in government and nongovernment schools.

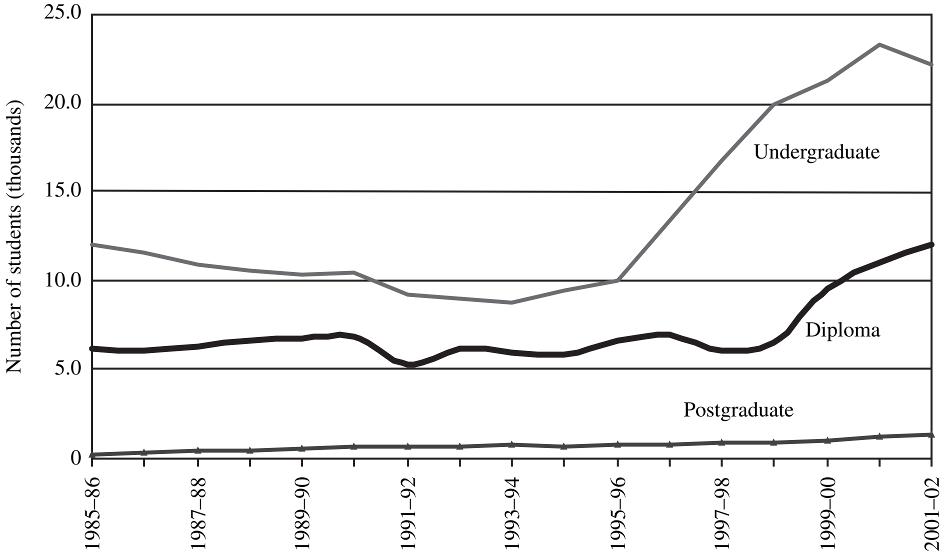
Source: Govt. of Ethiopia 1994, for 1967–68—1992–93 data; Govt. of Ethiopia 1995, for 1993–94 data; Govt. of Ethiopia 1996, for 1994–95 data; Govt. of Ethiopia 1997, for 1995–96 data; Govt. of Ethiopia 1998, for 1996–97 data; Govt. of Ethiopia January 1999, for 1997–98 data; Govt. of Ethiopia August 1999, for 1998–99 data; Govt. of Ethiopia 2000, for 1999–00 data; Govt. of Ethiopia 2001, for 2000–01 data; and Govt. of Ethiopia 2002, for 2001–02 data.

enrollments in grades 1–12 have been growing at a sustained pace of about 9 percent a year between 1992–93 and 2001–02—a remarkable achievement indeed given the history of stagnation and uneven growth in the past.

Postsecondary Education

Enrollments include students in diploma-level programs as well as those in programs leading to undergraduate and postgraduate degrees. Figure 2.3 shows the trends since 1985–86, the earliest year for which data are available. Because the private sector has historically been relatively undeveloped, the figure pertains only to students in government institutions. In the decade up to 1996–97, enrollments at all three levels of postsecondary studies had been somewhat stagnant, rising by only 13 percent among diploma-level students and by 11 percent among undergraduates. The number of postgraduate students jumped nearly threefold over the same period, but the increase started from an extremely small base of only 279 students in 1985–86. After 1996–97, enrollments at all levels of postsecondary studies climbed rapidly—by 2001–02 the system was catering to more than 12,000 diploma-level students and more than 22,000 undergraduate students, compared with the corresponding enrollments of fewer than 6,000 and about 10,000 in 1995–96. At the postgraduate level, the historical increase in enrollments continued to be sustained, even though total enrollments remained relatively small in 2001–02, just over 1,300 students.

Figure 2.3. Enrollments in Regular Programs in Higher Education, Ethiopia, 1985–2002



Note: Data on enrollments in private institutions and evening classes are excluded for lack of a sufficiently long time series.

Source: Govt. of Ethiopia 1994, for 1985–86—1992–93 data; Govt. of Ethiopia 1995, for 1993–94 data; Govt. of Ethiopia 1996, for 1994–95 data; Govt. of Ethiopia 1997, for 1995–96 data; Govt. of Ethiopia 1998, for 1996–97 data; Govt. of Ethiopia January 1999, for 1997–98 data; Govt. of Ethiopia August 1999, for 1998–99 data; Govt. of Ethiopia 2000, for 1999–2000 data; Govt. of Ethiopia 2001, for 2000–01 data; and Govt. of Ethiopia 2002, for 2001–02 data.

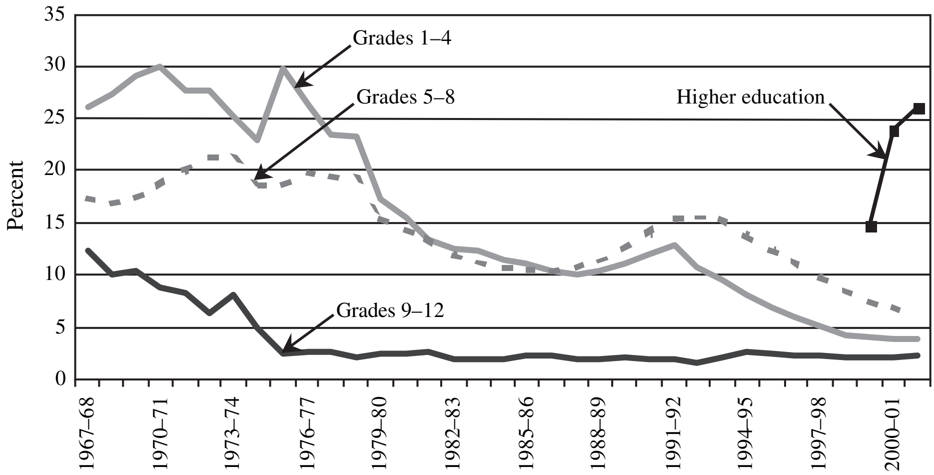
Enrollments in Government and Nongovernment Establishments

Schools in Ethiopia fall into two broad categories: government and nongovernment. Those in the first group charge little or no fees and they are managed and staffed by employees paid by the federal or regional governments. By contrast, institutions in the nongovernment sector rely partly or wholly on nongovernment sources of financing (for example, contributions by communities and student fees), and they are managed privately.[21]

Figure 2.4 shows trends since 1967–68 in the share of enrollments in nongovernment primary and secondary schools, and in nongovernment postsecondary institutions since

21. Nongovernment schools in Ethiopia include the following: (a) *public schools,* found mainly in Addis Ababa Municipality and Oromiya Region; most of these schools started off as private schools but were taken over by the government at various times and subsequently denationalized (in Addis Ababa, the schools depend to varying degrees on the government to pay the salaries of their teachers, while in Oromiya, public schools are financed by community contributions in the form of cash, materials, and labor); (b) *community schools,* schools that serve foreign communities and are managed by the relevant communities and financed by student fees; (c) *mission schools,* run by religious bodies and financed by school fees; and (d) *private schools,* operated by private entrepreneurs that rely entirely on student fees to cover operating costs and generate a profit for the owner.

Figure 2.4. Share of Students in Nongovernment Establishments, Ethiopia, 1967–68 to 2001–02



Note: Data for higher education available only from 1999–2000 onward; enrollments at all levels exclude students in evening, part-time, and summer courses.

Source: Govt. of Ethiopia various years, Education Statistics Annual Abstract.

1999–2000. Although nongovernment schools served three times as many students in grades 1–12 in 2000–01 as they did in 1967–68, their share of total enrollments fell from 24 percent to only 4 percent over this period. In grades 1–8, the decline started in earnest around the early 1980s (following an explicit policy in 1975–76 to nationalize all schools). It was reversed for about five years between the late 1980s and the early 1990s, a period of political turbulence in Ethiopia during which total enrollments fell in absolute terms. Since around 1991–93, the decline in the nongovernment sector's share resumed, reflecting the impact of the large-scale expansion of government schools under the new government's first education sector development plan.

In grades 9–12, the nongovernment sector's share of enrollments had already started to decline in the 1960s. By 1975–76, barely 2 percent of secondary students attended a non-government school, and the modest share has persisted to this day. In higher education, enrollments in the private sector have grown very rapidly in recent years: from 5,472 students or 15 percent of total enrollments in regular programs in 1999–2000, to 12,269 or 26 percent of total regular enrollments by 2001–2002.

Taken together, the trends in primary and secondary education point unmistakably to sustained efforts by various governments to expand formal education through direct service delivery in the government sector. In higher education, the explosion in enrollments in private institutions suggests that the latent demand for services has always been strong and only with the easing of constraints on private providers in recent years is such demand being met.

Evening Classes, Distance Education, and Nonformal Basic Education

Besides the regular daytime programs, a diversity of other educational options are available. Most students pursuing these options either pay out-of-pocket to receive instruction or rely on nongovernment organizations for subsidized services.[22] Below we describe the characteristics and size of enrollments in evening classes, distance education, and nonformal basic child and adult education. The data imply that fee-paying students in Ethiopia make up a larger share of the total enrollments than is implied by the data for daytime programs only, and the difference is especially large at the tertiary level.

Evening Classes

These classes offer instruction at all levels but are available mainly in urban areas because electric power for lighting is still largely confined to towns and cities. Financed entirely by student fees, the classes may meet in government or nongovernment premises. Those using government facilities are typically staffed by teachers and other personnel with daytime jobs in the same school,[23] while those meeting in nongovernment facilities presumably draw on more diverse sources for their staff. The curricula for evening courses prepare students for the same end-of-cycle examinations as students in regular programs; however, they are designed to cover the material over a longer period because students inevitably attend fewer hours of instruction at each class than students in the regular programs.[24] In 2001–02, some 162,000 students attended evening classes in grades 1–8, 80,000 in grades 9–12, and nearly 45,000 in higher education (Table 2.2). About 37 percent of the students in the primary grades attended classes in nongovernment facilities, but the share was only 3 percent at the secondary level and 15 percent in higher education.

Distance Education

Distance programs at the secondary level have been offered by the Educational Media Agency since 1971, but they reach relatively few people—around 1,000 students in 2001–02. In higher education, distance courses have also become popular in recent years, but the numbers enrolled are not known. *Kiremt* courses offered by universities and colleges are yet another option. Their main clientele were teachers, numbering just over 9,000

22. Exceptions are students in teacher training courses offered in the summer; such students are typically sponsored by the regional governments.

23. In 2002–03, fees from students ranged between Birr 6 to 15 per month in the primary grades and Birr 19 per month in the secondary grades. Fees in higher education vary across fields of study. According to government stipulation, the school hosting the classes is entitled to receive 11 percent of the fees collected from its evening students; the remaining 89 percent is used to pay the teachers. A parent-teacher committee associated with the day program of the school decides on how this income is used.

24. The curriculum in grades 1–8 is taught at the same pace as in regular daytime classes, but those for grades 9–10 and grades 11–12 cover the material over a period of three years instead of two years in the regular classes. In higher education, the duration of studies is also longer but its precise length varies across fields and by level of study. On average, students in the evening and summer courses take 1.5 times as long to complete their studies as daytime students.

Table 2.2. Number of Students by Type and Level of Education, Ethiopia, 2001–02

Type of student	Primary cycle: Grades 1–4	Primary cycle: Grades 5–8	Primary cycle: Total	Secondary cycle (grades 9–12)	Higher education[a/]	Adult education
Regular daytime students						
Total	5,725,954	2,256,806	7,982,760	684,630	48,143	0
In nongovernment establishments	229,265	140,050	369,315	15,667	12,619	0
Nongovernment share (%)	4	6	5	2	26	n.a.
Evening students						
Total	87,863	73,714	161,577	80,011	44,567	0
In nongovernment establishments	33,806	26,145	59,951	2,695	6,472	0
Nongovernment share (%)	38	35	37	3	15	n.a.
Students in distance education	0	0	0	1,080	—	0
Students in *Kiremt* courses[b/]	0	0	0	0	9,119	0
Students in nonformal education[c/]	~500,000	0	~500,000	0	0	~500,000
Grand total (thousands)	**6,314**	**2,331**	**8,644**	**766**	**102**	**~500**

(*continued*)

Table 2.2. Number of Students by Type and Level of Education, Ethiopia, 2001–02 (*Continued*)

	Primary cycle			Secondary cycle (grades 9–12)	Higher education[a]	Adult education
	Grades 1–4	Grades 5–8	Total			
Memoranda[d]:						
Percentage of students in regular daytime classes	91	97	92	89–93	47–57	n.a.
Percentage of fee-paying students	5	9	6	} 9–13	} 0–56	} ~100
Percentage of students not financed by government[e]	13	9	12			

—No data available; n.a. not applicable.

a. Includes diploma-level teacher training.

b. Refers to summer courses mainly for trainee teachers seeking a diploma-level certification.

c. Participants in nonformal education are divided into two groups, those aged 7–14 and those aged 15 and older. The younger group follows a curriculum that allows transfers to the formal system and is therefore classified here under the primary cycle in grades 1–4. Participants in the older group are grouped under adult education to correspond to the intent and content of the courses. The total is a rough estimate based on data between 1997–98 and 2001–02; see Appendix Table A2.2 for additional details.

d. The ranges shown for secondary and higher education correspond to alternative assumptions in adding up enrollments in the various types of programs. For the first figure in each range, enrollments are computed by simple addition across all types of programs; for the second figure, they are added after converting enrollments in evening, *Kiremt,* and distance courses to regular daytime equivalents on the assumption that students in such programs take 1.5 times as long to complete their studies as regular daytime students. For nonformal basic education, a similar calculation is not attempted because while pupils in the well-organized programs complete their studies in three instead of the four years in formal primary schools, the arrangement is not uniform across the country, and pupils in some of the less well-organized programs may in fact take longer or even fail ever to reach grade equivalency with the formal program.

e. Includes fee-paying students.

Source: Govt. of Ethiopia 2002a; supplemented by IIZ/DVV-ETH various issues, for data on nonformal education; and Govt. of Ethiopia 1994 E.C., for data on distance education.

in 2001–02, who attended under sponsorship by regional governments to upgrade their formal qualification.

Nonformal Education

This option, sometimes referred to as Alternative Basic Education, is especially important in rural communities. Available to both adults and children and financed largely by nongovernment organizations, including international ones (for example, Action Aid and Save the Children) or local agencies dependent on foreign sources of funding (for example, Rift Valley Children and Women Development Association), nonformal education programs may be managed directly by the funding organization or in collaboration with the regional governments. While not all nonformal education programs share a common curriculum across localities, they have a common aim: imparting basic literacy and numeracy. Adults in these programs often benefit from job-related skills training as well. The programs for children (clients below age 15) typically offer three levels of instruction that, in aggregate, match the first cycle of primary schooling (grades 1–4). Focusing mainly on the core subjects of languages (typically the local language and English) and mathematics, the programs are staffed by teachers living in the community who may or may not be paid.[25] Classes meet in structures built by the villagers or donated by a local benefactor, and the school calendar and hours of instruction are deliberately arranged to free children for work on the family farm or at home. At their best, the programs succeed in qualifying their pupils for transfer to the formal schools at the fifth grade after only three years of instruction (Govt. of Ethiopia 2002). Performance is not uniformly good, however, because of funding and other constraints. Indeed, in the most poorly funded centers, the programs offer what can at best be described only as informal instruction.[26] In the late 1990s and early 2000s, nonformal education served an estimated 1 million people, more or less evenly divided between adults and children below the age of 15.

Summary and Cross-Country Comparisons

The information presented above describes an education system with diverse, if uneven, options. About 90 percent of primary and secondary students attend regular daytime programs at present; the share in higher education is much smaller, between 47 and 57 percent. Because the government finances only the regular daytime programs in government schools, it is easy to deduce the share of students who either pay fees for their schooling or depend on nongovernment organizations to defray the costs. In primary education, the share is currently

25. In Oromiya Region, unpaid volunteers earn five points for each year of service in nonformal programs. These points count toward their score on a set of criteria the regional government uses to evaluate applicants for the coveted places in teacher training programs; the programs qualify successful candidates for teaching positions in government primary schools.

26. In one center the authors of this study visited, instruction was offered in a room made available by a resident but the class was cancelled for the day because the owner forgot to unlock the door. In another center, the teacher was a boy from the village who was attending eighth grade in a formal primary school some distance from the village.

12 percent (counting pupils in nonformal education); the pupils are evenly split between those who pay out-of-pocket and those who rely on nongovernment organizations. In secondary education, the share of fee-paying students rises to between 9 and 13 percent, depending on how enrollments in nonregular programs are treated. In higher education, such students account for between 50 and 56 percent of total enrollments. At all levels, the share of students who rely on sources of financing other than the government is thus much higher than what would have been implied by data for the regular daytime programs only. Also noteworthy is that in secondary and higher education, most of the fee-paying students attend evening classes taught by teachers from the daytime programs. In some ways, persistent constraints on private education in the past have simply given rise to what amounts to a private system within the public sector.

Figure 2.5 puts into cross-country perspective the extent of privately financed education in Ethiopia at the primary and secondary levels.[27] At 12 percent (with enrollments in nonformal basic education included), Ethiopia's share at the primary level exceeds that in most of the countries at a comparable level of per capita GDP in the figure. At the secondary level, the share is similar to that in a cluster of countries at Ethiopia's level of per capita GDP (Benin, Chad, Malawi, Mali, Mozambique, and Niger), but it is much smaller than the shares of about 50 percent in Madagascar, Rwanda, and Tanzania, and 30 percent in Burkina Faso—countries with per capita GDP in the $500 to $1,200 range (in PPP dollar terms).[28]

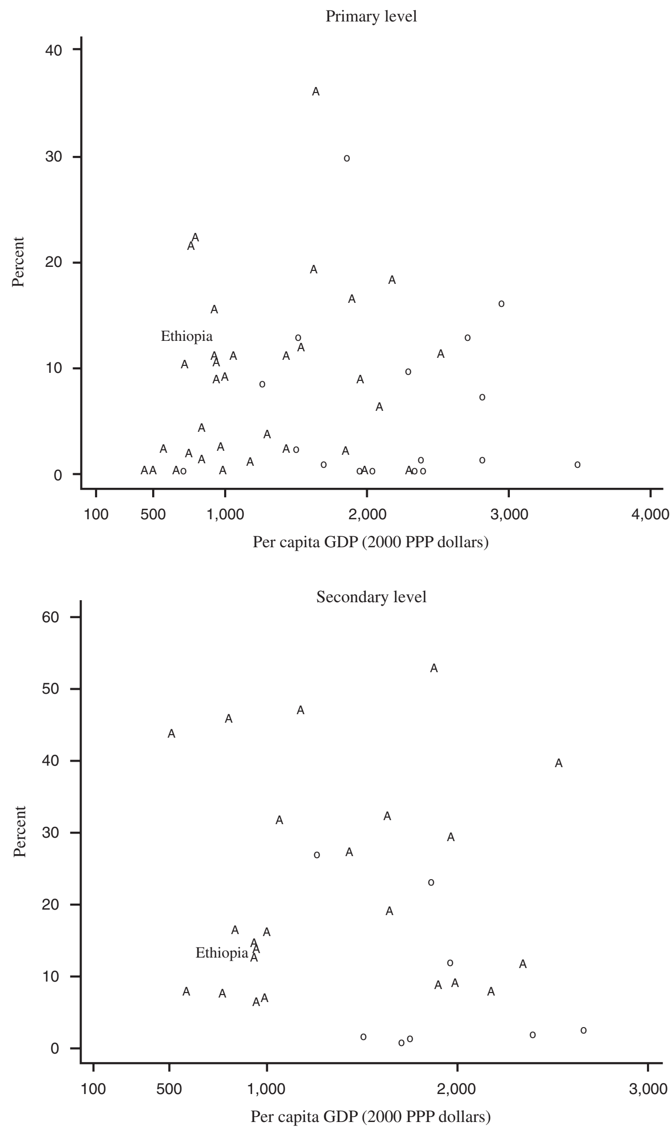
For higher education, the available data—presented in Figure 2.6—pertain mainly to countries at higher levels of per capita GDP than Ethiopia. What they reveal is the great diversity across both middle-income and OECD countries in the role of privately financed tertiary education. Among middle-income countries, the share of fee-paying students ranges from 5 percent in the Russian Federation, to 85 percent in Indonesia, and 74 percent in the Philippines; and among OECD countries, from 1 percent in Sweden, to 80 percent in Korea, and 79 percent in Japan.[29] The corresponding share in Ethiopia in 2001–02 was between 50 and 56 percent, which is higher than in most countries in the figure. Nevertheless, it could go higher by the standard in such countries as Brazil, Chile, Indonesia, Japan, the Philippines, and Republic of Korea—countries where basic education has historically received top priority in the allocation of public expenditure on education.

27. For primary education, the data for countries other than Ethiopia come from Bruns, Mingat, and Rakotomalala 2003, in which privately financed students exclude those who attend private schools subsidized by the government. The data for secondary education come from the UNESCO Institute of Statistics (UIS), which unfortunately makes no distinction between students in self-financing private schools and those in private schools subsidized by the government.

28. For a group of 18 middle-income non-OECD countries participating in UNESCO's World Education Indicators (WEI) Programme, the share of students in independent private institutions in 2002 averaged 9.5 percent at the lower secondary level, and 13.0 percent at the upper secondary level. Ethiopia's overall average for secondary education is comparable to these shares.

29. According to UNESCO-UIS/OECD (2001) the precise definition is the share of students in independent private institutions. Because fees are the main source of income in most of these institutions, we equate this statistic with the share of fee-paying students.

Figure 2.5. Share of Fee-Paying or Nongovernment-Financed Students in Primary and Secondary Education, Ethiopia and Other Countries, circa 2000

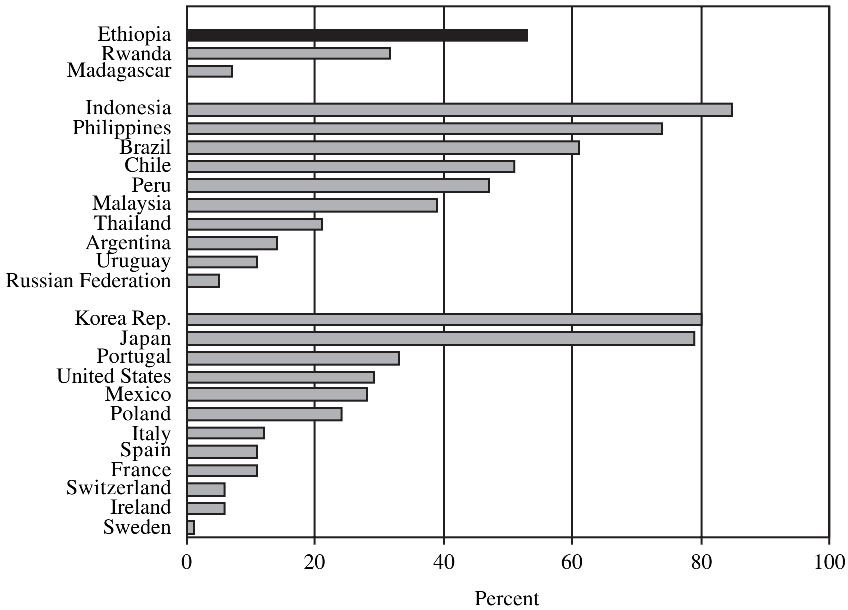


GDP gross domestic product; PPP purchasing power parity.

Note: The symbol "A" denotes an African country, while "o" denotes a non-African country; data for Ethiopia include enrollments in evening and nonformal programs (see text for further details).

Source: For share in Ethiopia, table 2.2; for share at the primary level in other countries, Bruns, Mingat, and Rakotomalalala 2003; for share at the secondary level in other countries, UNESCO Institute of Statistics, as reported in the World Bank's EdStats database at <www.worldbank.org/education/edstats>; for data on per capita GDP in PPP dollar terms, *World Development Indicators* 2003 (2003a).

Figure 2.6. Share of Privately Financed Tertiary Students, Ethiopia, 2001, and Other Countries, 1999



Note: The middle block includes countries participating in UNESCO's World Education Indicators (WEI) Programme in which detailed data are collected on education finance; the second block includes OECD countries for which the relevant data are available.

Source: For Ethiopia, table 2.2; for Madagascar, World Bank 2002; for Rwanda, World Bank 2003b; for the other countries, UIS/OECD 2001.

Trends and Levels in the Gross Enrollment Ratio

This section documents the coverage of the system as depicted by the gross enrollment ratio (GER), which is defined as the ratio between all students enrolled in a given cycle and the population in the official age range for that cycle.[30] While flawed as a measure of coverage, this statistic is easily computed, and data are available for a large number of countries.[31] Other indicators of coverage that more closely reflect the dynamics of student flow will be presented in a later section of the chapter.

30. In Ethiopia the age range for primary schooling is 7–14 years and for secondary schooling, 15–18 years. For higher education, the standard practice is to define the age range as the five-year bracket following the last year of the range for secondary schooling (ages 19–23 in the case of Ethiopia).

31. The GER is often supplemented by the net enrollment ratio (NER), which is computed in the same way as the GER, except that the numerator includes only students in the official age range for the cycle of schooling concerned. Both measures are flawed because they refer to the volume of enrollments (calibrated against population size) rather than to the dynamics of student flow. Because of the way it is defined, the NER is especially problematic as a measure of coverage in postprimary cycles of education. This is because the cumulative effects of late entry to first grade, grade repetition, and interrupted studies inevitably mean that significant numbers of students must be excluded in computing the NER; this results in systematic underestimation of the true reach of the education system.

Primary Education

Table 2.3 shows trends in the GER computed from two sources of data: (a) the administrative statistics collected by the Ministry of Education through its annual school census and population projections supplied by the Central Statistics Authority; and (b) household surveys. The survey-based GERs are generally higher, particularly in the earlier years, but the discrepancy is not large. Looking over time, we see that the rapid increase in enrollments between 1993–94 and 2001–02 is reflected in a tripling of the GER, from 20 to 62 percent. This remarkable achievement notwithstanding, Ethiopia's GER remains modest in cross-country comparison. This is evidenced in Figure 2.7 where the statistic for Ethiopia has been reestimated for six years of schooling to match the corresponding statistic for all the other countries shown in the figure. The adjusted GER of 68 percent puts Ethiopia only slightly ahead of such countries as the Democratic Republic of the Congo, Guinea, Sierra Leone, and Sudan. Because the GER provides a measure of the availability of school places relative to the *potential* demand for schooling, the result for Ethiopia implies that even in the absence of repeaters who inevitably take up

Table 2.3. Primary Gross Enrollment Ratios (GER), Ethiopia, 1993–94 to 2001–02

School year	Based on school census and government population estimates[a/]	Based on school census and	
		GER Estimate	Survey and data collection period[b/]
1993–94	20.5	—	
1994–95	26.2	—	
1995–96	30.1	34.0	WMS, Jan./Feb. 1996
1996–97	34.7	—	
1997–98	41.6	45.8	WMS, March/April 1998
1998–99	45.8	41.3	LFS, May 1999
1999–00	51.0	53.9	WMS, Jan./Feb. 2000
		51.6	DHS, Feb./May 2000
2000–01	57.4	—	
2001–02	61.6	—	

—Estimate not available in the absence of a survey

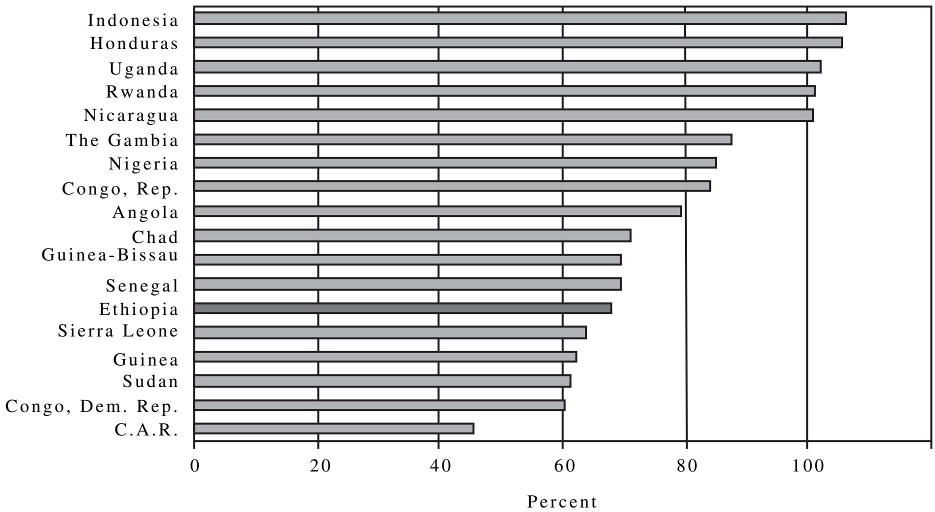
Note: The gross enrollment ratio (GER) in this table refers to grades 1–8.

a. For 2000–01 and 2001–02, the GER includes evening students in the numerator (which was augmented as a result by 1.2 percent); the increase would have been much larger if children in nonformal basic child education programs were also included. In this case, the GER would have risen to 61.2 percent in 2000–01 and 65.6 percent in 2001–02, assuming that the share of students in regular day programs is 92 percent, the estimate reported in Table 2.1.

b. The household surveys are the following: WMS, Welfare Monitoring Survey; LFS, Labor Force Survey; DHS, Demographic and Health Survey. The Child Labor Force Survey conducted in March 2001 could have extended the series based on household surveys, but the data files were unavailable at the time of data analysis for this study.

Source: Govt. of Ethiopia 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, for data on gross enrollment ratios based on school census and population projections; and authors' calculations for the survey-based estimates.

Figure 2.7. Primary Gross Enrollment Ratio (GER), Ethiopia and Other Countries, circa 2000



C.A.R., Central African Republic; Congo, Dem.Rep., Democratic Republic of the Congo; Congo, Republic of Congo.

Note: The GER has been standardized for six years of primary schooling for all countries in this figure.

Source: For Ethiopia, computed from Ministry of Education data on enrollments in grades 1–6 and on the population ages 7–12; for other countries, Mingat, Rakotomalala, and Tan 2002.

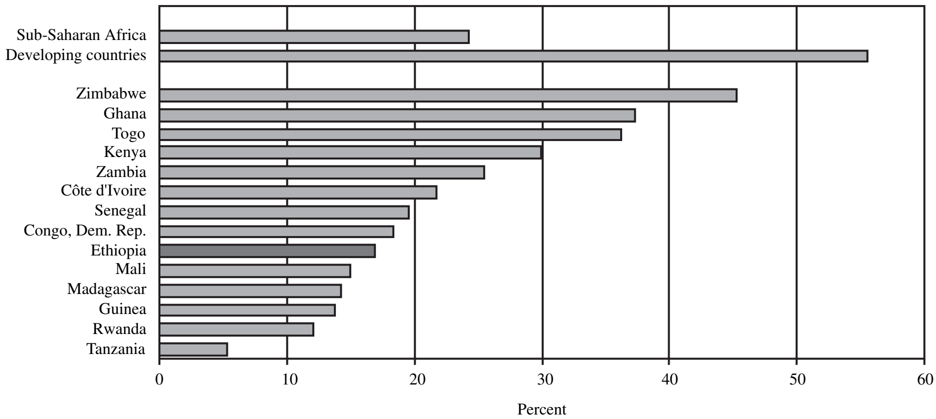
extra space, new classrooms will continue to be needed in the foreseeable future as the country strives to achieve universal primary school completion.[32]

Secondary Education

In contrast to the sharp rise in the primary GER between 1993–94 and 2001–02, the ratio for secondary education rose only marginally during this period, from 8 percent to 12 percent (or 13 percent if evening students are included; nearly 14 percent if students in technical and vocational education and training are included). For cross-country comparisons, Ethiopia's statistic again needs to be adjusted because secondary schooling lasts only four years in the country compared with the more common structure of 6–7 years in most other countries. In Figure 2.8, the GER for Ethiopia is computed for grades 7–12. At nearly 17 percent, the adjusted GER is smaller than the average of 24 percent for Sub-Saharan Africa, and far below the average of 56 percent in developing countries as a whole. Still, Ethiopia's figure is more than three times as high as Tanzania's 5 percent,

32. As will become clear in Chapter 5, management of the country's currently high construction costs is an important concern in light of the magnitude of the potential demand for new classrooms.

Figure 2.8. Secondary Gross Enrollment Ratio (GER), Ethiopia, Selected African Countries and Country Group Averages, circa 2000



Congo, Dem. Rep. Democratic Republic of the Congo.

Note: Country group averages are population weighted; to improve cross-country comparability, the ratio for Ethiopia refers to grades 7–12.

Source: For Ethiopia, computed by authors from Ministry of Education data on enrollments and population, ages 13–18; for the other countries and country groups, UNESCO 2002.

and somewhat greater than the ratios for Guinea, Madagascar, Mali, and Rwanda—all countries with higher levels of per capita GDP in 2000.

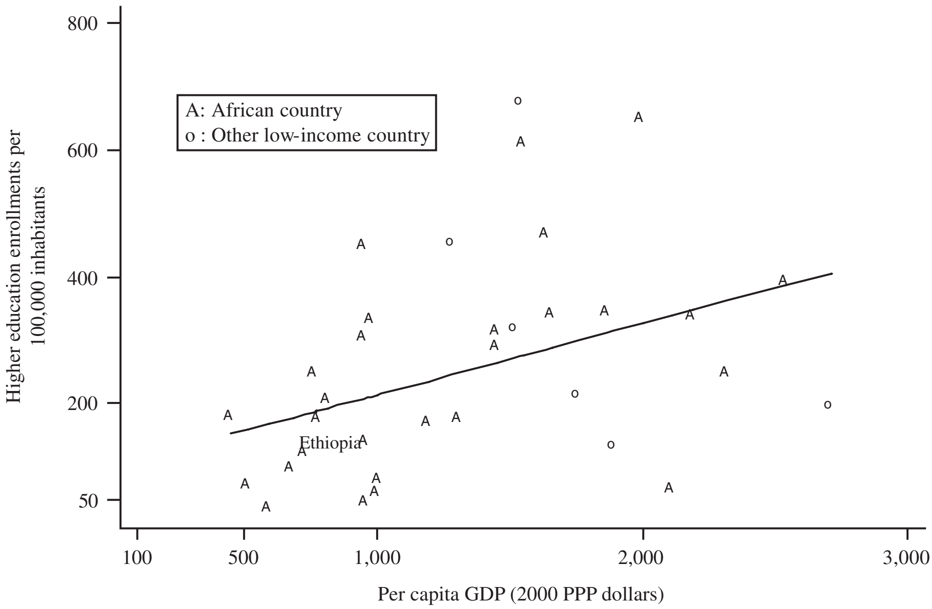
Higher Education

At this level of education, the discrepancy between the ages of the enrolled and reference populations tends to be even wider than at the lower levels of schooling.[33] Thus, in addition to the GER, some analysts also rely on the number of students per 100,000 population as a measure of coverage at this level of education.

We examine first the GER. It rose from 0.5 percent in 1993–94 to 1.7 percent in 2001–02, reflecting the sharp rise in enrollments after the mid-1990s. The country's ratio nonetheless remains one of the lowest worldwide, ranking ahead of only a few low-income countries that include Angola, Chad, Mozambique, and Tanzania. The picture remains unchanged when the other statistic—higher education students per 100,000 inhabitants—is used (Figure 2.9). Ethiopia's statistic in 2001–02 is estimated at between 125 and 150 students per 100,000 inhabitants—clearly below the nearly 200 students per 100,000 predicted from regression analysis for a country at a similar level of gross domestic product per capita.

33. The gap between the two populations reflects the effect not only of late entry and grade repetition earlier in the system, but also the likelihood that many secondary school graduates will work for a few years before enrolling in higher education.

Figure 2.9. Relation between GDP Per Capita and Coverage in Higher Education in Low-Income Countries, circa 2000



Note: GDP, gross domestic product; PPP, purchasing power parity; data for Ethiopia refer to 2001–02 and include students in evening and *Kiremt* courses, adjusted to full-time equivalents, assuming that such students take 1.5 times as long to complete their studies as those in regular programs (see table 2.2 for additional details).

Source: Ethiopia higher education enrollment data, Education Management Information System (EMIS) Panel of the Ministry of Education; all other data, World Bank SIMA database.

It is important to caution that even though these cross-country comparisons seem to suggest a possible need for catch-up expansion of higher education, a convincing justification must rest on direct evidence of market demand. At this level of education, such evidence needs to confirm that graduates are indeed landing jobs appropriate to their training and are also earning good returns on their education. Just as important is the fact that even if expansion were justified on these terms, there is no prima facie case for expansion through the public sector alone. In light of the government's fiscal constraints, a continued large role for the private sector, encouraged by the government in recent years, may be the only fiscally viable and sustainable way to expand coverage while also ensuring responsiveness to the demand for highly educated workers.

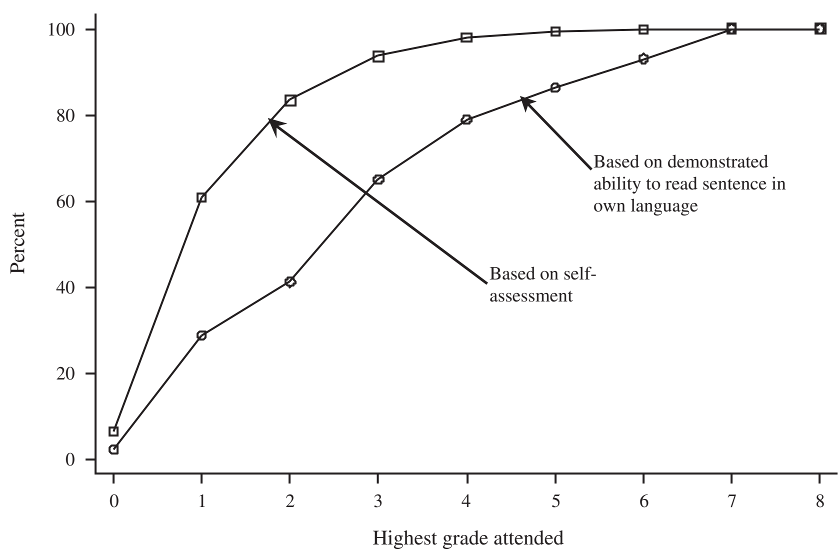
Student Flow in Primary and Secondary Education

Because schooling requires a multiyear commitment in order to yield the hoped-for results, it is important to go beyond the gross enrollment ratio to examine the dynamics of student flow, as documented by such indicators as rates of entry, survival, completion, repetition, and transition between cycles. At the primary level, where the curriculum typically aims to impart basic literacy and numeracy skills, children who never enroll are unlikely to acquire these skills, and those who enroll but drop out prematurely are also unlikely to become permanently literate and numerate. At the postprimary levels, access and survival to the end of the cycle remain important, not least because both are prerequisites for entry to subsequent levels. The curricula likewise offer training in an integrated set of skills, so that premature exit would imply a frustrated investment. To set the stage for our discussion on student flow, we begin below with a brief presentation of the link between schooling attainment and adult literacy.

Years of Schooling Completed and Adult Literacy

Data from a 2000 household survey confirm the expected positive relation between educational attainment and literacy: the probability of being literate, objectively measured by a demonstrated ability to read a written sentence in the respondents' own language, is 100 percent for those with seven or eight years of primary schooling and falls to 80 percent for those with only four years (Figure 2.10).[34] While these results compare well with those of other African countries (see appendix Figure A2.1), it is to be recalled that they pertain to adults who were in school when the system was much smaller (when it served the country's elite) and classroom conditions better (for example, the pupil-teacher ratio

Figure 2.10. Percentage Literate among Adults Ages 15–49, by Highest Grade Attended, Ethiopia, 2000



Source: Estimated from the 2000 Ethiopia Demographic and Health Survey.

34. A unique feature of the Ethiopian data is that it contained both a subjective and an objective measure of literacy. As Figure 2.10 shows, the subjective measure yields a more optimistic result, reflecting an understandable bias in all self-evaluation.

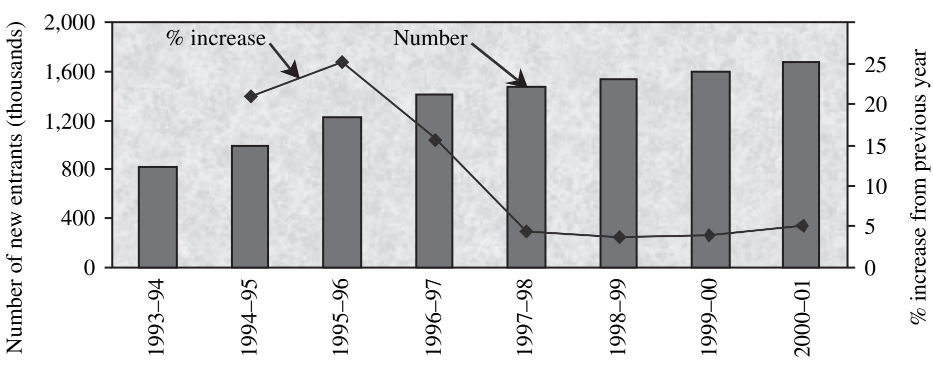
averaged 32 in 1993–94, compared with 65 in 2001–02). The view that performance has probably deteriorated is consistent with the results of a recent small-scale assessment of student learning, which showed that fourth-graders across the country correctly answered fewer than half of the items on which they were tested (Keder and others 2001; Hassen and others 2001b).

The foregoing results have important implications for how we examine the pattern of student flow. Although the country's primary cycle currently lasts eight years, divided into two subcycles of equal duration, it would appear that completion of the first cycle may be insufficient to ensure that most children achieve permanent literacy (given the probable deterioration in schooling conditions discussed earlier). However, completion of eight years may go beyond what is minimally required. A noteworthy fact is that Ethiopia is one of only 47 among 194 developing countries worldwide in which primary schooling lasts more than six years. As countries develop economically, many do indeed set themselves the goal of ensuring that all children complete eight or nine years of basic education (usually combining what are labeled the primary and lower secondary cycles). Such a goal is undoubtedly also appropriate for Ethiopia in the long run, but in the short term, resource constraints are likely to present difficult tradeoffs between the duration of basic education and the number of children who can be accommodated. Assessing the fiscal implications of the current eight-year cycle compared with, say, a five- or six-year cycle, will therefore be important in informing future policy development.

Entry to Grade 1

Growth in the number of children entering grade 1 was the main reason for the spectacular gains in primary school enrollments since 1993–94. The gains were largest between 1994–95 and 1996–97: each school year saw the number of new entrants exceed those in the previous year by some 20, 26, and 15 percent, respectively (Figure 2.11), or by about

Figure 2.11. New Entrants to Grade 1 and Percentage Increase from Previous Year, Ethiopia, 1993–94 to 2000–01



Note: Includes only regular pupils.

Source: New entrants are computed by subtracting repeaters from total enrollments in Grade 1, data for which are reported in Govt. of Ethiopia various years, Education Statistics Annual Abstracts.

200,000 children in absolute terms. The number of new entrants has continued to grow since 1996–97, but at the slower pace of just 4 percent each year.

One way to put the growth in enrollments in perspective is to relate the number of new entrants to the 7-year-old population, 7 being the official age of entry to grade 1. This indicator—called the apparent intake rate—climbed from 45 percent in 1993–94 to nearly 100 percent by 2000–01 (Table 2.4). While the increase is undoubtedly spectacular, it by no means implies that all children are now entering school. In a system such as Ethiopia's where rapid growth had been occurring since only 1993–94, new entrants to grade 1 typically included children who were entering on time, as well as older children who would have started at an earlier age had there been a school in the locality at the time they were ready to start. In other words, the numerator in the apparent intake rate contains a cross-section of children from several cohorts. Thus, when it is related to the population in a single age cohort, the result tends to overstate the share of children in a cohort who would ever enter grade 1.

A better estimate of the cohort rate of entry to grade 1 is the share of children who have ever been to school by a certain age. Typically, the share rises with age and then flattens out or declines slightly after age 13 or so (see Table A2.3 for the pattern in Ethiopia). This pattern

Table 2.4. Three Indicators of Entry to Grade 1, Ethiopia, 1993–94 to 2000–01

Year	Apparent intake rate (AIR, %)[a/]	Cohort entry rate (CER, %)[b/]	Ratio of AIR to CER	Percentage of children ever enrolled by age 7
1993–94	45.2	—	—	—
1994–95	55.8	—	—	—
1995–96	71.3	37.2	1.9	12.6
1996–97	80.6	—	—	—
1997–98	90.5	44.6	2.0	17.3
1998–99	92.9	54.5	1.7	21.9
1999–00	95.7	52.4	1.8	20.6
2000–01	99.5	60.5	1.6	—

—Data not available.
a. Defined as the number of new entrants to grade 1, regardless of age, relative to the population of 7-year-olds; data exclude evening students.
b. Refers to the estimated share in a cohort who ever entered school. The rates are estimated from data for sampled youths ages 7–18 in the Welfare Monitoring Surveys of 1996, 1998, and 2000; youths ages 7–14 in the 1999 Labor Force Survey; and youths ages 7–17 in the 2001 Child Labor Force Survey. Because the percentage ever enrolled tends to peak by ages 13–14, it provides a reasonably good estimate of the share of children in a cohort who would ever enroll. For 1995–96 and 1997–98, the peak occurs slightly later, so the data shown in the table correspond to the percentage ever enrolled by ages 15–16 and 14–15, respectively (see Table A2.3).
Source: For the apparent intake rate: computed from data on enrollments and repeaters reported in Govt. of Ethiopia 1995, 1996, 1997, 1998, 1999, 2000, and 2001, and projections of the 7-year-old population prepared by the Central Statistical Authority of Ethiopia; for percentage ever enrolled in a cohort of children: computed from the Welfare Monitoring Surveys of 1996, 1998, and 2000, and the 1999 Labor Force Survey, and for 2000–01, from Table 3.12 in Govt. of Ethiopia 2002, which is based on the Child Labor Force Survey fielded in March 2001.

implies that children who have never been to school by age 13 are unlikely ever to do so. We can therefore use the share of children who have ever entered by this age as an estimate of the cohort entry rate to grade 1.[35] The results, based on data from several national household surveys, show a steady rise in the cohort entry rate, from 37.2 percent in 1995–96, to 60.5 percent in 2000–01. The gain is indeed very substantial, particularly because it occurred over a relatively short period; yet the fact remains that entry to grade 1 is still far from universal, and is much below the average of 75 percent among subsaharan African countries.[36] By comparing the apparent and cohort entry rates to grade 1, we clearly see that the entrants to grade 1 over the past few years consist of a large number of older children who were responding to newly available schooling opportunities. As the backlog of such children is cleared, this multiple cohort effect will inevitably dissipate. Consistent with this expectation, the share of children who enter grade 1 by age 7—the official (and probably desired) age of entry—has been rising steadily; it nonetheless remains modest, just over 20 percent.

Survival Rates

Cohort survival rates are conceptually easy to understand: they are the share of entrants to a given cycle of education who eventually reach a subsequent grade. In the 4-4-2-2 structure of Ethiopia's education system, the relevant survival rates are between grades 1 and 4, between grades 5 and 8, between grades 9 and 10, and between grades 11 and 12. Survival rates between grades 1 and 8 and between grades 1 and 12 provide additional perspective, while those between grades 1 and 5 have become increasingly relevant in the context of the Millennium Development Goals. Because Ethiopia's education system is at an early stage of development, survival rates in the primary grades are of particular interest, and the discussion below will focus on them.

Data and Estimation Methods. To clarify the discussion, it is useful to begin with a brief comment on how survival rates are estimated.[37] One method involves the use of longitudinal data to trace students' schooling career over time. It is not often used, however, because: (a) such data are typically unavailable; and (b) the results are dated because they refer to students who have already completed their schooling up to a given grade, rather than to those currently going through the system. Instead, survival rates are more usually estimated using cross-sectional data. Below we present the results based on three methods of estimation. All of them are approximations of the phenomenon we wish to document, but the composite method would appear to provide the best compromise for our needs—it combines ease of computation, lightness of assumptions, and an ability to generate real-time estimates.

Estimates for Pseudo-cohorts. Assuming stable student flow patterns over time, this method calculates the survival rate between two grades, say, grades 1 and 4, as the ratio of the number

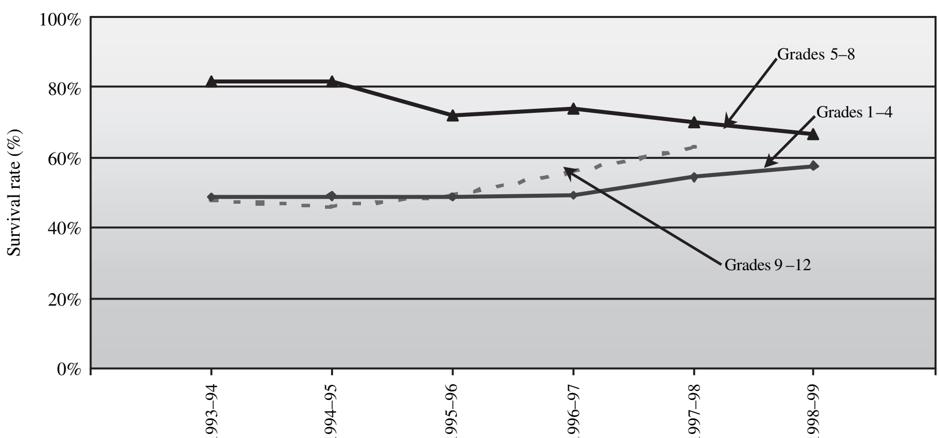
35. In Ethiopia, the share of children who have ever entered grade 1 peaked at slightly older ages in 1996 than in 2000. This pattern implies that in the earlier years, schools were indeed catering to a backlog of demand among older children that is now being satisfied at younger ages in the expanded system. Because we are interested in cohort entry rates, we used the peak rate in the age range 13–17, without necessarily choosing a specific age within the range.

36. The average is for 18 low-income countries.

37. A more detailed explanation can be found at the end of this report in the Technical Note 2 on estimating student flow profiles.

of nonrepeaters in grade 4 in year Y to the number of new entrants who started in grade 1 three years earlier, that is, in year Y–3. Since the data pertain to assumed rather than real cohorts, the method yields what we might call pseudo-cohort survival rates. The results for cohorts starting their schooling careers in 1993–94 to 1998–99 appear in Figure 2.12. During this period, survival rates improved slightly between grades 1 and 4 and between grades 9 and 12, but deteriorated between grades 5 and 8.[38] These patterns reflect the combined effect of underlying influences and their evolution: (a) the perceived benefits of schooling; (b) the age composition of the students (because of its implications for the opportunity costs of attending school); and (c) the quality of school services. The first factor appears to have counteracted the negative impact associated with the massive expansion of the system since 1993–94 and the unambiguous deterioration in services (as reflected, for example, in the rapidly rising pupil-teacher ratios during the period), as well as that associated with the large numbers of overage students among entrants in the early years. These patterns are an indirect confirmation that the demand for schooling during the past decade had indeed been reasonably strong. Nonetheless, a survival rate of barely 60 percent in the first cycle of primary schooling remains low. Efforts will obviously be needed to continue boosting the demand for schooling, and this will probably require a combination of interventions to lower the cost of schooling to families and to improve the quality of services.

Figure 2.12. Pseudo-Cohort Survival Rates in Primary and Secondary Education, Ethiopia, 1993–94 to 1998–99



Source: Technical note table T2.3.

Notice that because of data truncation, the survival rates pertain to children who started their schooling at least three years prior to the last year for which data are available. In a country where enrollments have been growing very rapidly, this drawback is

38. In theory we can apply the method to compute pseudo-cohort survival rates between grades 1 and 8, for example, but the latest year for which we could compute estimates would be 1994–95, seven years earlier than the latest year for which data were available.

unfortunate because it provides a less than up-to-date picture of the situation. For this reason, we turn below to the results from two other methods of estimation, which overcome this handicap.

Estimates for Reconstructed and Composite Cohorts. Again, the details of these methods can be found in the Technical Note 2. Briefly, the reconstructed cohort method employs grade-wise enrollment data for two consecutive years and repeater data for the later of the two years to compute promotion, repetition, and dropout rates in the first year. These rates are then applied to a fictive cohort of 1,000 students to simulate their grade-to-grade flow through the system. The composite cohort method uses the same data but does the calculation in two steps, first computing survival rates between adjacent grades by relating the number of nonrepeaters in grade X in year Y, to those in grade X–1 the year before; and then computing survival rates to a given grade by multiplying the relevant adjacent grade-to-grade survival rates. Effectively, this method provides a simulation of the survival rate in a hypothetical cohort that exhibits the same grade-to-grade transition patterns as currently observed in a cross-section of children in the various grades.

The results based on these two methods are shown in Table 2.5. The reconstructed method yields higher survival rates than the composite method, and the gap widens as the number of grades for which they are computed rises. This is not surprising since the former method involves repeating the algorithm of repetition and promotion in each grade for as many times as it takes for all members of the cohort to exit the grade, either through promotion to the next grade or through dropping out. The Ministry of Education makes a modified calculation in which the repetition algorithm is processed only twice per grade (to reflect the fact that under current rules, pupils are allowed to repeat a grade no more

Table 2.5. Cohort Survival Rates Using Different Estimation Methods, Ethiopia, 2000–01

Method	Grades 1 to 4	Grades 1 to 5	Grades 1 to 8
Classical reconstructed cohort method[a/]	0.64	0.60	0.47
Composite cohort method	0.60	0.53	0.36
Memorandum:			
Modified reconstructed method with repetition algorithm repeated only twice per grade[b/]	0.63	0.57	0.40

Note: Survival rates beyond grade 8 are not shown to avoid clutter in the table. For estimates, see Technical Note Figures T2.3 and T2.4 and Table T2.5.
a. The repetition algorithm is repeated in each grade until no repeaters are left.
b. As explained in Technical Note 2, the calculation is more properly described as a simulation in which the repetition rate among members of a cohort is, for the first two years, assumed to be the same as computed from the data; and in subsequent years, is assumed to be 0 as the members who would have repeated are treated as dropouts instead. Note that in this calculation readmitted students are treated as repeaters rather than dropouts (in contrast to the calculation done by the Ministry of Education); as a result, the estimate survival rate is higher than those reported by the Ministry in its Annual Statistical Abstract.
Source: Based on grade-specific data on enrollments and repeaters, and calculations shown in the Technical Note.

than twice); and as the table shows, the result is to reduce the survival rate.[39] In some ways, the calculation can be described as a simulation of survival rates under certain assumptions about repetition and dropout behavior; if pupils repeated fewer than twice before dropping out, the simulated survival rate would obviously fall further. The bootstrapping procedure is also a simulation; however, the grade-to-grade repetition and dropout rates are not assumed but simply incorporated as an intrinsic feature in the calculation. For this reason, and because the calculations are less tedious than those involved in the reconstructed cohort method, the discussion below and in subsequent chapters relies on survival rates computed using this method.

Table 2.6 compares the composite cohort survival rates for students enrolled in 1993–94, and circa 2000–01. The data show an unambiguous rise in the share of first-graders who complete the first four years of primary schooling, but the trends are less clear-cut regarding the share reaching subsequent grades, especially from grade 6 onward. Following a change in policy restricting access to grades 11 and 12, the share of students in 2001–02 reaching grade 12 has fallen to only 8 percent—a sharp decline indeed compared with the corresponding Figure of 15 percent among students enrolled in 1993–94. In cross-country comparison, Ethiopia's cohort survival rate to grade 6 lags behind those of other countries: 45 percent in 2001–02 compared with an average of 61 percent circa 2000 among 20 low-income sub-saharan countries for which a composite cohort survival rate could be computed.

Table 2.6. Composite Cohort Survival Rates and Intercycle Transition Rates, Ethiopia, 1993–94 and circa 2000–01

Indicator	1993–94	1999–00	2000–01	2001–02
Cohort survival rates from grade 1				
To grade 4	0.52	0.60	0.61	0.59
To grade 5	0.49	0.53	0.54	0.51
To grade 6	0.48	0.47	0.49	0.45
To grade 8	0.39	0.36	0.40	0.36
To grade 10	0.23	0.20	0.31	0.27
To grade 12	0.15	0.19	0.13	0.08
Intercycle cohort transition rates				
grades 4 & 5	0.94	0.88	0.90	0.88
grades 8 & 9	0.84	0.89	0.98	0.91
grades 10 & 11	0.86	—[a/]	0.34	0.33

Note: Survival rates and transition rates are computed from data for two adjacent school years, the first of which is indicated in each column in the table; see text and Appendix Table for more details. Shaded cells draw attention to the impact of policy changes implemented in 2000–01 to regulate student flow in grades 11 and 12.
a. Estimate exceeds unity, which is by definition inadmissible; it signals probable inaccuracies in the counts of repeaters and readmitted students as a new policy to regulate student flow in preparatory secondary education was implemented from 2001–02 on.
Source: See Technical Note Table T2.5.

39. The calculation prepared by the Ministry of Education is reported in its Annual Statistical Abstract.

The table also includes transition rates at three points in the system, corresponding to the system's 4-4-2-2 structure. There is no formal selection mechanism between grades 4 and 5, but students must pass a regional examination in grade 8 in order to reach grade 9, and a national examination in grade 10 in order to go on to grade 11. Until 1999–00, about 90 percent of tenth-graders proceeded to the next grade, but under a new policy introduced in 2000–01 to regulate student flow, only about a third of them do so now. At the other two selection points, the transition rates remain very high at around 90 percent. These patterns suggest that the bulk of selection up to grade 10 is mediated not by any formal selection mechanism, but by a steady loss of students through dropping out.

Completion Rates

As a concept, completion rates are again easy to understand: they measure the proportion of children who attain schooling of a given grade. Estimating them is another matter, however. To maximize shared understanding of this important indicator and to facilitate discussion on how best to monitor performance over time, we elaborate on two methods below, and suggest that the cohort method is probably more suited to the purpose at hand.

Cross-sectional Estimates. The simplest calculation is to divide the number of nonrepeaters at the grade of interest, by the population of the corresponding age for that grade.[40] Because of its simplicity and the relative ease of assembling the required data, this calculation has been made for a large number of countries in the context of background documents for the Education For All Fast Track Initiative (see, for example, Mingat, Rakotomalala, and Tan 2002; and Bruns, Mingat, and Rakotomalala 2003). By this method, Ethiopia's grade 6 completion rate is estimated at 24 percent in 1999–2000 (the figure cited in the foregoing publications) and 34 percent in 2001–02.[41] By contrast, the average primary completion rate was 58 percent for 54 low-income countries (excluding Ethiopia) around 2000.

While the above statistic facilitates comparisons across countries, the estimate for Ethiopia suffers from two problems associated with the rapid growth of the system in recent years. First, because of the large number of overage students currently in the system, the numerator in the completion rate pertains to a population that is inevitably older (and therefore smaller in size) than the population in the denominator. Second, the numerator includes students from several age cohorts while the denominator refers to only one age cohort. The effect of the first problem is to underestimate the completion rate, while that

40. Note that this calculation tends to underestimate the completion rate since the numerator includes students who may drop out in the course of the school year. The fact that Ethiopia's school census is conducted only one month after the start of the school year tends to increase the risk of overestimation. The alternative of using data for the next grade to make the calculation is also unsatisfactory: it is likely to underestimate completion rates to the extent that some of the students who complete a given grade may not go on to the next grade. Since the latter calculation does not offer a clear-cut advantage and may be confusing because it uses data for one grade to compute completion rates for the previous grade, we will follow standard practice in using the former definition.

41. Ethiopia's grade 6 completion rate was computed by dividing the nonrepeaters in this grade by the 12-year-old population, 12 being the sum of the official age at entry to grade 1 and the number of years between grade 6 and grade 1. A similar calculation for grade 5 yields a completion rate of 34 percent in 1999–2000 and 44 percent in 2001–02.

of the second is to overestimate it. We can minimize the first problem by ensuring consistency in the ages of the populations in the numerator and denominator. Making this adjustment using data from the 2000 Ethiopia Welfare Monitoring Survey—the latest available at this writing—yields a grade 6 completion rate of 42 percent[42]—a much higher figure than the unadjusted rate of 24 percent based on school census data and population projections for 1999–2000, the corresponding school year.

With regard to the second problem, however, there does not appear to be an obvious way to adjust the calculations. This handicap implies that the partially corrected completion rate of 42 percent in grade 6 (and 53 percent in grade 5) reported above is almost certainly an overestimate of what we wish to measure. Note, too, that because the overestimation arises from a transitory phenomenon that must dissipate as the backlog of unmet demand for schooling is satisfied, the partially adjusted completion rate can be expected to decline over time in the absence of changes in the underlying cohort entry and survival rates. Obviously we would expect the latter rates to improve, in which case the trend in the completion rate is likely to become unpredictable as the improvement is offset by the negative transitory effects.

Cohort Estimates. For monitoring trends in completion rates over time, we would need a statistic that is free from the transitory effects associated with the explosive expansion of the system in recent years. A simple approach is to multiply the cohort entry rate by the cohort survival rate to each grade in order to obtain the corresponding cohort completion rate. The completion rates thus computed show the proportion in a cohort of children that would attain each grade if current patterns of transition between adjacent grades remain unchanged.[43] Figure 2.13 shows the results for 1995–96 and 2001–02 obtained in this way, based on the cohort entry and composite survival rates reported earlier.[44] For comparison, the partially corrected completion rates based on cross-sectional data are also shown.

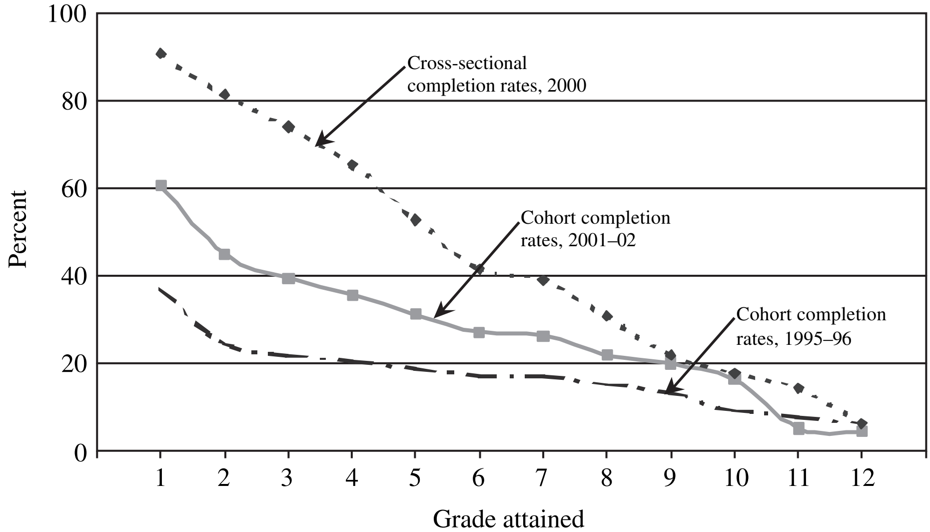
Several features are noteworthy in the figure. First, with regard to the results for around 2000, the cross-sectional completion rates exceed the cohort completion rate at each grade, the difference being especially large in the earlier grades. The pattern is consistent with our expectation that the multiple cohort effect would be smaller in the upper grades as older students in each grade are likely to leave the system sooner than their younger peers. Second, the cohort completion rate at each grade shows a clear improvement between 1995–96 and 2001–02; for example, the grade 5 completion rate rose from 19 to 31 percent during this period, while the grade 6 completion rose from 17 to 27 percent. Although rising entry and survival rates both contributed to the improvement, the former is by far the more important factor, having risen from around 37 percent to more than 60 percent during the period

42. The adjustments were made using data from the 2000 Welfare Monitoring Survey (which was fielded in January/February 2000 and whose data thus corresponded to those collected for school year 1999–2000). Because this survey provided information on enrollment status for individual children by age and grade, it was possible to evaluate the age of nonrepeaters in each grade and to relate the number to the population of the corresponding age cohort (after smoothing the distribution to correct for the effects of age heaping in the reported data).

43. As mentioned above, the cohort survival rate can be computed using the reconstructed cohort method or the composite cohort method. For reasons explained earlier, we will use the survival rates computed using the second method to derive the completion rates.

44. Because no survey data are available to estimate cohort entry rates for 2001–02, we used the cohort entry rates estimated from survey data for 2000.

Figure 2.13. Grade-Specific Completion Rates, Ethiopia, 1995–96 and circa 2000



Source: For the cross-sectional completion rates, authors' analysis of data from the 2000 Ethiopia Welfare Monitoring Survey; for the composite cohort survival rates, computed by multiplying cohort entry rates in table A2.2 and the composite cohort survival rates in technical note table T2.5, with results shown in table A2.3.

(a gain of 63 percent); survival rates to each subsequent grade rose much more modestly by comparison (for example, the largest gain in survival rate occurred between grades 1 and 2, and the increase was only 24 percent).

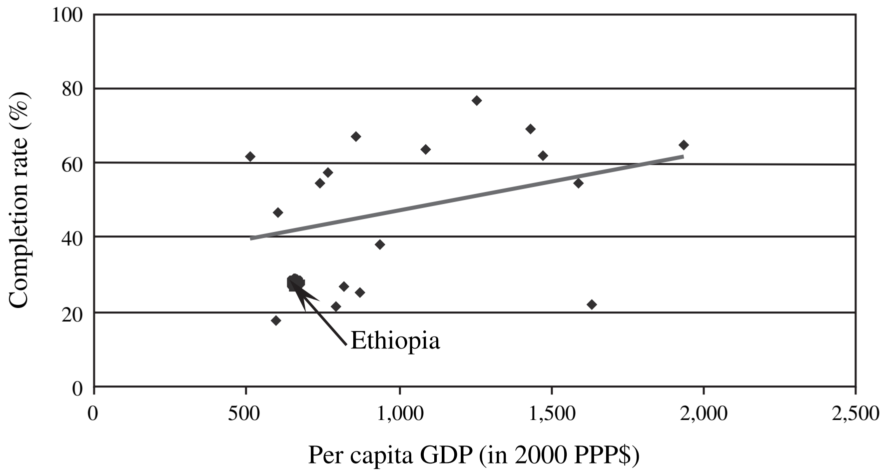
Figure 2.14 puts Ethiopia's grade 6 cohort completion rate in a cross-country perspective. While Ethiopia's rate is not the lowest among countries at its level of development, there is much scope for improvement. It is important to recognize that as new entrants to grade 1 must inevitably come from more and more difficult-to-reach populations, this indicator may not rise as rapidly in the coming years as it had in the past. If this expectation materializes, cohort completion rates can rise only as the system improves its ability to retain the children it currently attracts to enroll in school.

Grade Repetition

Grade repetition is an important problem to address because it increases the probability of dropout—by signaling parents that their child is not progressing academically. It also reduces the efficiency of student flow in that a repeater costs at least twice as much per grade attained as a nonrepeaters, while yielding only modest gains, if any, in terms of student learning.

In Ethiopia, the authorities make a distinction between repeaters and readmitted students: the former are students who sit for and fail the year-end examination, and return to

Figure 2.14. Relation between Grade 6 Cohort Completion Rates and Per Capita GDP, African Countries, circa 2000



Note: Completion rates in this figure are computed as the product of cohort entry rates to grade 1 and composite cohort survival rates to grade 6; see text for further explanation on these indicators.

Source: Cohort entry rates estimated from various Demographic and Health Surveys and composite cohort survival rates estimated from data on nonrepeaters for two consecutive years; per capita GDP (gross domestic product) from World Bank World Development Indicators 2003, as reported in the SIMA database.

the same grade the next school year; the latter are those who drop out during the school year without sitting for the year-end examination and return to the same grade the next school year. The distinction helps educators isolate two factors associated with grade repetition: inefficiencies in the teaching process itself, and demand-side constraints, which cause students to stop their schooling before the end of the school year and which in turn retard their learning and make it necessary for them to repeat the grade. While the separation of the two types of students has its use, we set it aside for our analysis of student flow for three reasons. First, the inclusion of readmitted students in the count of repeaters would avoid a serious underestimation of cohort survival rates (because such students would otherwise be treated as dropouts in the calculation). Second, it would render Ethiopia's data comparable to those of other countries. Third, it would make it possible to construct an internally consistent time series for Ethiopia as well, since the distinction between repeaters and readmitted students was made only from 1993 E.C. (school year 2000–01) onward.

Trends over Time. Table 2.7 shows the grade-specific repetition rates among primary and secondary students in 1992–93 and 2001–02. For completeness, it also shows the share of readmitted students among those who were enrolled in the same grade for two or more years. The large share of such students emphasizes the importance of clarifying the definition of the repetition rate, especially if the indicator is to be used for monitoring the system's performance over time. Based on the definition used here, repetition rates rose

Table 2.7. Repetition Rates and Share of Readmitted Students among Repeaters, Ethiopia, 1993–93 and 2002–03

	Percentage of students who repeated the grade[a/]			Readmitted students as a share of all repeaters, 2002–03 (percent)[b/]
		2001–02		
Grade	1992–93	Percent	Index (1992–93=1.00)	
1	15.4	19.1	1.24	43.1
2	8.7	14.1	1.62	43.3
3	6.9	13.2	1.91	44.4
4	8.4	16.1	1.92	35.5
5	6.2	15.9	2.58	37.6
6	11.0	11.5	1.05	48.4
7	12.5	22.6	1.81	33.1
8	21.3	22.1	1.04	21.0
Grades 1–8	11.6	16.4	1.42	39.8
Grades 9–10	19.3	20.8	1.08	38.3
Grades 11–12	8.5	0.4	0.05	22.8

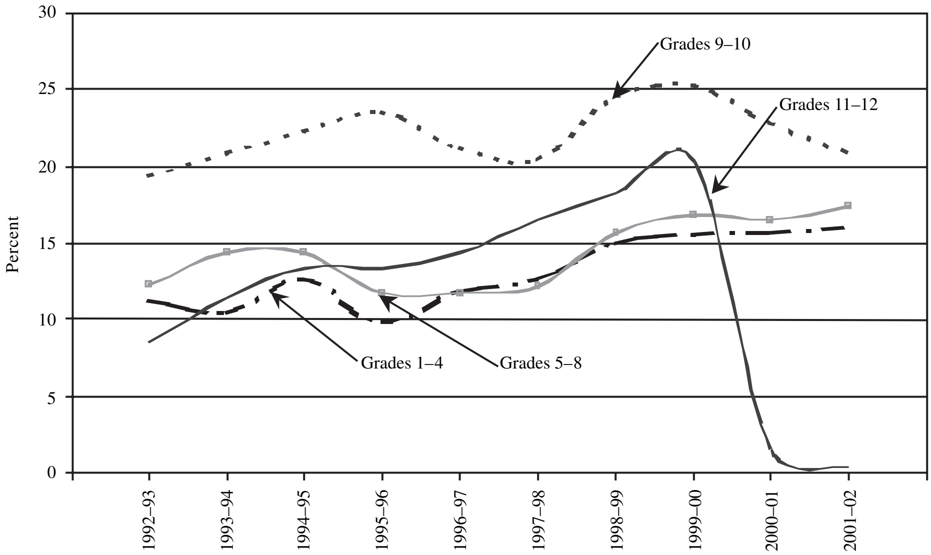
Note: The repetition rate is defined as the number of repeaters in grade X in year Y relative to the number of students in grade X in year Y–1.
a. Repeaters include all students who were enrolled in the same grade for two consecutive years, regardless of whether or not they sat for the year-end examination.
b. Readmitted students are those who drop out during the school year and return to the same grade the next year.
Source: Based on data on enrollments by grade and year reported in Govt. of Ethiopia 1993–94 and 2001–02.

between 1992–93 and 2001–02, for an overall average increase of 42 percent for the primary cycle as a whole. The increase in grades 9–10 was much smaller, only 8 percent; in grades 11–12, repetition has practically disappeared as a result of the new policy that was implemented in 2000–01.

Figure 2.15 puts a historical perspective on the trends in repetition rates. The rates in both subcycles of primary schooling are comparable, and have been rising consistently since 1997–98. In grades 9–10, the rates have oscillated up and down in the 20 to 25 percent range for most of the period, while in grades 11–12, they have been rising steadily since 1992–93; they reached a high of more than 20 percent by 1999–2000 before dropping to near 0 under the newly implemented policy, which sharply curtailed repetition in these grades.

Cross-country Comparisons. Ethiopia ranks in the middle of a group of low-income countries for which data are available on the percentage of repeaters among those enrolled in grades 1–6 (see Figure 2.16; note that for this comparison, Ethiopia's data have been adjusted accordingly). The lesson to draw from the figure is that while grade repetition is not yet a serious problem in Ethiopia, it has been growing in the past few years and could get worse—given the experience of such places as Rwanda and Bangladesh—in the absence of explicit

Figure 2.15. Repetition Rates in Primary and Secondary Education, Ethiopia, 1992–93 to 2001–02



Note: Repetition rates in this figure are computed by dividing the total number repeaters (including readmitted students) in grade X in year Y by total enrollments in grade X in year Y–1.

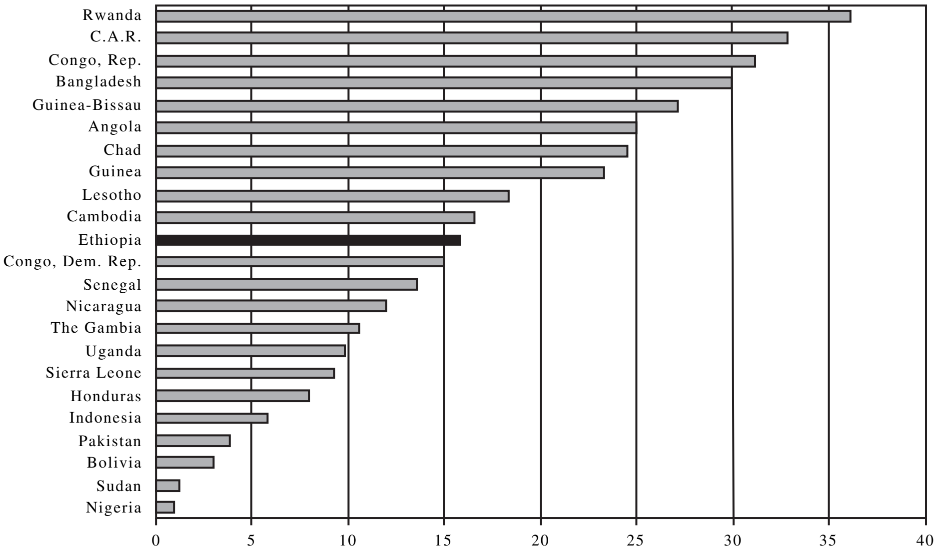
Source: Based on data in technical note table T2.1

attention to this aspect of student flow. Requiring repeaters to exit the system, as was recently instituted as a policy in upper secondary education, is a possible solution. While the approach is probably appropriate at that level to help manage the huge demand for places in government secondary schools, it detracts entirely from the goal of achieving universal primary completion. Automatic promotion is also flawed as a solution because it merely shifts to the next grade the underlying problem of inadequate student learning. More promising are solutions that combine at least three elements: (a) automatically promoting students within subcycles of two or three years; this would avoid unnecessary compartmentalization of the learning process and allow lagging students to build on skills already acquired rather than starting each year with curricula covered the previous year; (b) stabilizing teacher assignments in each subcycle so that teachers could work with the same group of pupils over several years and familiarize themselves with their charges and their learning needs; and (c) strengthening support for teachers, enhancing their skills in formative evaluation of student learning and introducing other measures to improve teaching effectiveness in the classroom.

Summarizing the Efficiency of Student Flow

An education system that is characterized by grade repetition and dropout uses more resources to produce its graduates than one free from these problems. We can thus use information on

Figure 2.16. Repeaters as a Percentage of Enrollments in Primary Education, Ethiopia and Other Low-Income Countries, circa 2000



C.A.R. Central African Republic; Congo, Dem Rep., Democratic Republic of the Congo; Congo Rep., Republic of Congo.

Note: Sample includes countries with a six-year primary cycle. The rate for Ethiopia refers to grades 1–6 in 2000–01.

Source: For Ethiopia, authors' calculation based on data on enrollments and repeaters (including readmitted students) in Govt. of Ethiopia 2000–01; for all other countries, Bruns, Mingat, and Rakotomalala 2003.

these indicators to evaluate the system's student flow efficiency. Table 2.8 assembles the data for 1993–94 and 2001–02 from which an index of flow efficiency can be calculated. To illustrate the computation, consider the data for 2001–02. Starting with a cohort of 1,000 pupils, the resources spent in grade 1 amount to 1,235 pupil-years (=1,000/[1–0.191]). In grade 2, only 746 pupils are left, and the resources invested in them amount to 867 pupil-years (=746/[1–0.141]). Continuing likewise to the remaining grades, the cumulative resources spent on the cohort for eight years of primary schooling amount to 5,704 pupil-years. Since only 363 eighth-graders are actually produced, only 2,904 pupil-years (=363 × 8) would have been needed in the absence of repetition and dropout. In other words, the system in fact operates at only 0.51 (=2,904/5,704) times as efficiently as a system in which all entrants reach grade 8 and do so without repeating a grade. Isolating the contribution of dropout alone, a total of 4,749 pupil-years are invested to produce 398 eighth grade graduates, implying a dropout-related efficiency index of 0.61. Considering only grade repetition, we see that a total of 5,704 pupil-years were used when 4,749 pupil-years would have sufficed, which yields a repetition-related efficiency index of 0.83.

Comparing the results for 1993–94 and 2001–02, it is clear that the system has become less efficient over time, and that dropping out contributes a greater share of the efficiency loss

Table 2.8. Efficiency of Student Flow in Primary Education, Ethiopia, 1993–94 and 2001–02

Grades	1993–94			2001–02		
	Number left from an initial cohort of 1,000	Repetition rate[a/]	Pupil-years invested	Number left from an initial cohort of 1,000	Repetition rate[a/]	Pupil-years invested
1	1,000	0.139	1,162	1,000	0.191	1,235
2	580	0.075	627	746	0.141	867
3	539	0.055	570	652	0.132	751
4	518	0.086	567	587	0.161	699
5	489	0.064	522	515	0.159	612
6	483	0.137	559	450	0.115	508
7	413	0.147	484	437	0.226	564
8	385	0.243	508	363	0.221	467
Cumulative pupil years	4,406		4,999	4,749		5,704
Index of efficiency[b/]						
Dropout-related		0.70			0.61	
Repetition-related		0.88			0.83	
Overall[c/]		0.62			0.51	
		(0.71)			(0.61)	

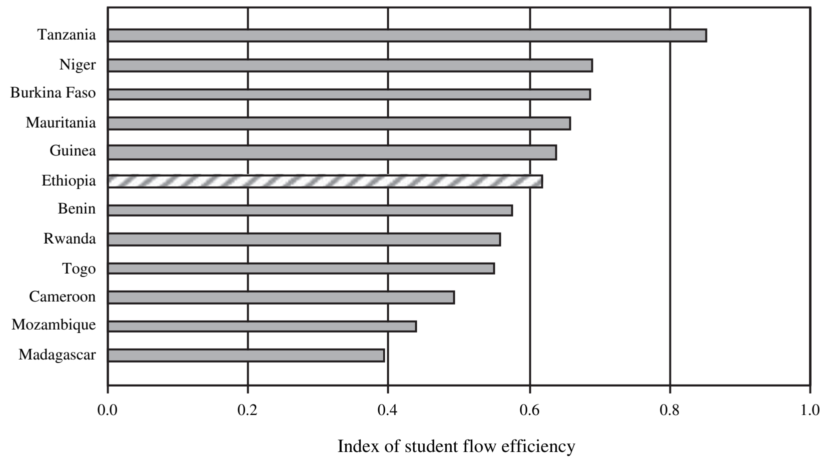
a. Defined as the number of repeaters in grade X in year Y+1 relative to the number of students in grade X in year Y.
b. The index is defined as the ratio between the cumulative pupil-years invested in a system with neither dropping out nor grade repetition, and the actual cumulative pupil-years invested given the pattern of dropping out and repetition. Thus, the closer is the index to 1.0, the more efficient is the student flow.
c. Figures in parentheses refer to the index associated with student flow patterns in grades 1–5.
Source: Authors' estimates based on survival and repetition rates reported in Tables 2.5 and 2.6.

than repetition in both years (as reflected in the smaller index associated with dropout in both years). A system operating at an efficiency rate of 51 percent is indeed incurring a significant loss of resources. For comparison, Figure 2.17 ranks Ethiopia's performance against those of education systems in other low-income African countries for which an index could be computed, standardizing across all countries for five years of schooling. Although Ethiopia is not currently at the bottom of the group, it could easily slip into that position by allowing repetition rates to rise as high as they have in such countries as Madagascar, or, alternatively, improve its position by increasing survival rates and lowering grade repetition to the levels in Tanzania (which were, respectively, 74 percent and 4 percent in 1999).

Issues for Policy Development

Following the reforms in 1994, Ethiopia's education system now serves a much larger clientele, particularly at the bottom of the pyramid. While the stresses of rapid growth have

Figure 2.17. Efficiency of Student Flow in Grades 1–5 in Ethiopia and Other African Countries, circa 2000



Note: The index refers to student flow in Grades 1–5 in all countries shown above. It ranges from 0 to 1.0, respectively, to a situation where all students dropout or repeat, to one in which all students reach Grade 5 without repetition corresponding, or dropping out.

Source: Authors' calculation based on data in table 2.6 for Ethiopia, and UNESCO 2001 for data on survival and repetition rates for all the other countries.

undoubtedly produced many new challenges for policy development, the analysis presented in this chapter has identified three issues that warrant close attention:

- The system's 4-4-2-2 structure and the loci of student flow regulation;
- Indicators for monitoring progress toward the education MDG; and
- Options for raising entry and survival rates in primary education.

We briefly review the first issues below, deferring the third issue to Chapter 4 where an analysis of social disparities in schooling provides a fuller context for considering these options.

Structure of the Education System and Loci of Student Flow Regulation

There is now widespread agreement that literacy and numeracy are core skills that can boost a child's life chances in adulthood. Accordingly, most governments seek to universalize basic education as part of their strategy for social development and poverty reduction, a goal that was formalized in the 2000 United Nations Declaration on the Millennium Development Goals. In that Declaration, basic education is defined as five years of primary schooling, but obviously, as countries develop and their economies mature, we would expect it to be extended to eight or nine years of schooling, typically covered by primary and lower secondary education, and indeed, even to 12 years, as in the most advanced economies. The appropriate speed for moving toward a longer cycle is ultimately constrained by labor market considerations. If the education system produces more graduates qualified beyond the core skills of basic literacy and numeracy than can be absorbed in the prevailing job market, the investment would be wasted to the extent that graduates fail to find work appropriate to their level of training and so lose the expected returns on their investment. With enough frustrated job seekers on the streets, the situation could easily escalate into a serious social problem. In part to minimize this risk and to institute a merit-based system that allocates scarce places in postprimary education, most governments in low-income countries use standardized examinations to regulate the flow of students beyond basic education.

In Ethiopia, the current 4-4-2-2 structure is not in itself a problem. What is of concern is that the loci of selection tend to be loaded toward the high end of the system, the first standardized examinations occurring only at grade 8. The lack of a selection point earlier in the system may not matter much at present because most first-graders drop out long before they reach grade 8, leaving only slightly more than a third of the entrants who eventually do so. Yet, its absence would undoubtedly increase the difficulty of managing the pressure on postprimary education as basic education expands. Already the government has found it necessary to radically restrict access to grade 11, diverting grade 10 completers to programs in teacher training, and technical and vocational education and training, in order to relieve the rapid buildup of pressure on preparatory and higher education in recent years. In some ways, the new policy effectively amounts to a shrinking of the overall size of upper secondary education, as well as a redirection of enrollments toward occupationally defined fields. The shaded cells in Table 2.9 show the drastic drop in enrollments in grades 11 and 12 as the new policy took effect from 2001–02 on.

As the country makes progress in expanding enrollments in primary education, the pressures on the system will inevitably grow. If other countries' experiences are a guide, it will in fact be necessary not only to tighten selection between grades 8 and 9 but at an even

Table 2.9. Enrollments in Grades 8–12 in Government and Nongovernment Schools, Ethiopia, 1999–2000 to 2002–03

	Enrollments in thousands			
Grade	**1999–2000**	**2000–01**	**2001–02**	**2002–03**
8	268.4	299.7	352.5	444.3
9	211.3	265.7	312.1	355.0
10	156.1	112.5	156.1	193.1
11	131.6	175.7	33.0	50.0
12	72.7	95.4	183.5	28.7

Note: Data refer to students in regular programs only; shaded cells draw attention to large reductions in enrollments arising from a new policy to tighten selection into preparatory secondary education.

Source: Govt. of Ethiopia various years, Education Statistics Annual Abstracts.

earlier point as well. Where precisely to do so is entwined with decisions about the duration of schooling to be universalized. The current 4-4 structure in primary education does not make for an easy choice: universalizing eight years of schooling is probably fiscally unviable even in the medium term, while universalizing only four years seems overly modest against the five years defined in the MDG Declaration (and probably also inadequate if pupils are to achieve permanent literacy and numeracy). If Ethiopia chooses to universalize five years of schooling, it would make sense to introduce, as part of the policy package, a new selection mechanism at the end of grade 5 in order to strengthen the management of student flow throughout the system.

Indicators for Monitoring Progress toward the Education MDGs

In the past, cross-sectional measures such as the gross and net enrollment ratios have been popular (in part because they are easy to compute), but they are flawed in ways that make them unsuitable for tracking how well a country is progressing toward ensuring that all children have access to a full cycle of primary schooling.[45] Increasingly used instead, particularly in the arena of international development assistance, is the primary school completion rate (typically at grade 5 or 6). Yet, as the analysis in this chapter has revealed, cohort rather than cross-sectional estimates of this indicator are required if the intention is to track changes over time. In Ethiopia's rapidly expanding system, cross-sectional estimates are particularly inadequate because they are highly distorted by the transitory presence of multiple cohorts and by the related mismatches in the age profiles of the denominator and numerator populations relevant to the calculations. Clarity is also needed with regard to the measurement of grade repetition, another relevant indicator for monitoring performance. While incomplete as an indicator of system efficiency, high rates of repetition point to possible problems in managing student flow, which, if left unattended, are likely to make it harder to raise survival rates.

Assuming that school completion and repetition are to be tracked, it will be important to agree on the methods and sources of data for making the estimates. Tradeoffs are inevitable, but important considerations include the following: (a) use of cohort rather than cross-sectional measures, for the reasons explained above; (b) reliance on data generated by existing mechanisms to avoid overburdening scarce data collection capacity; and (c) use of simple calculations that keep tedious data manipulation to a minimum. Table 2.10 shows the indicators that are likely to meet these criteria. Cohort entry rates require survey data in which the educational status of children is reported. The fact that the data pertain to a sample rather than to the entire population is admittedly a flaw, but it cannot be avoided because of the nature of the desired statistic. The high frequency of household surveys in Ethiopia should make it possible to cross-check the estimates, all of which can be generated at relatively low cost by consistently including in the survey questionnaires a question for each household member aged 5 and above on whether or not they have ever

45. Other measures have also been identified, including: (a) the proportion of pupils starting grade 1 who reach grade 5; (b) the literacy rate of 15–24-year-olds; (c) ratio of girls to boys in primary, secondary, and tertiary education; and (d) the ratio of literate females to males of 15–24-year-olds. See <www.developmentgoals.org>.

been enrolled in school (and if so, in what type of school). The other indicators can be estimated using data generated from school censuses. While accuracy in the census data, particularly with regard to repetition status, continues to be an issue, these data pertain to the whole population of students, and can further be cross-checked by including, as is already done in some household surveys in Ethiopia, two additional questions in the survey instruments: (a) Are you currently enrolled, and if so, in what grade? and (b) Were you enrolled last school year, and if so, in what grade?

Table 2.10. Possible Indicators for Monitoring Progress in Primary Education in Ethiopia

Indicator	Definition/Comment	Source of Data
Cohort entry rate to grade 1	Percentage of age cohort ever enrolled	National household survey[a/]
Composite cohort survival rate, grades 1–5[b/]	Percentage of entrants who reach grade 5	Annual school censuses for data on enrollments and repeaters by grade
Composite cohort completion rate, grade 5	Product of the cohort entry and composite cohort survival rate to grade 5	Computed
Repetition rate, grades 1–5[c/]	Repeaters in grades 1–5 in year Y divided by enrollments in grades 1–5 in year Y–1	Annual school censuses

a. These surveys are carried out with high frequency by the Central Statistical Authority and typically include questions about schooling. The only requirement for our purpose is that the surveys should now consistently ask the same question every year to respondents ages 5–17: “Have you ever enrolled in school?”. The codes should make it possible to indicate whether the school is formal or informal.
b. Computed by first estimating survival rates between adjacent grades (nonrepeaters in grade X in year Y, divided by nonrepeaters in grade X–1 in year Y–1), and multiplying the resulting survival rates up to grade 5. The alternative reconstructed cohort method can be used for comparison, and can be applied to survey data to check the consistency of the results.
c. For reasons discussed in the text, repeaters should include all pupils who had previously attended the same grade, whether or not they sat for the year-end examination/test. Note that repetition rates for single grades or other groupings of grades could also be defined.

Conclusion

After two decades of near stagnation, enrollments grew rapidly at all levels following the implementation of the 1994 Education and Training Policy and Strategy. In primary and secondary education, large-scale investment in government schools has been the primary source of growth. Such schools dominate the system today and deliver fully subsidized services to nearly 90 percent of students at these levels. Enrollments in higher education also grew but with a lag and with much greater reliance on services that students pay for directly, with the result that currently almost 50 percent of students are unsubsidized by the government. Despite the gains in enrollments, however, the system’s coverage remains modest at all levels compared with that in other low-income countries. With only 60 percent of each cohort ever entering grade 1, a quarter of the entrants dropping out by grade 2, and nearly

50 percent by grade 5, Ethiopia appears unlikely to meet the Millennium Development Goal of universal primary completion by 2015 if present conditions persist. The challenges for educational development are therefore manifold. Two in particular emerge from the data and discussion presented in this chapter. First, the downstream effects of past expansion of the system will become increasingly difficult to manage if grade 8 remains the first point at which a formal mechanism exists to regulate student flow. An earlier selection point, say at grade 5, would make sense, particularly if this is the agreed duration of schooling to be universalized. The second challenge pertains to the need for continued progress in raising entry and survival rates in primary education, particularly in the early grades. Clarifying the indicators for tracking progress is important even as the government seeks to put in place policy reforms to attract more children to school and to ensure that the entrants remain enrolled long enough to become literate and numerate for life.

CHAPTER 3

Education Expenditures

Because Ethiopia's education system is at the early stage of development, its financing requirements can be expected to grow as the country strives to universalize primary school completion and foster the growth of other levels and types of education and training. The purpose of this chapter is to document the current pattern of education spending to gain insight into the financial challenges posed by these goals. Because recurrent spending is so central to the functioning of the system, the chapter focuses on this component of education expenditures. The discussion examines the aggregate levels and trends in spending as well as the evolution of its functional composition. It presents an in-depth analysis of education expenditures in 2001–02, the most recent year for which the desired data were available at the time of data analysis. Finally, it documents the volume and nature of household spending on education. Cross-country data are used, when available and appropriate, to provide an added perspective on the pattern of education spending in Ethiopia.

In brief, the analysis shows that education finance in Ethiopia poses a big challenge. As in most low-income countries, all levels of education are growing rapidly from a small base and there are competing demands on the government's limited funds. Since 1993–94, the pattern of spending has evolved in favor of administrative overheads and postsecondary levels of education. While the trend has not yet produced a major distortion of the functional allocation of spending, it is nonetheless important to emphasize the need to prioritize primary education in the allocation of public spending. To achieve such prioritization will likely require a greater reliance on private sources of funding for postprimary levels of education than at present. Because more money by itself does not necessarily produce results, it is crucial to ensure that resources throughout the system are used more efficiently. In primary and secondary education where the bulk of public money is spent, this will require a particularly close look at tradeoffs in the allocation of spending across inputs, as well as the scope for better management of the cost of teachers and the use of their time.

Overall Pattern of Recurrent Public Spending on Education

Below we present a brief overview of recurrent spending and its functional composition based on data for 1993–94 to 2001–02, the latest year for which the relevant data were available at the time of data analysis for this study. Given the complexity and evolving context of fiscal relations in Ethiopia, the available data were surprisingly comprehensive and reasonably well organized. Even so, they required extensive preparation (see Technical Note 1 at the end of this report) in order to minimize double counting, fill gaps in the data for items of spending that made up the reported aggregates, and rationalize their presentation for the analysis in this chapter.

National and Regional Trends in Aggregate Spending

Table 3.1 displays the relevant data. It shows that aggregate public spending on education rose, in constant 1994–95 prices, from 955.4 million Birr in 1993–94 to 1,696.8 million Birr in 2001–02—an increase of nearly 1.8 times. Much of the increase was recent and much of it went for capital investments. As a result, public recurrent spending on education in 2001–02 was virtually unchanged from its 1993–94 level of about 3.0 percent of the GDP.

The pace of increase in recurrent spending on education varied widely across the country. Spending by the federal government saw the largest increase—156 percent between 1993–94 and 2001–02, compared with the nationwide average increase of 77 percent. During this period, its share of total recurrent public spending rose from 13 to 19 percent, which implies a 45 percent increase in its share of the total (see last column of the table). Among the regions, Gambella saw the largest increase during the period—a rise of 144 percent, giving it an end-of-period share relative to start-of-period share of 1.33. However, its share of total recurrent spending remained very small, just over 1 percent in 2001–02. Dire Dawa, Harari, and Tigray also experienced bigger increases in recurrent public spending than the average increase nationwide. In Benshangul-Gumuz, Oromiya, and the SNNPR, spending rose by about the same proportion as the increase for the country as a whole; this enabled them to maintain their shares of total recurrent spending at about the same level as at the start of the period. By contrast, Addis Ababa, Afar, Amhara, and Somali clearly lagged behind, and their end-of-period shares of total spending relative to the corresponding shares at the start-of-period fell to 0.90, 0.69, 0.83, and 0.63, respectively.

The foregoing table also shows that in 2001–02, the regional distribution of spending in 2001–02 broadly mirrors the regional composition of the primary school age population. However, for Addis Ababa and, to a lesser extent, Benshangul-Gumuz and Harari, their 2001–02 shares of recurrent public spending on education were noticeably larger than their shares of the school-age population. Excluding spending by the federal government, Addis Ababa accounted for 10 percent of total recurrent public spending in 2000–01 but less than 3 percent of the primary school-age population. Its larger claim on resources is consistent with the fact that it has a more developed system of postprimary education. For Amhara

Table 3.1. Regional Distribution of School-Age Population and Recurrent Public Spending on Education, Ethiopia, 1993–94 to 2001–02

Region	Share of population ages 7–14, 2000	Share of Recurrent Spending[a/]									End-of-period share relative to start-of-period share[b/]
		1986 E.C.	1987 E.C.	1988 E.C.	1989 E.C.	1990 E.C.	1991 E.C.	1992 E.C.	1993 E.C.	1994 E.C.	
		1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–2000	2000–01	2001–02	
Tigray	5.9	4.6	4.8	5.4	5.5	5.4	5.6	5.4	5.2	5.4	1.13
Afar	1.9	1.8	1.8	1.3	0.7	0.8	1.0	1.2	1.1	1.4	0.69
Amhara	25.5	19.3	19.6	21.0	19.6	18.9	18.4	17.1	16.6	15.6	0.83
Oromiya	35.9	30.6	31.0	32.8	31.8	31.5	32.2	31.0	29.4	30.0	0.97
Somali	6.3	2.3	2.3	1.6	1.3	1.1	1.1	1.2	1.5	1.4	0.63
Benshangul	0.9	1.5	1.5	1.5	1.6	1.8	1.8	1.7	1.6	1.4	1.02
SNNPR	19.9	15.3	15.5	15.0	17.0	16.6	17.3	16.2	16.0	14.5	0.99
Gambella	0.3	0.8	0.8	0.8	1.0	1.0	1.1	1.2	1.0	1.1	1.33
Harari	0.2	0.9	0.8	0.8	0.9	1.0	0.9	1.0	1.1	0.9	1.13
Addis Ababa	2.9	8.9	9.1	7.8	7.5	8.0	7.4	8.1	8.1	8.1	0.90

(*continued*)

Table 3.1. Regional Distribution of School-Age Population and Recurrent Public Spending on Education, Ethiopia, 1993–94 to 2001–02 (*Continued*)

Region	Share of population ages 7–14, 2000	Share of Recurrent Spending[a/] 1986 E.C. 1993–94	1987 E.C. 1994–95	1988 E.C. 1995–96	1989 E.C. 1996–97	1990 E.C. 1997–98	1991 E.C. 1998–99	1992 E.C. 1999–2000	1993 E.C. 2000–01	1994 E.C. 2001–02	End-of-period share relative to start-of-period share[b/]
Dire Dawa	0.4	0.7	0.7	0.7	0.6	0.7	0.7	0.6	0.7	0.8	1.14
Federal govt.	—	13.4	12.0	11.2	12.4	13.1	12.6	15.2	17.6	19.3	1.45
All regions	100	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	n.a.
Memoranda on total spending:											
Amt. in mill. of 1994–95 Birr	955.4	913.1	970.2	1,035.5	1,018.3	1,070.6	1,102.2	1,370.5	1,696.8	n.a.	
Index (1993–94=100)	100	96	102	108	107	112	115	143	178	n.a.	
As percentage of GDP	3.0	2.7	2.6	2.6	2.6	2.6	2.6	3.0	3.0	n.a.	

n.a. Not applicable.

Benshangul, Benshangul-Gumuz; SNNPR, Southern Nations and Nationalities Peoples Republic.

Note: Spending on Black Lion Hospital is included in the budget for Addis Ababa University, but as 2000–01 is the only year for which spending on the hospital—amounting to 24.3′5 Birr (current prices)—is known, no adjustment is made to exclude this item of spending in the time series data shown here, nor in subsequent tables unless otherwise indicated.

a. Ethiopian Calendar years in top row; Gregorian Calendar years in bottom row.

b. Data computed as the ratio between the average for 2000–01 and 2001–02 and the average for 1993–94 and 1994–95.

Source: See Appendix Table A3.1.

and Somali, the pattern is opposite to that of Addis Ababa. Amhara accounted for 26 percent of the school-age population but only 20 percent of recurrent public spending on education (net of the amount accounted for by the federal government). Somali accounted for 6 percent of the school-age population but less than 2 percent of total recurrent public spending.

Trends in the Functional Composition of Spending

Several features characterize the functional composition of recurrent public spending in Ethiopia and its evolution (Table 3.2). At the aggregate level, there has been a very large increase in spending on administration by the federal as well as regional governments. In constant 1994–95 prices, the amount rose almost fourfold, from about 48 million Birr in 1993–94 to almost 180 million Birr in 2001–02, compared with an increase of less than twofold in the overall total. Much of the increase coincided with the decentralization of the education sector beginning in 1995–96.

A second noteworthy feature in the table is the very large difference in the trends in spending across subsectors. Spending on technical and vocational education was modest in 1993–94, but in line with the government's explicit policy of expanding this option in the education system, it grew by 12-fold in real terms between 1993–94 and 2001–02. Similarly, spending on teacher training colleges (TTCs) and on higher education also saw substantial increases during the period, registering increases of nearly fivefold and more than threefold, respectively. By contrast, spending on primary and secondary education, and on the teacher training institutes (TTIs) remained essentially flat until 2000. Figure 3.1 provides a visual summary of the differences in trends across the main subsectors.

By early 2000, the cumulative impact of the foregoing trends had produced a noticeable shift in the composition of recurrent public spending. The combined share of spending on primary and secondary education fell from 81 percent in 1993–94 to 63 percent in 2001–02; while the share of spending on administration rose from 5 percent to 11 percent; that of TVET, from 1 percent to more than 5 percent; that of higher education, from 9 percent to more than 17 percent. The share of TTCs remained modest at just over 1 percent of the total even though the subsector had registered very rapid growth in spending since 1993–94.

Regional Diversity in the Functional Composition of Spending

The aggregate changes in the composition of spending reflect underlying regional patterns. Below we examine the regional patterns of spending on administration and on primary and secondary education.

Spending on Administration. The relevant data are shown in Table 3.3; to facilitate comparison, the regional data that were presented earlier on overall recurrent spending in 2001–02 and the percentage increase in real terms since 1993–94 are also included. In all regions, spending on administration, in constant 1994–95 prices, rose much faster than total recurrent spending. In Addis Ababa, the increase was about 11-fold, compared with a less than twofold increase in total recurrent public spending; in Dire Dawa, it exceeded 20-fold, compared with a twofold increase in total recurrent spending. The increases in the remaining

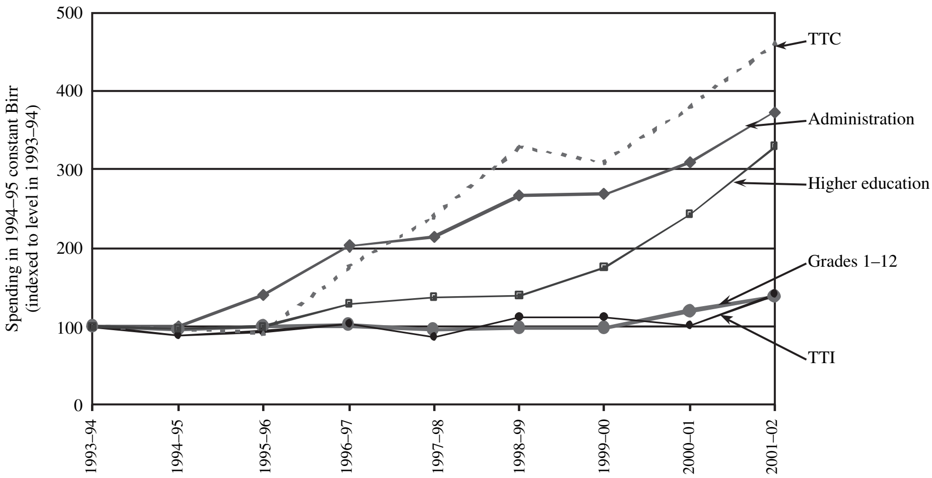
Table 3.2. Recurrent Public Education Spending Trends and Composition by Subsector, Ethiopia, 1993–94 to 2001–02

	1986 E.C.	1987 E.C.	1988 E.C.	1989 E.C.	1990 E.C.	1991 E.C.	1992 E.C.	1993 E.C.	1994 E.C.
Item	**1993–94**	**1994–95**	**1995–96**	**1996–97**	**1997–98**	**1998–99**	**1999–2000**	**2000–01**	**2001–02**
Spending trends (1993–94 = 100)[a/]									
Administration	100	100	140	203	215	266	268	309	373
Primary & secondary	100	95	100	101	97	99	98	121	139
Grades 1–8	100	96	101	105	100	103	103	122	140
Grades 9–12	100	95	98	81	75	76	75	113	128
TVET	100	117	99	105	187	204	189	312	1221
TTI	100	88	93	103	86	111	111	102	139
TTC	100	96	92	175	239	329	310	380	461
Higher education	100	97	99	128	137	139	176	244	330
Other	100	83	71	55	60	64	73	105	143
Total	100	96	102	108	107	112	115	143	178

Percentage share of spending									
Administration	5.0	5.3	6.9	9.4	10.2	11.9	11.7	10.8	10.6
Primary & secondary	80.9	80.7	80.0	75.7	73.2	71.2	69.0	68.0	63.1
Grades 1–8	68.9	68.9	68.5	66.7	64.8	63.1	61.2	58.5	54.4
Grades 9–12	12.0	11.9	11.5	9.0	8.4	8.1	7.8	9.4	8.6
TVET	0.7	0.9	0.7	0.7	1.3	1.3	1.2	1.6	5.1
TTI	1.5	1.4	1.4	1.4	1.2	1.5	1.5	1.1	1.2
TTC	0.4	0.4	0.4	0.7	1.0	1.3	1.2	1.2	1.1
Higher education	9.3	9.4	9.1	11.0	11.9	11.5	14.2	15.8	17.3
Other	2.1	1.8	1.5	1.1	1.2	1.2	1.3	1.6	1.7
Total	100	100	100	100	100	100	100	100	100
Memoranda on total spending:									
In millions of current Birr	847.6	913.1	979.4	1,084.1	1,174.8	1,265.8	1,343.2	1,563.5	1,799.3
In millions of constant 1994–95 Birr	955.4	913.1	970.2	1,035.5	1,018.3	1,070.6	1,102.2	1,370.5	1,696.8

Note: First row shows Ethiopian Calendar years, second row, Gregorian Calendar years. TVET Technical/Vocational Education and Training; TTI Teacher Training Institute; TTC Teacher Training College.
a. Spending trends are based on amounts in 1994–95 constant Birr.
Source: See Appendix Table A3.2.

Figure 3.1. Trends in Recurrent Spending on Selected Components of Education, Ethiopia, 1993–94 to 2001–02



TTI Teacher training institutes; TTC Teacher training colleges.

Source: Based on data in appendix table A3.2.

Table 3.3. Regional Recurrent Spending on Education, and Amount and Share of Spending on Administration, Ethiopia, 2001–02

Region	Total recurrent spending, 2001–02: In millions of current Birr	Total recurrent spending, 2001–02: As ratio of spending in 1993–94[a/]	Spending on administration, 2001–02: As ratio of spending in 1993–94[a/]	Spending on administration, 2001–02: As percentage of regional recurrent spending on education[b/]
Tigray	96.7	2.07	2.10	6.6
Afar	24.5	1.35	5.44	17.8
Amhara	280.2	1.43	8.12	13.0
Oromiya	540.3	1.74	7.84	8.2
Somali	26.1	1.14	2.27	11.0
Benshangul-Gumuz	25.3	1.71	4.13	17.6
SNNPR	261.6	1.69	4.29	9.6
Gambella	20.3	2.53	4.79	19.7
Harari	16.1	1.80	2.87	8.2
Addis Ababa	146.1	1.62	10.84	17.5
Dire Dawa	14.3	2.11	20.14	20.0
Federal government	347.8	2.57	9.38	9.4
Ethiopia	**1,799.3**	**1.78**	**3.73**	**10.6**

SNNPR Southern Nations and Nationalities Peoples Republic.

a. Spending amounts in numerator and denominator expressed in constant 1994–95 Birr.

b. Figures at the federal and national levels refer to the share of spending on administration at these levels of aggregation.

Source: Appendix Table 3.3.

regions were less spectacular, but still substantially larger than the overall increases in recurrent spending on education Tigray is the only exception, where spending on administration rose by about the same percentage as the overall increase in recurrent spending on education. As a result of these trends, spending on administration in some regions now absorbs a relatively large share of the region's total recurrent spending on education. The share in 2001–02 is nearly 20 percent in Dire Dawa and Gambella, and nearly 18 percent in Addis Ababa, Afar, and Benshangul-Gumuz. Only Tigray has managed to keep the share of administrative expenses below 7 percent of the region's overall recurrent spending on education.

Spending on Primary and Secondary Education and TVET. Table 3.4 displays the regional trends in spending on primary and secondary education, along with the subsector shares of overall spending in 2001–02. Because TVET is relatively new, the Table shows only its share of recurrent spending in 2001–02. Between 1993–94 and 2001–02, real spending across regions increased by an average of 40 percent in primary education and by 103 percent in secondary education, compared with an average increase of 74 percent in the regions' overall recurrent spending on education. Important regional patterns underlie these averages. Tigray distinguishes itself by being the only region where spending on primary education has kept pace with the overall increase in spending. In the other regions, this subsector has consistently lost ground between 1993–94 and 2001–02 in the claim on public resources. In Afar,

Table 3.4. Regional Recurrent Spending on Primary, Secondary, and Technical and Vocational Education and Training, Ethiopia, 2001–02

	Spending in 2001–02 as a ratio of spending in 1993–94[a]			Percentage share of regional recurrent spending on education[b]		
Region	**Overall**	**Grades 1–8**	**Grades 9–12**	**Grades 1–8**	**Grades 9–12**	**TVET[c]**
Tigray	2.07	2.07	2.07	75.7	9.9	2.1
Afar	1.35	0.75	3.07	44.0	34.1	0.0
Amhara	1.43	1.29	0.92	75.1	7.0	1.7
Oromiya	1.74	1.45	1.70	68.5	11.9	7.9
Somali	1.14	1.00	0.80	71.8	7.9	2.9
Benshangul-Gumuz	1.71	1.48	1.58	71.6	7.9	0.0
SNNPR	1.69	1.52	1.01	74.5	6.3	2.3
Gambella	2.53	1.71	5.26	50.3	7.9	1.2
Harari	1.80	1.64	2.80	63.8	20.7	0.0
Addis Ababa	1.62	1.09	0.73	38.5	15.7	22.8
Dire Dawa	2.11	1.42	2.41	46.0	22.1	11.6
Average	1.74	1.40	2.03	61.8	13.8	4.8

SNNPR, Southern Nations and Nationalities Peoples' Republic.
a. Amounts in both the denominator and numerator denominated in 1994–95 constant Birr.
b. Columns do not add to 100 percent because of the omission of spending on administration (shown in the previous table) and other items (e.g., teacher training institutes and colleges in some regions and special education).
c. Refers to Technical and Vocational Education and Training; increase since 1993–94 not shown because spending was 0 in that year for most regions.
Source: Based on data in Appendix Table A3.3

the loss is especially large—spending on primary education in 2001–02 was only 75 percent as high as it was in 1993–94. In secondary education, the trends in spending are more varied: in Tigray, spending on this subsector again kept pace with the overall increase in the region's recurrent spending on education; in Afar, Gambella, and Dire Dawa, the increase was bigger than the overall increase, while the opposite trend is true in the remaining regions. The increases in Afar and Gambella were especially large, having risen in real terms by more than threefold and more than fivefold, respectively, between 1993–94 and 2001–02.

The combined impact of the trends in spending on administration, and on primary and secondary education, is to produce an interesting diversity in distribution of spending across regions for 2001–02. The regions fall broadly into two groups: the first group consists of Tigray, Amhara, SNNPR, Oromiya, Somali, Benshangul-Gumuz, and Harari (where spending on grades 1–8 accounts for between 63 and 76 percent of the regional recurrent spending on education); the second consists of Afar, Gambella, Dire Dawa, and Addis Ababa where the shares are distinctly lower in the range between 39 and 50 percent. In the first group, the relatively high shares of primary education are achieved mostly by keeping a lid on spending on TVET or on administration. In the second group, the squeeze on primary education has allowed resources to be diverted to TVET (as in Addis Ababa and Dire Dawa), secondary education (as in Afar), and administrative services (as in Gambella).

A Closer Look at Recurrent Public Spending on Education in 2001–02

We turn now to examine more closely the allocation of recurrent public spending in 2001–02 (1994 E.C.) across economic categories and subsectors. The data presented below were prepared by first estimating expenditure on the salaries of teachers and administrative staff at the school level (based on information in the latest available school census), and then adding the expenditures on nonstaff items reported in the data files of the Ministry of Finance and Economic Development (MOFED). This approach provides an independent check on the accuracy of reported spending on salaries, the single biggest category of spending, and adds to our understanding of the composition of recurrent spending on education in Ethiopia.

Spending on Teachers and Other Personnel in Primary and Secondary Schools

To a large extent, the wage bill reflects the underlying distribution of staff by certification and seniority.[46] We thus begin below by highlighting a few pertinent characteristics of the teachers in government primary and secondary schools. Because administrative staff at the school level are few in number, only the aggregate spending on such staff will be presented below.

Selected Characteristics of Teachers in Primary and Secondary Schools. As the data in Table 3.5 show, most Ethiopian teachers obtained their preservice training through one of three

46. See Appendix Table A3.5 for information on the pay scale by level of teacher certification and seniority.

avenues: a teacher training institute (TTI), a teacher training college (TTC), or a university. According to official policy, teachers assigned to grades 1–4 should be TTI-certified; those assigned to grades 5–8, TTC-certified; and those assigned to grades 9–12 should possess a university degree. In practice, only the cadre of teachers in grades 1–4 match the expected profile, as 92 percent of them are indeed TTI-certified. In grades 5–8, just over a quarter of the teachers possess the expected credential, while in grades 9–12, only a third do. Setting aside for discussion in a later chapter the potential impact of these patterns on teaching and learning in schools, we take note of the pattern here simply to point out that it has obvious implications for the cost of teachers in each cycle.

Table 3.5. Distribution of Teachers in Government Schools by Level of Teaching Assigned, Certification, and Average Age, Ethiopia, circa 2002

	Level of teaching assigned		
Teacher qualification	**Grades 1–4**	**Grades 5–8**	**Grades 9–12**
Distribution of teachers by certification, 2001–02 (%)[a]			
Teachers Training Institute (TTI)	91.6	70.3	6.9
Teachers Training College (TTC)	4.3	26.4	59.5
Bachelor's or Master's Degree	0	0.1	32.8
Other [a]	4.1	3.1	0.8
Total	100%	100%	100%
Teachers in Oromiya, 2002–03[b]			
Average age	32	36	36
Average monthly pay (in current Birr)			
TTI-certified	601	697	755
TTC-certified	750	755	797
Bachelor's or Master's Degree	. .	. .	1,182

. . Too few observations to compute reliable estimates.
a. Based on information on teachers in 11,444 of the country's 11,871 schools in 2001–02.
b. Based on data for 49,728 teachers in Oromiya in 2002–03.
Source: Analysis of school census for 2001–02 and data on teachers from the 2002–03 school census for Oromiya.

The more detailed data for Oromiya give some idea of the link between teacher pay and certification. TTI-certified teachers assigned to grades 5–8 earn an average of 16 percent more than those assigned to grades 1–4; and among teachers in grades 5–8, those holding a TTC-certificate earn, on average, about 8 percent more than those with only a TTI-certificate. More experienced teachers should earn more but, as the data for Oromiya suggest, the difference among teachers in the various cycles may be limited in this regard. Finally, to complete the analysis, we used regression analysis to evaluate the combined impact of experience, certification, and teaching assignment. The results based on the data for Oromiya (reported in Appendix Table A3.4) suggest that, all else being the same, an additional year of experience raises earnings by about 3 percent at the sample mean; being assigned to teach in grades 5–8 and grades 9–12 raises pay by 3 and 11 percent, respectively, relative to the pay of teachers in grades 1–4; and having a TTC certificate raises pay by 17 percent relative to having a TTI certificate; having a university degree raises it by 36 percent.

Average Remuneration of and Aggregate Spending on Teachers and Other Staff. At the time of data analysis for this report, the detailed data on teacher pay described above were available only for Oromiya. Accordingly, for all regions, we rely on information from the school census to estimate average teacher remuneration and the aggregate wage bill.[47] The results appear in Table 3.6. As expected, the average cost of teachers rises with the level of schooling. In 2001–02, their annual remuneration (including pension and allowances) averaged nearly 7 times the per capita GDP among teachers in grades 1–4; and among teachers in grades 5–8 and grades 9–12, the corresponding figures were 8 and nearly 12 times, respectively. Administrative staff cost less: their annual remuneration was less than 4 times the per capita GDP among those who worked in primary schools, and less than 5 times among those in secondary schools. Combining the information on average teacher remuneration with the counts of teachers and administrative staff in each cycle pay yields the estimates of aggregate staff remuneration displayed in the table. These estimates are a key input for our reconstruction of recurrent spending on the various levels of schooling.

In passing, we note two features in the regional patterns of teacher remuneration. The first is the substantial variation across regions. In grades 1–4, average annual remuneration ranged from just under 6 times the per capita GDP in Tigray and Harari to 8.0 times in Afar where hardship allowances are provided. In grades 5–8, teachers cost, on average, 6 times the per capita GDP in Addis Ababa and as much as 10 times in Afar. In grades 9–12, the range is even wider, going from around 9 times the per capita GDP in the SNNPR to 16 times in Gambella. The second feature in the data is the regional differences in the structure of teacher remuneration across levels of schooling. The structure is essentially flat in Addis Ababa where teachers in grades 5–8 are about as costly as those teaching grades 1–4; it is relatively steep in such regions as Tigray and Harari where teachers in grades 5–8 cost about 50 percent more. Comparing the average cost of teachers in grades 9–12 relative to those in grades 5–8, we see the pattern becoming more diverse across regions: the gap ranges from a modest 9 percent in SNNPR and a still small 22 percent in Amhara, to nearly 70 percent in Tigray and Oromiya and about 90 percent in Addis Ababa.

Spending on Staff Remuneration in the other Subsectors

For postsecondary education, a similar exercise to estimate the wage bill was completed using data supplied by individual institutions in the context of the present study; the results are dis-

47. The school census contains information on the distribution of teachers by teaching assignment (grades 1–4, grades 5–8, or grades 9–12) and salary category. As the latter are defined by contiguous salary ranges, the average salary of teachers in the various subcycles was computed as a weighted average of the midpoint salary of each salary category. The result is then augmented by 8 percent to allow for the cost of pension and allowances (based on the size of these items reported in MOFED's budget data). For Oromiya, this approach yields estimates that are highly comparable with those based on the data for individual teachers.

Table 3.6. Average Annual Teacher Remuneration and Aggregate Spending on Teachers and Administrative Staff in Government Schools, Ethiopia, 2001–02

	Teachers' average annual pay[a/] (as a multiple of per capita GDP)			Teachers' aggregate wage bill (in millions of current Birr)			Administrative wage bill (in millions of current Birr)	
Region	**Grades 1–4**	**Grades 5–8**	**Grades 9–12**	**Grades 1–4**	**Grades 5–8**	**Grades 9–12**	**Grades 1–8**	**Grades 9–12**
Tigray	5.6	8.2	13.8	27.6	18.7	9.6	0.6	0.2
Afar	8.0	9.5	15.5	4.6	2.1	0.9	1.0	0.1
Amhara	7.1	8.1	9.9	118.2	61.8	23.7	3.5	2.2
Oromiya	6.9	8.3	13.7	159.7	120.4	57.2	5.6	4.1
Somali[b/]	*8.0*	*9.5*	*15.5*	10.5	7.0	2.1	0.4	0.1
Benshangul-Gumuz	6.4	7.7	12.1	8.8	2.5	2.7	0.1	0.2
SNNPR	6.9	7.8	8.5	94.0	70.5	14.0	0.8	0.3
Gambella	6.1	7.3	16.2	3.7	2.2	0.8	0.6	0.0
Harari	5.8	8.7	14.0	2.9	3.4	2.3	0.6	0.2
Addis Ababa	6.2	6.1	11.7	12.7	16.0	22.4	4.4	3.2
Dire Dawa	7.4	8.6	11.6	2.9	2.2	1.6	0.3	0.2
Ethiopia[c/]	**6.8**	**8.0**	**11.8**	**445.7**	**306.9**	**137.3**	**17.7**	**10.8**
Memorandum:								
Average wage of administrative staff (as multiple of per capita GDP)[d/]							3.7	4.6

SNNPR, Southern Nations and Nationalities Peoples Republic.

Note: Per capita GDP was 878.3 Birr in 2001–02 (1994 E.C.), which is computed here simply by dividing the GDP by the projected population in that year.

a. Includes base salary, pension, and allowance, the latter two items adding, on average, 8 percent to the base salary.

b. Data on teacher remuneration are unavailable. The wage data are shown in italics here to alert the reader that they are assumed to be the same as those for Afar (another remote region where teacher pay is augmented by a hardship allowance) for the purpose of estimating the aggregate wage bill.

c. The data on teacher remuneration in the next three columns refer to weighted averages.

d. Refers to weighted average.

Source: Average remuneration based on analysis of the 2001–02 school census; aggregate spending estimated by multiplying the average remuneration with the total number of government teachers (the latter as supplied for this study by the Education Management Information System Panel of the Ministry of Education).

played in Table 3.7 below.[48] Because of data constraints, estimates for technical and vocational education training (TVET) could not be made, and the amounts shown in the table for TVET reflect budget data, which are included mainly for completeness of presentation.

Table 3.7. Number of Academic and Administrative Staff, Their Average Remuneration and Aggregate Wage Bill in Teacher Training and Higher Education, Ethiopia, 2001–02

	Academic staff			Administrative and support staff		
Type/Level of Education	No. of staff	Average annual remuneration[a/]	Aggregate wage bill[b/]	No. of staff	Average annual remuneration[a/]	Aggregate wage bill[b/]
Teacher Training Institutes	332	19.1	5.6	905	4.5	3.6
Teacher Training Colleges	280	23.4	5.7	655	6.7	3.9
Higher Education						
Staff on local pay scales	2253	27.1	53.6	5852	7.9	40.4
Staff on expatriate pay scales[c/]	82	133.5	9.6	0	n.a.	n.a.

n.a. Not applicable.
a. Expressed as a multiple of GDP per capita which was estimated at 878.3 Birr in 2001–02 (simple division of the reported GDP by the projected population for that year).
b. Expressed in millions of current Birr.
c. Includes housing allowance.
Source: Analysis of data collected from individual institutions in the context of this study; see also Technical Note 1 in the appendix.

As expected, the cost of academic staff tends to increase with the level of instruction: it is almost 23 percent higher in TTCs as in TTIs, and about 16 percent higher in institutions of higher education than in TTCs. The average annual remuneration of staff paid on expatriate pay scales in higher education is almost five times that of their counterparts on local pay scales.[49] The cost of administrative and support staff is naturally much lower than that for academic staff. In 2001–02, the average annual remuneration of administrative and support staff in the TTCs was less than 24 percent that of the academic staff; and the corresponding proportions were about 29 percent among staff in the TTIs and in higher education.

48. See Technical Note 1 for a list of the institutions included in the estimates presented here and an explanation of the way in which gaps in the raw data were filled.
49. Academic staff on expatriate pay scales are typically paid against foreign aid and are often treated as off-budget items. Because other off-budget items could not be fully accounted for, we exclude it from the accounting exercise to maintain consistency in the treatment of the data.

Consolidated Picture of Spending on Staff and other Recurrent Costs

We combine the foregoing estimates of staff costs at all levels in the system with other recurrent costs from budget data to obtain an overview of spending. The data for two regions, Benshangul-Gumuz and Gambella, were problematic, and no estimate of the desired breakdown of spending could be made. Where data for these regions appear in the tables below, they reflect reported budget information and are included merely for presentational reasons.

Pattern for Ethiopia as a Whole. Table 3.8 shows the consolidated recurrent public spending on education by function and level; the most pertinent lines in the table are highlighted in bolded text. Our estimate of aggregate spending on staff salaries and benefits fell short of the corresponding budget amount by 10 percent, suggesting a reasonably good overall match between actual spending and the amount reported in the budget data. Discrepancies are substantial, however, in the estimates by subsector. Our estimate of the wage bill for grades 1–4, for instance, was only 62 percent as high as the amount reported in the budget. By contrast, the estimate of this item for grades 5–8 was 68 percent higher than the budget amount; and the estimate for grades 9–12 was 37 percent higher. One source of these discrepancies is the common practice of reporting teacher salaries according the qualification of the teachers (where TTI graduates are supposed to be assigned to grades 1–4, TTC graduates to grades 5–8, and university graduates to grades 9–12), and not according to the grade level they actually teach. Because a large share of the teachers in grades 5–8 and grades 9–12 hold less than the official certification required for their assignments, a sizable part of the salaries attributed to grades 1–4 were actually for staff teaching in grades 5–8 and grades 9–12.

Looking now at the distribution of spending across subsectors, we see from the table that in 2001–02, grades 1–8 accounted for 50 percent of total recurrent public spending on education (about the same as the 54 percent reported earlier based on budget data); the amount was split in 60/40 proportion between grades 1–4 and grades 5–8. Since 90 percent of all pupils and students in the education system are enrolled in primary education, the share of this subsector appears to be disproportionately low. It is also smaller than the 67 percent recommended in the indicative framework of the Education For All Fast Track Initiative, a benchmark based on allocation patterns in low-income countries that have either attained the Millennium Development Goal of universal primary school completion, or come close to it.[50] By contrast, the shares of all the other levels of education in actual spending and in budget allocations far exceed their respective shares of total enrollment in the education system. Higher education, for instance, accounted for only 0.5 percent of total enrollment in 2001–02 but claimed 17 percent of recurrent spending.

A few other features in the table stand out. In primary education, the share of recurrent spending allocated to nonsalary inputs is low—less than 7 percent overall, and less

50. See Bruns, Mingat, and Rakotomalala (2003). For countries with a six-year primary school cycle, the share of recurrent spending allocated to primary school is benchmarked at 50 percent in the indicative framework under the Education For All Fast Track Initiative. For a system such as Ethiopia's, which has an eight-year duration, the share is increased proportionally to 67 percent.

Table 3.8. Recurrent Public Spending on Education by Function and Level, Ethiopia, 2001–02
(millions of current Birr unless otherwise indicated)

		Primary education									
Expenditure item	**System admin.**[a/]	**Grades 1–4**	**Grades 5–8**	**Grades 1–8**	**Grades 9–12**	**TVET**	**TTIs**	**TTCs**	**Higher education**[b/]	**Other**	**Total**
Salaries and benefits[c/]											
Teachers	. .	433.1	302.2	735.3	133.8	. .	5.6	5.7	53.6	. .	934.1
Administrative staff	104.7	9.7	7.3	17.0	10.6	. .	3.6	3.9	40.4	. .	180.3
Contract and causal staff	. .	. .	. .	. .	. .	. .	. .	. .	4.7	. .	4.7
Misc. payment to staff[d/]	. .	. .	. .	. .	. .	. .	. .	. .	14.5	. .	14.5
Subtotal	104.7	442.9	309.5	752.4	144.5	28.5	9.1	9.6	113.2	11.6	1,173.6
As ratio to reported budget amount[e/]	**1.00**	**0.62**	**1.68**	**0.84**	**1.37**	**1.00**	**1.26**	**1.30**	**0.82**	**1.00**	**0.90**
Nonstaff recurrent spending[f/]											
Educational supplies	. .	12.8	7.2	20.0	16.4	54.6	0.6	0.9	31.6	2.5	126.6
Foodstuff	. .	0.0	0.2	0.2	0.8	0.5	6.3	2.6	45.9	2.2	58.6
Uniforms, clothing, & bedding	. .	0.8	0.9	1.7	0.6	0.3	0.4	0.3	3.7	0.5	7.4
Grants to individuals	. .	0.0	0.0	0.0	0.1	0.4	0.0	0.1	1.7	0.6	3.0
Other	76.8	13.1	18.9	32.0	26.1	6.8	4.8	9.2	69.3	12.3	237.4
Subtotal	76.8	26.7	27.2	53.9	44.1	62.7	12.1	13.0	152.2	18.1	433.0
Grand total[g/]	181.6	469.6	336.7	806.3	188.5	91.1	21.2	22.7	265.4	29.7	1,606.6

As ratio to reported budget amount[e/]	1.00	0.63	1.61	0.85	1.26	1.00	1.10	1.11	0.86	1.00	0.92
Percentage distribution of grand total	**11.3**	**29.2**	**21.0**	**50.2**	**11.7**	**5.7**	**1.3**	**1.4**	**16.5**	**1.8**	**100.0**
Share of nonwage spending	**42.3**	**5.7**	**8.1**	**6.7**	**23.4**	**68.8**	**57.1**	**57.3**	**57.3**	**60.9**	**27.0**
Memo. on MOFED budget data:											
Salaries and benefits[c/]	104.7	713.4	184.0	897.4	105.7	28.5	7.2	7.4	137.7	11.6	1,300.1
Total budget[g/]	181.6	742.5	208.8	951.3	149.8	91.1	19.3	20.4	308.3	29.7	1,751.4

. . Amounts that are either 0 or subsumed in the expenditure item shown.
TVET Technical and vocational education and training; TTI Teacher training institutes; TTC Teacher training colleges.
a. Refers to cost of services as reported in MOFED budget data and rendered by administrative personnel mapped to the Federal Ministry of Education, the Regional Bureaus of Education, or the *woreda*-level offices; the cost of administrative staff at the level of individual institutions are shown under the head for each subsector.
b. Excludes the amount for Black Lion Hospital (which is included in the budget for Addis Ababa University), assumed to be the same in 2001–02 as in 2000–01 (i.e., 23.4 million Birr), the only year for which data are available; and includes the salaries of expatriate staff paid on the local salary scale, but not expatriate staff paid on international pay scales. As the latter staff are paid off-budget (the bill being estimated at 9.6 million Birr in 2001–02), the table excludes this item so as to maintain uniformity in excluding all off-budget spending from the table.
c. Includes pensions and allowances.
d. Includes payment for part-time or overtime services.
e. In the absence of data from alternative sources, the amount of spending on system administration and on TVET are taken directly from the budget, which results in a ratio of 1.00 for these items.
f. Expenditure on nonsalary items are taken directly from reported budget data, which show the amount for each of the columns shown in this table. For Addis Ababa where the data report combined spending on grades 1–8, the amounts for the two subcycles in primary education are estimated by prorating according to the corresponding shares of total enrollments.
g. Excludes spending in Benshangul-Gumuz and Gambella for which the budget data show an undistributed aggregate of 25.3 and 20.3 million Birr, respectively, in 2001–02. The aggregate amount is equivalent to 2.8 percent of the GDP, compared with 3.0 percent according to reported budget data.
Source: Authors' estimate of the wage bill for personnel at the school level using data from the 2001–02 Ethiopia school census and reported MOFED data on the wage bill of staff in federal and regional administration and on nonsalary items of spending.

than 6 percent in the first cycle. The share of such inputs is substantially higher in the other subsectors. Leaving aside TVET where the distribution is based on budget data and where the nascent status of the system may produce unstable patterns of spending, it is noteworthy that nonsalary inputs claimed around 60 percent of recurrent spending in TTIs, TTCs, and higher education institutions. Foodstuff alone (presumably for students) claimed nearly 30 percent of all recurrent spending in TTIs, while its share was 11 percent in TTCs, and 17 percent in other higher education institutions. By contrast, the share of spending on educational supplies was 3 percent in TTIs, 4 percent in TTCs, and 12 percent in higher education institutions. In these subsectors, the distribution of spending between academic staff, and administrative and support staff, also warrants comment. The latter category of staff accounted for 39 percent of total spending on personnel in TTIs, 41 percent in TTCs, and almost 53 percent in higher education. Although it is beyond the scope of the present report to examine the factors behind these patterns in the allocation of recurrent spending, the apparent bias away from academic activities raises an important question about resource management that deserves further study.

Regional Patterns of Spending. Moving beyond the national aggregates, Table 3.9 presents estimates of expenditure patterns in each region. As already noted, Benshangul-Gumuz and Gambella are excluded because of data constraints explained in Technical Note 1. The aggregate amounts based on teacher remuneration and number of staff generally jibe with reported budget data, although the gaps are wider in some regions than in others. As expected, the bulk of regional spending is on primary and secondary education: grades 1–4 claim an average of 33 percent across regions, and grades 5–8 and grades 9–12 claim average shares of 24 and 18 percent, respectively.[51] The pattern in Addis Ababa is an exception. With its greater emphasis on TVET, Addis Ababa allocated less than 50 percent of its recurrent spending to primary and secondary education in 2001–02. Among the other regions, some noteworthy departures from the means also appear. Afar and Harari placed much greater emphasis than the other regions on grades 9–12 relative to grades 1–8. The regions that appear to be the most successful in prioritizing allocations to grades 1–4 are Amhara, Somali, and the SNNPR. Amhara allocated 46 percent of its total recurrent education spending to grades 1–4; Somali, 43 percent; and SNNPR, 40 percent.

Table 3.10 provides additional information on the pattern of regional spending on education. In particular, it shows the shares of spending on teacher salaries and on educational supplies in each subcycle; the residual shares, for spending on administrative services at the school level and other undefined items, are not shown to avoid clutter in the table. In both subcycles of primary education, teachers absorb the bulk of available resources, leaving very limited amounts for nonsalary inputs. On average, the share of educational supplies averaged less than 4 percent across regions in grades 1–8. In grades 9–12, the share of teacher salaries is lower—66 percent of the total recurrent spending

51. More detailed data (not shown here) show that actual spending estimated using the method described earlier shows percentage shares of grades 1–8 that are typically smaller than the shares based on spending reported in the budget data, by more than 6 percentage points in Oromiya and Harari, and by more than 10 percentage points in Tigray and Oromiya.

Table 3.9. Recurrent Spending on Primary and Secondary Education across Regions, Ethiopia, 2001–02

	Total regional recurrent spending on education[a/]		Percentage allocation of total regional recurrent spending on education				
			Primary Education				
Region	In millions of Birr	As ratio of budget amounts	Grades 1–4	Grades 5–8	Grades 1–8	Grades 9–12	Primary & secondary education
Tigray	82.0	0.85	37.5	27.8	65.3	17.7	83.0
Afar	21.5	0.88	29.9	15.2	45.1	29.8	74.9
Amhara	266.7	0.95	46.0	24.4	70.4	10.7	81.2
Oromiya	499.8	0.93	35.3	27.0	62.3	16.5	78.8
Somali[b/]	28.6	1.10	43.3	28.1	71.4	10.2	81.6
Benshangu-Gumuz [c/]	*25.3*	n.a.	—	—	*71.6*	*7.9*	*79.5*
SNNPR	240.6	0.92	40.0	31.2	71.2	7.9	79.1
Gambella[c/]	*20.3*	n.a.	—	—	*50.3*	*7.9*	*58.2*
Harari	14.2	0.88	27.6	29.3	56.9	25.7	82.6
Addis Ababa	133.3	0.91	12.7	15.7	28.4	21.3	49.7
Dire Dawa	12.8	0.90	28.2	19.0	47.3	17.2	64.5
Regional total[d/]	1,270.9	0.92	n.a.	n.a.	n.a.	n.a.	n.a.
Regional mean[d/]							
Unweighted	n.a.	n.a.	32.2	23.7	55.9	18.4	74.2
Weighted	n.a.	n.a.	36.0	25.9	61.8	14.6	76.4

— Data not available.
n.a. Not applicable.
SNNPR, Southern Nations and Nationalities Peoples Republic.
a. The amounts shown here are estimated following the method described in the text.
b. Estimate based on assumption that teacher remunerations are the same as in Afar, another remote region where teacher pay is augmented by a 30 percent increase as hardship allowance.
c. Data are shown here in italics to alert the reader that they are taken from MOFED budget data files and are the same are reported earlier in Table 3.3 and 3.4; see Technical Note 1 for an explanation about the data for this region.
d. Excludes data for Somali, Benshangul-Gumuz, and Gambella, and spending by the federal government.
Source: Authors' estimate of the wage bill for personnel at the school level using data from the 2001–02 Ethiopia school census and reported MOFED data on nonwage spending.

allocated to this subcycle. But as most of the resources are allocated to administrative services and other undefined expenditures, the share of spending on educational supplies remains modest—an average of 6 percent across regions. Thus, throughout the education system, the overall picture is one of very limited funding for nonsalary school inputs. This pattern of resource allocation is at odds with what would seem sensible, given the consistent finding in the research literature that textbooks and pedagogical supplies are among the most cost-effective inputs for improving student learning (for example, Lockheed and others 1991; ADEA 2003).

Table 3.10. Teacher Wages and Educational Supplies as a Percentage of Recurrent Spending in Primary and Secondary Education across Regions. Ethiopia. 2001–02

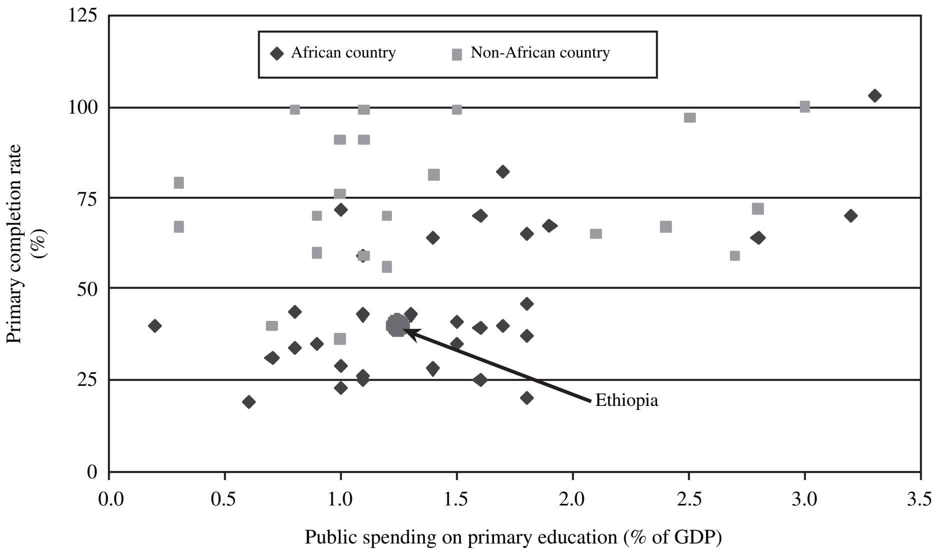
	Teacher wages as a percentage of subsector recurrent spending			Educational supplies as a percentage of subsector recurrent spending[a/]	
Region	Grades 1–4	Grades 5–8	Grades 9–12	Grades 1–8	Grades 9–12
Tigray	89.8	82.2	66.3	1.2	6.9
Afar	71.9	65.5	13.4	8.5	5.2
Amhara	96.4	94.8	82.7	0.8	1.6
Oromiya	90.4	89.3	69.2	4.1	15.2
Somali[b/]	84.5	87.4	73.5	2.9	0.0
SNNPR	97.7	93.8	73.1	0.6	1.7
Harari	73.2	82.1	64.0	1.4	5.5
Addis Ababa	75.2	76.7	78.8	4.7	5.1
Dire Dawa	80.5	91.4	73.3	8.8	7.4
Averages[c/]					
Unweighted	84.4	84.5	65.1	3.8	6.1
Weighted	92.5	89.8	71.0	2.5	8.9

SNNPR Southern Nations and Nationalities Peoples Republic.
Note: Estimates for Benshangul-Gumuz and Gambella unavailable for reasons explained in Technical Note 1. The percentage share of spending on teachers and educational supplies does not add to 100 percent, as the residual category of spending on administrative staff, foodstuff, uniforms, bedding, and so on have been omitted from the table.
a. For Addis Ababa, the source data are not broken down by the subcycles shown; for our purpose, we estimate the desired breakdown by prorating spending according to shares of enrollments in the relevant subcycles.
b. Estimate based on assumption that teacher remunerations are the same as in Afar, another region where teacher pay is augmented by a 30 percent increase as hardship allowance.
c. Excludes data for Somali (for reason noted in previous footnote), Benshangul-Gumuz and Gambella (because unavailable), and spending by the federal government.
Source: Authors' estimate of the wage bill for teachers and other staff using data from the Ministry of Education's 2001–02 Ethiopia school census and reported MOFED data on spending on educational supplies and other nonwage items.

Relation between Spending and Primary School Completion Rates

The success of an educational system depends not only on the amounts spent but even more importantly on the outcomes achieved by the education system. One measure of outcome is the primary school completion rate. For the amount that Ethiopia spends on primary education, how does the country's primary school completion rate compare with that of other countries? For this comparison, we use data for a large number of countries to relate recurrent spending on primary schooling (expressed as a percentage of the GDP) and primary school completion ratio (Figure 3.2). Because Ethiopia's primary cycle lasts eight

Figure 3.2. Relation between Public Spending on Primary Education and Completion Rates, Ethiopia and Other Countries, circa 2000



Note: Data for Ethiopia, which has an eight-year primary cycle, have been adjusted for six years of primary schooling, to match the five or six years for the other countries in the sample. For all countries, completion rates refer to cross-sectional estimates.

Source: For Ethiopia, table 3.8 and appendix table A3.2 (for the GDP) and chapter 2; for other countries, Bruns, Mingat, and Rakotomalala 2003.

years whereas in most other countries it usually lasts six years the data for Ethiopia in the figure have been adjusted accordingly.[52] African countries tend to achieve lower rates of primary school completion for given levels of spending, and Ethiopia is no exception. Among African countries with completion rates below 50 percent, Ethiopia's spending of 1.2 percent of its GDP on primary education (prorated to six years) is at about the average level in the sample. This cross-country perspective raises questions regarding the efficiency of public spending on primary education in Ethiopia, as it does in many other African countries. It implies that even as more resources are mobilized for the sector and for primary education in particular, it is important to improve the way resources are spent. Limiting the growth of spending on administrative overheads and increasing the share of spending on educational materials are two potentially useful directions to explore. Improvements might also require a better management of tradeoffs among school inputs, a subject to be explored in later in this chapter.

52. Thus, the primary school completion rate shown in the figure refers to completion of grade 6. The corresponding spending is calculated by prorating spending on administration across all levels of education in proportion to their share of nonadministration spending. On this basis, spending on grades 1–4 and 5–8 amounted to 32.2 and 23.2 percent, respectively, of total recurrent public spending. Splitting the amount in grades 5–8 evenly by grade yields spending on grades 1–6 that is equivalent to 1.2 percent of GDP, given a total spending of 2.8 percent of GDP.

Public Spending Per Student by Level and Type of Education

Using the foregoing estimates of aggregate spending, we can now compute the spending per student by level and type of education. These results are presented and discussed in this section, beginning with the overall national estimates and followed by estimates at the regional level.

National and Regional Estimates

The available data permit estimation of the cost per student in both cycles of primary education, secondary education, TVET, TTIs, TTCs, and higher education. As already noted, the data for TVET reflect budget amounts and may be biased by transitory influences associated with the initial phase of expansion of this relatively new sector; moreover, the student counts may be incomplete at this early stage of rationalizing the collection of data from schools offering TVET. Thus, although the estimates for this subsector are included for the sake of completeness, they should be treated with caution. For primary and secondary education, the discussion below also examines the sources of differences in unit spending across subcycles; cross-country data are presented when available to put Ethiopia's level and structure of unit spending in perspective.

Spending per Student by Level and Type of Education. The estimates are displayed in Table 3.11. Excluding administrative overheads at the federal and regional levels, recurrent public spending per primary pupil in 2001–02 averaged 86 Birr in grades 1–4 and 160 Birr in grades 5–8. Per student spending in secondary education was 2.6 times the average for the primary cycle, a multiple that is within the range observed in low-income countries based on data for the mid-1990s. The cost per student mount rapidly, however, in teacher training institutions and in higher education—ranging from 32 times as high as the per pupil spending in primary education for TTIs to 88 times as high for higher education. That spending per student rises with level of education is not unusual; the real issue is how steep the increase is.

Mingat and Suchaut (2000) report the following patterns for a large number of countries from the mid-1990s: public spending per higher education student as a multiple of the corresponding figure for primary averaged 63 times in Anglophone Africa (nine countries); 37 times in Francophone Africa (15 countries); 10 times in Latin America (10 countries); 11 times in Asia (8 countries); and 8 times in the Middle East (8 countries). More recent data from the 2000s for Madagascar and Rwanda show the ratio at 20 and 95 times, respectively (World Bank 2002 and 2003d). Ethiopia's structure of spending thus appears to be more skewed in favor of higher education than that in most other low-income countries. While the result may be explained by various underlying factors, including the fact that more of the inputs in higher education must be bought at international prices, it should still serve as a signal regarding the importance of and possible need for cost management in higher education (and indeed also in the TTIs and TTCs).

Cross-country Comparison of Spending per Primary Pupil. The estimates for primary education can be compared with data for around 2000 for a large group of African

Table 3.11. Public Recurrent Spending Per Student by Level and Type of Education in Government Institutions, Ethiopia, 2001–02

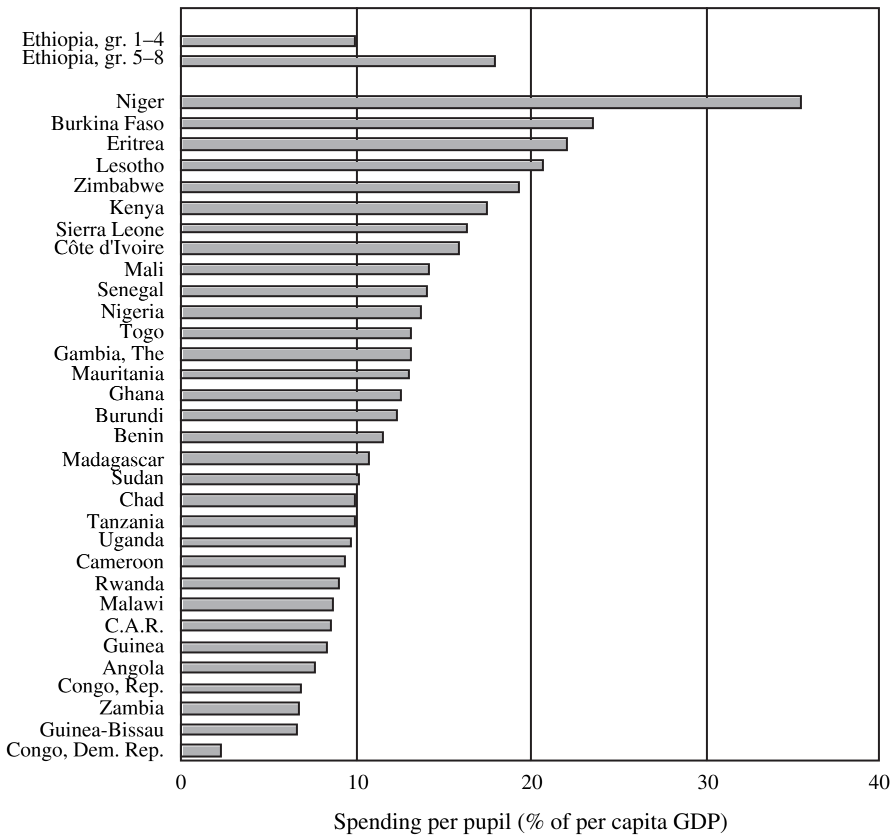
of Education Level/type	Total recurrent public spending (millions of current Birr)[a/]	Number of students in government institutions	Spending per student: Amount in current Birr	Spending per student: As multiple of per capita GDP[b/]	As multiple spending per primary pupil: Grades 1–4 = 1.0	As multiple spending per primary pupil: Grades 1–8 = 1.0
Primary (grades 1–8)[c/]	785.8	7368038	107	0.12	1.2	1.0
Grades 1–4	457.1	5,311,949	86	0.10	1.0	0.8
Grades 5–8	328.7	2,056,089	160	0.18	1.9	1.5
Secondary (grades 9–12)[c/]	185.6	655,664	283	0.32	3.3	2.7
Tech./voc. education & training[d/]	*91.1*	*36,462*	*2,499*	*2.85*	*29.0*	*23.4*
Teacher training institutes	21.2	6,080	3,495	3.98	40.6	32.8
Teacher training colleges	22.7	3,618	6,267	7.13	72.8	58.8
Higher education[e/]	265.4	27,924	9,504	10.82	110.4	89.1

Note: Data for Benshangul-Gumuz and Gambella excluded for reasons explained in Technical Note 1.
a. Data exclude administrative overheads at federal and regional levels.
b. For our purpose here, the per capita GDP of 878.3 Birr was calculated by dividing the estimated GDP of 59.11 billion Birr in 2001–02 by the projected population of 67.3 million.
c. Data exclude Somali to ensure consistency with data presented later for the decomposition of unit spending.
d. Data are shown in italics to alert the reader that spending on this subsector refers to the amount reported in MOFED budget data, and that the estimate of unit spending may be unreliable because of possible incomplete counts of enrollments.
e. Refers to estimates for 19 institutions of higher education; number of students excludes those in postgraduate studies.
Source: Analysis of the wage bill for personnel at the school level using data from the 2001–02 Ethiopia school census and reported MOFED data on the wage bill of staff in federal and regional administration and on nonsalary items of spending.

countries (Figure 3.3).[53] Expressed in relation to per capita GDP, Ethiopia's per pupil spending in grades 1–4 is somewhat smaller than the average for primary schooling in African countries, while the corresponding figure for grades 5–8 is unambiguously higher. As will be documented in a later section, the differences in costs per pupil between the two cycles in primary education reflect underlying differences in the arrangements for service delivery.

53. For the cross-country comparisons, the estimates of unit spending in grades 1–4 and 5–8 in Figure 3.3 include administrative overheads at the federal and regional levels. The costs of these items are assigned by level or type of education by prorating the aggregate amount in proportion to the relevant shares of nonadministration spending.

Figure 3.3. Spending Per Pupil in Primary Education, Ethiopia and Other African Countries, circa 2000



C.A.R. Central African Republic; Congo, Dem. Rep. Democratic Republic of the Congo; Congo, Rep. Republic of Congo.

As a digression, we note that although the cross-country comparisons can be made on the basis of unit spending expressed in absolute terms in a common currency (for example, U.S. dollars)—which may be more easily understood—we chose instead the option of comparing unit spending expressed relative to the per capita GDP of each country. The advantage of expressing unit spending thus is that it immediately identifies countries that are likely to encounter fiscal constraints in expanding the coverage of their education system.

To elaborate, consider the following set of accounting identities for primary education where PEP refers to recurrent public expenditure on primary education; GDP, to gross domestic product; α, to primary education's share of public recurrent spending on education at all levels (PEE); TPOP, to total population; E, to total enrollments in primary education; SAPOP, to the school-age population (ages 7–14 in Ethiopia); US, to spending per primary pupil; GER, to the primary gross enrollment ratio; DR, to the ratio of the school-age population to the total population; and PCGDP, to the per capita GDP:

$$
\begin{aligned}
\frac{PEP}{GDP} &= \alpha \cdot \frac{PEE}{GDP} \\
&= \frac{PEP}{TPOP} \cdot \frac{TPOP}{GDP} \\
&= \frac{PEP}{E} \cdot \frac{E}{SAPOP} \cdot \frac{SAPOP}{TPOP} \cdot \frac{TPOP}{GDP} \\
&= US \cdot GER \cdot DR \cdot \frac{1}{PCGDP} \\
&= \frac{US}{PCGDP} \cdot GER \cdot DR
\end{aligned}
$$

Rearranging the terms in the first and last equations, and renaming US/PCGDP as USR (to stand for unit spending relative to the per capita GDP), we obtain an expression that relates the GER to its underlying components, as follows:

$$GER = \alpha \cdot \frac{PEE}{GDP} \cdot \frac{1}{USR} \cdot \frac{1}{DR}$$

The equation above makes the relatively obvious statement that the GER would be higher, the larger primary education's claim is on total recurrent spending, the larger the volume of spending is on education relative to the GDP, the smaller spending per student is relative to the GDP, and the smaller the share of the school-age population is relative to the total population.

To anticipate cross-country comparisons of involving teacher salaries, the foregoing disaggregation can be further developed to demonstrate the relevance of expressing salaries relative to the per capita GDP as well. In particular, USR can be expressed as follows, where TTS refers to aggregate spending on teacher salaries in primary education; T, to the total number of primary school teachers; ATS and ATSR, to average teacher salaries expressed in absolute terms and relative to the per capita GDP, respectively; β, to the share of teacher salaries in aggregate spending on primary education; and PTR, to the ratio of pupils to teachers in primary education:

$$
\begin{aligned}
USR &= \left[\frac{PEP}{E}\right] \cdot \frac{1}{PCGDP} = \frac{TTS}{E} \cdot \frac{1}{(TTS/PEP)} \cdot \frac{1}{PCGDP} \\
&= \frac{T \cdot ATS}{E} \cdot \frac{1}{\beta} \cdot \frac{1}{PCGDP} \\
&= \frac{ATS}{PCGDP} \cdot \frac{1}{(E/T)} \cdot \frac{1}{\beta} = ATSR \cdot \frac{1}{PTR} \cdot \frac{1}{\beta}
\end{aligned}
$$

Plugging this expression for USR in the earlier equation for the GER, we obtain yet another formulation of the relationship between the GER and its underlying components, as follows:[54]

$$GER = \alpha \cdot \frac{PEE}{GDP} \cdot \beta \cdot \frac{1}{ATSR} \cdot PTR \cdot \frac{1}{DR}$$

According to the above equation, the higher teachers salaries are relative to the per capita GDP, the smaller is the GER, all else being the same.[55] Because of this relationship, it is particularly useful in cross-country comparisons of teacher salaries to express them in this unit rather than in absolute terms.

Regional Spending per Student in Primary and Secondary Education. Across regions, per pupil spending in 2001–02 was consistently lowest in Tigray across all levels of schooling and consistently highest in Afar (followed not far behind by Harari; Table 3.12). In grades 1–4, expen-

Table 3.12. Public Spending Per Student in Government Primary and Secondary Schools across Regions, Ethiopia, 2001–02

	Spending per student (Birr)			Index (Ethiopia = 1.0)			Index (grades 1–4 = 1.0)	
Region	Grades 1–4	Grades 5–8	Grades 9–12	Grades 1–4	Grades 5–8	Grades 9–12	Grades 5–8	Grades 9–12
Tigray	77	126	205	0.9	0.8	0.7	1.6	2.6
Afar	302	456	1,852	3.5	2.8	6.5	1.5	6.1
Amhara	86	129	239	1.0	0.8	0.8	1.5	2.8
Oromiya	84	177	372	1.0	1.1	1.3	2.1	4.4
Somali[a/]	148	402	557	1.7	2.5	2.0	2.7	3.8
SNNPR	78	159	168	0.9	1.0	0.6	2.0	2.2
Harari	254	412	579	2.9	2.5	2.0	1.6	2.3
Addis Ababa	174	200	251	2.0	1.2	0.9	1.1	1.4
Dire Dawa	199	190	343	2.3	1.2	1.2	1.0	1.7
Ethiopia[b/]	86	160	283	1.0	1.0	1.0	1.9	3.3

SNNPR Southern Nations and Nationalities Peoples Republic.
Note: Estimates refer to regular programs in government schools; data for Benshangul-Gumuz and Gambella unavailable for reasons explained in Technical Note 1.
a. Estimate based on assumption that teacher remunerations are the same as in Afar, another region where teacher pay is augmented by a 30 percent increase as hardship allowance.
b. Weighted national average excludes Benshangul-Gumuz, Gambella, and Somali.
Source: Analysis of the wage bill for personnel at the school level using data from the 2001–02 Ethiopia school census and reported MOFED data on spending on nonsalary items.

54. For primary education, the values for the right-hand-side variables in 2001–02 were as follows: $\alpha = 0.502$, (PEE/GDP) = 0.03; $\beta = 0.912$; ATRS = 7.2; PTR = 65; and DR = 0.203, which imply a GER of 0.611, which is very close to the actual rate of 0.616.

55. The equation can be used, for example, to compare the sources of differences in the coverage of two education systems, or the same system at two points in time. See, for example, Mingat and Tan (2003) for an example of this kind of analysis.

diture per pupil in Amhara, Oromiya, and SNNPR was comparable or just slightly higher than in Tigray. By contrast, the figure was 4 times the national average in Afar, and between 2 and 3.5 times in Harari, Addis Ababa, and Dire Dawa. In grades 5–8, per student spending ranged between 80 and 100 percent of the national average in Tigray, Amhara, Oromiya, and SNNPR, while Afar's figure was nearly 3 times as high as the national average. In grades 9–12, spending per student stood below the national average in Tigray, Addis Ababa, Amhara, and SNNPR, while it was nearly twice the national average in Harari, and an exceptional 6.5 times in Afar.

Within each region, expenditure per student typically rises, as expected, with the level of education. The increase is steeper, however, in some regions than in others. In Tigray per student spending in grades 5–8 and grades 9–12 was, respectively, 1.6 and 2.6 times that in grades 1–4. The increase between grades 1–4 and grades 5–8 was steeper in Oromiya and SNNPR than in Tigray, while spending per student was essentially the same between the two cycles in Addis Ababa and Dire Dawa. Between grades 1–4 and grades 9–12, the increase was steepest in Afar and Oromiya, where the ratio was, respectively, more than 6 times and nearly 4.5 times.

Decomposition of Spending Per Student in Primary and Secondary Education

What factors account for the differences in spending per student across levels and regions described above? Examining this issue more closely can help in evaluating the cost implications of alternative service delivery options. Because primary and secondary schooling make up the bulk of the system, we shall focus on these levels of the education system.

Setting Up the Analysis. We begin with a few algebraic expressions to show the relation among the key components of spending per student. At a given level of education, overall recurrent spending (OS) may be written as follows:

$$OS = \sum_i S_i$$

where OS is overall spending, S_i is spending on component i. Because teacher salaries are the main component of spending, we may express OS as follows:

$$OS = \frac{1}{\alpha} \cdot TS$$

where α is the share of teacher salaries in overall spending, and TS is total teacher salaries. Dividing OS by the number of students (S), we obtain the spending per student (US), as follows:

$$US = \frac{OS}{S} = \frac{1}{\alpha} \cdot \frac{TS}{S}$$

The last item in the equation, TS/S, is simply the spending on teachers per student, and it can in turn be expressed as a function of two components—the average salary of teachers

(AST) and the student-teacher ratio (STR, which is itself obtained by dividing the number of students, S, by the number of teachers, NT), as follows:

$$US = \frac{1}{\alpha}\cdot\frac{1}{\alpha}\cdot\frac{TS}{S} = \frac{1}{\alpha}\cdot\frac{AST\cdot NT}{S} = \frac{1}{\alpha}\cdot AST\cdot\frac{1}{(S/NT)} = \frac{1}{\alpha}\cdot\frac{AST}{STR}$$

We can further write STR as a function of the average section size (SS), the average teaching load of teachers (TH), and the average instructional hours received by students (SH), as follows:

$$STR = SS\cdot\frac{TH}{SH}$$

Substituting this expression of the student-teacher ratio into the preceding equation for unit spending, we obtain the following disaggregation:

$$US = \frac{1}{\alpha}\cdot\frac{AST}{STR} = \frac{1}{\alpha}\cdot\frac{AST}{SS}\cdot\frac{SH}{TH}$$

This equation provides a precise decomposition of spending per student. Below we use it in two ways: (a) to estimate teaching loads across levels of education;[56] and (b) to compare the sources of differences in spending per student across levels or types of schooling, and across regions (or countries) at the same level of education.[57]

Estimates of Teaching Loads. Table 3.13 shows the data and results for grades 1–4, grades 5–8, and grades 9–12. Data for the variables in the first three rows were presented earlier and need no further explanation. Data on student-teacher ratios and section sizes are weighted averages based on the 2001–02 Ethiopia school census. Students' weekly instructional hours are estimated from information about the instructional program in primary and secondary schools according to the number of shifts operated by the school and data on the distribution of schools by the number of shifts. The data in the table imply the following weekly teaching loads: 24.0 hours in grades 1–4 (=(75.2/77.0) × 24.6), 17.2 hours in grades 5–8, and 15.0 hours in grades 9–12. In statistical analyses of this nature, it is important to recognize that the accuracy of these estimates depends on the reliability of the underlying parameters. As the teaching load is computed as a residual variable, it inevitably "absorbs" the inaccuracies of the three variables (namely, student-teacher ratio, section size, and student's weekly instructional hours). On balance, the

56. This calculation is possible because data are available (or can be estimated) for all the other variables in the equation.

57. For example, the unit spending per student in level j (or region j) relative to that in level i (or region i) may be expressed as follows: $\frac{US_j}{US_i} = \frac{\alpha_i}{\alpha_j}\cdot\frac{AST_j}{AST_i}\cdot\frac{STR_i}{STR_j} = \frac{\alpha_i}{\alpha_j}\cdot\frac{AST_j}{AST_i}\cdot\frac{SS_i}{SS_j}\cdot\frac{SH_j}{SH_i}\cdot\frac{TH_i}{TH_j}$. Thus, spending per student in level j relative to that in level level i may be expressed as the product of the relevant ratios of the variables in the equation. To facilitate the reading of Tables 3.14 to 3.16, the various ratios are listed in the same sequence as in this expression.

Table 3.13. Estimates of Teaching Loads by Level of Education, Ethiopia, 2001–02

Item	Expression in text equations	Grades 1–4	Grades 5–8	Grades 9–12
Overall spending per student (Birr / year)[a/]	OS/S	86	160	283
Components of spending on teachers per student				
Share of total recurrent spending on teachers	α	92.2	89.7	71.0
Average remuneration of teacher (Birr/year)[b/]	AST	5,987	7,005	10,341
Student-teacher ratio	STR	75.2	48.8	51.5
Average section size	SS	77.0	68.0	82.6
Students' weekly instructional time (hours)[c/]	SH	24.6	24.0	24.1
Teachers' weekly teaching load (hours)[d/]	**TH**	**24.0**	**17.2**	**15.0**

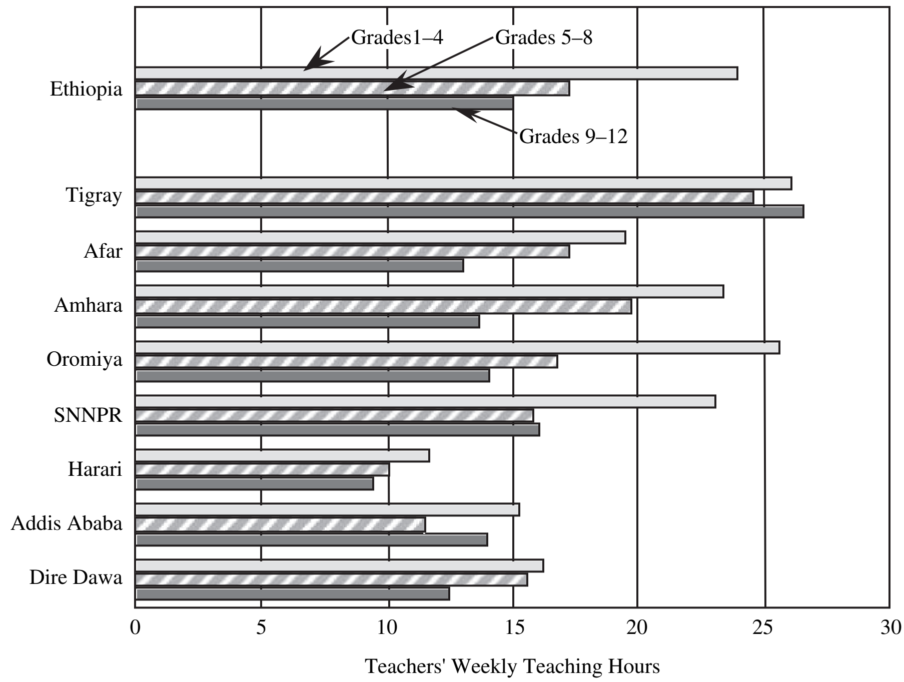
Note: Data for Somali, Benshangul-Gumuz, and Gambella excluded for reasons explained in text.
a. Excludes spending on administration at the level of the federal ministry and the regional bureaus.
b. Includes cost of pensions and allowances.
c. Estimated based on distribution of schools by number of shifts, and the following information on the instructional hours received by students: 35 periods (of 45 minutes each) per week for students (all grades) in schools operating single shifts, and 30 periods per week in schools operating double or more shifts, except for students in grades 11–12 where the instructional program is 33 periods per week.
d. Evaluated using data in the preceding rows and method described in text.
Source: Overall spending per student, Table 3.11; all other variables, analysis of the Ministry of Education's 2001–02 school census; see also Technical Note 1 for estimation of average teacher salaries.

impact of such inaccuracies may cancel out and leave estimates of teaching loads that are reasonably accurate, even if imprecise.[58] For comparison, data for 1999 for a group of 17 lower-middle-income countries show the following weekly teaching loads: 21.6 hours in primary education, 20.0 hours in lower secondary education, and 19.1 hours in upper secondary education (UNESCO-UIS/OECD 2002).

Applying the same procedure to the regional data in Appendix Table A3.6, we obtain estimates of the teaching loads by level of schooling and region (Figure 3.4). Tigray stands out among the regions in that teaching loads appear to be comparably high in both primary and secondary education—just over 25 hours a week. The opposite pattern is true in Harari: teaching loads vary from about 12 hours weekly in primary education to only 9.5 hours in secondary education. In Addis Ababa and Dire Dawa, teaching loads in grades 1–4 are also much lower than in the other regions, averaging around 15 hours weekly. As will be evident from the analysis in the next section, differences in teaching loads are an important factor behind regional disparities in spending per student.

58. The 2002–03 school census for Oromiya Region provides an independent source of information on teachers' teaching load. The data show the following weekly teaching loads: 26.0 hours for teachers in grades 1–4 and 20.6 hours for teachers in grades 5–8. The estimates for this region using the method described above are as follows: 25.6 hours in grades 1–4 and 16.8 hours in grades 5–8. The discrepancy for the estimate for grades 5–8 is sufficiently large to suggest that the estimates of teaching loads should be treated as valid only for describing broad patterns of the time utilization of teachers in this region.

Figure 3.4. Estimated Teachers' Weekly Teaching Hours in Government Primary and Secondary Schools, Ethiopia, 2001–02



Note: Estimates unavailable for Somali, Benshangul-Gumuz, and Gambella.

Source: Analysis of data in appendix table A3.6 using method described in text.

Sources of Differences in Spending per Student Across Levels. The relevant data and results are shown in Table 3.14.[59] Consider first the comparison between grades 1–4 and grades 5–8. Overall spending per pupil in the second cycle is 1.86 times that in the first cycle. The cost is higher in grades 5–8 because: (a) teacher salaries comprise a smaller share of total recurrent spending (which implies more spending on nonsalary inputs); (b) teachers cost more; and (c) the average student-teacher ratio is lower. Recalling the algebraic expressions presented earlier, we see that the difference in the share of the teacher wage bill between the two cycles would, all else being the same, raise spending per student in grades 5–8 by a factor of 1.03 (=92.2/89.7). With regard to the remuneration of teachers, the impact is a factor of 1.17 (=7,013/5994), that is, the ratio of the salaries of teachers in grades 5–8 relative to that of teachers in grades 1–4. In the case of the student-teacher ratio, the impact is to raise per student spending by a factor 1.54 (=74.8/48.3), the ratio between the relevant student-teacher ratios. Using the algebraic relationships established earlier, we can see that the combined influence of these three factors is to boost per student spending in grades 5–8 to

59. Recall here that the spending excludes the cost of administration at the level of the federal ministry and the regional bureaus. The focus is thus on the way resources are used at the level of schools.

Table 3.14. Sources of Differences in Spending Per Student in Government Primary and Secondary Education, Ethiopia, 2001–02

				Indices		
				Grades 5–8	Grades 9–12	
Indicators	Grades 1–4	Grades 5–8	Grades 9–12	(grades 1–4 = 1.00)	(Grades 1–4 = 1.00)	(Grades 5–8 = 1.00)
Overall spending per student (Birr / year)[a/]	86	160	283	1.86	3.29	1.77
Components of spending on teachers per student						
Inverse of share of recurrent spending on teachers (%)[b/]	1/92.2	1/89.7	1/70.0	1.03	1.30	1.26
Average remuneration of teacher (Birr / year)[c/]	5,987	7,005	10,341	1.17	1.73	1.48
Inverse of average pupil-teacher ratio	1/75.2	1/48.8	1/51.5	1.54	1.46	0.95
Inverse of average section size	1/77.0	1/68.0	1/82.6	1.13	0.93	0.82
Students' weekly instructional time (hours)[d/]	24.6	24.0	24.1	0.98	0.98	1.00
Inverse of teachers' weekly teaching load (hours)[e/]	1/24.0	1/17.2	1/15.0	1.39	1.60	1.15

a. Excludes spending on overall system administration at the federal ministry and the regional bureaus, but includes spending on administrative staff in schools.
b. The complement includes spending on administrative staff at the school level and nonstaff inputs.
c. Includes pension and allowances.
d. Estimated based on distribution of schools by number of shifts, and the following information on the instructional hours received by students: 35 periods (of 45 minutes each) per week for students (all grades) in schools operating single shifts, and 30 periods per week in schools operating double or more shifts, except for students in grades 11–12 where the instructional program is 33 periods per week.
e. Estimated using data in previous rows based on method described in text.
Source: Based on analysis of data in Table 3.13.

1.86 times (=1.03 × 1.17 × 1.54) that in grades 1–4. This aggregation shows that the 86 percent difference in spending per student between the two levels derives by and large from differences in the student-teacher ratio. Further disaggregation of the latter variable, shown in the lower half of the table, reveals that while the smaller section sizes in grades 5–8 contribute to a 13 percent increase in spending per student in grades 5–8, it is the smaller teaching loads of teachers at this level that make the biggest difference, contributing to an increase of 39 percent. Overall, it is indeed the single most important source of the difference in spending per student between the two cycles of primary schooling. Since specialized teaching is introduced in grades 5–8, this analysis provides a way to assess the cost implication of this arrangement. For example, all else being the same, raising teaching loads in the cycle to 24 hours per week, the same as in grades 1–4, would reduce spending per student in grades 5–8 by 28 percent. If this cost reduction were achieved in just two of the four years in grades 5–8, the savings would be sufficient to provide an extra 55,540 places in grades

1–4 at the prevailing cost of 86 Birr per pupil—equivalent to about 6 percent of the enrollments in grade 5 in 2002–03.[60]

The table above also shows the results of a similar decomposition of spending per student in grades 9–12 relative to that in grades 1–4 and grades 5–8. Focusing on the comparison between grades 5–8 and grades 9–12 (last column in the table), we note that spending per student differs between the two levels by a factor of 1.77. The higher spending in grades 9–12 is accounted for as follows: an increase of 26 percent because the wage bill accounts for a smaller share of total recurrent spending, an increase of 48 percent attributable to higher levels of teacher remuneration, a decrease of 18 percent because of larger section sizes, and an increase of 15 percent because of lower teaching loads. The differences in teacher remuneration is now the dominant source of the difference in spending per student between grades 9–12 and grades 5–8. The difference in spending on nonteacher inputs is also relatively important, but that in teaching loads makes only a modest impact.

Sources of Spending Gaps Across Regions by Cycle of Schooling. We now examine the sources of differences across the regions, focusing on grades 1–4 and grades 5–8.[61] Again using the algebraic expressions discussed above, we can compare the overall spending per student of any two localities by computing the ratios between each of the component variables. For ease of presentation, these comparative ratios are computed for each region using Ethiopia as the reference (Table 3.15).

Consider first the patterns in grades 1–4. Two sets of regions may be distinguished. The first consists of Tigray, Amhara, Oromiya, and SNNPR which are all characterized by an overall spending per student that is at or below the national average. Tigray is unique in this group, however, in that its cost structure involves a tradeoff between teacher remuneration and the student-teacher ratio; as well as between section size and teaching load. In particular, Tigray's average teacher remuneration is 82 percent as high as the national average (whereas the indicator is slightly above the national average in the other three regions); this frees up its resources to achieve the lowest student-teacher ratio in the group (70.3 compared with the country-wide average of 75.2). Moreover, by keeping teaching loads at 26.1 hours instead of the average of 24 hours, Tigray also has the lowest section sizes in the group (64.9 compared with the national average of 77.0).[62]

In the second group of countries—Afar, Harari, Addis Ababa, and Dire Dawa—overall spending per student is between 2 and 3.5 times the national average. Teacher remuneration is a relatively unimportant factor as to why spending per student is much higher in these regions: Afar and Dire Dawa have above-average levels of teacher remuneration, but the impact is to raise spending per student by only 18 and 8 percent, respectively; in Harari and

60. The calculation is obtained as follows. If teaching loads are the same in grades 5–8 as in grades 1–4 and all other factors remain unchanged, the overall spending per student would be higher by a factor of only 1.33 (=1.03 × 1.17 × 1.13 × 0.98). This implies a unit spending of 144.7 Birr per student. In 2001–02, there were 2,116,756 students in grades 5–8. If half of them are taught by teachers with the fuller teaching load, the total savings would be 47.8 million Birr (=(160–144.7) × 0.5 × 2,116,756)). At the cost of 86 Birr per student in grades 1–4, the savings would finance 55,540 places.

61. The same exercise can be conducted for grades 9–12 but the results are not reported here to economize on space. Furthermore, the regional breakdown is less useful since there are only some 300 public secondary schools nationwide.

62. See Appendix Table A3.6 for additional details.

Table 3.15. Sources of Regional Differences in Spending Per Student in Grades 1–4 and Grades 5–8 Across Regions, Ethiopia, 2001–02

	Index (Ethiopia =1.00)[b/]						
		Components of spending per student					
Grades and region[a/]	Overall spending per student (Birr / year)	Inverse of share of recurrent spending on teachers	Average remuneration of teacher (Birr/year)	Inverse of student-teacher ratio	Inverse of average section size	Students weekly instructional hours	Inverse of teachers' weekly teaching load (hours)
Grades 1–4							
Tigray	0.90	1.03	0.82	1.07	1.19	0.98	0.92
Afar	3.50	1.29	1.18	2.32	1.81	1.04	1.23
Amhara	1.00	0.96	1.05	1.00	0.98	0.99	1.03
Oromiya	0.98	1.02	1.01	0.95	1.00	1.01	0.94
SNNPR	0.91	0.95	1.01	0.95	0.91	1.00	1.04
Harari	2.96	1.26	0.85	2.76	1.37	0.98	2.05
Addis Ababa	2.02	1.23	0.91	1.80	1.24	0.93	1.57
Dire Dawa	2.31	1.15	1.08	1.86	1.25	1.00	1.48
Grades 5–8							
Tigray	0.79	1.09	1.03	0.70	1.01	0.99	0.70
Afar	2.85	1.37	1.20	1.74	1.64	1.06	1.00
Amhara	0.81	0.95	1.02	0.84	0.97	0.99	0.87

(*continued*)

Table 3.15. Sources of Regional Differences in Spending Per Student in Grades 1–4 and Grades 5–8 Across Regions, Ethiopia, 2001–02 (*Continued*)

	Index (Ethiopia =1.00)[b]						
		Components of spending per student					
Grades and region[a]	Overall spending per student (Birr / year)	Inverse of share of recurrent spending on teachers	Average remuneration of teacher (Birr/year)	Inverse of student-teacher ratio	Inverse of average section size	Students weekly instructional hours	Inverse of teachers' weekly teaching load (hours)
Oromiya	1.11	1.01	1.04	1.06	1.03	1.01	1.03
SNNPR	1.00	0.96	0.98	1.06	0.97	1.00	1.09
Harari	2.58	1.09	1.10	2.15	1.26	1.00	1.70
Addis Ababa	1.25	1.17	0.77	1.39	0.99	0.94	1.50
Dire Dawa	1.19	0.98	1.07	1.13	1.03	0.99	1.10
Memoranda:[c]							
Ethiopia, grades 1–4	86	1/92.5	5,987	1/75.2	1/77.0	24.6	1/24.0
Ethiopia, grades 5–8	160	1/89.8	7,005	1/48.8	1/68.0	24.0	1/17.2

SNNPR Southern Nations and Nationalities Peoples Republic.
a. Data incomplete for Somali, Benshangul-Gumuz, and Gambella and therefore not shown.
b. Indices computed by expressing the values for each region relative to the values for Ethiopia (shown as memoranda items in this table).
c. Ethiopia average excludes data on all variables for Somali, Benshangul-Gumuz, and Gambella; see source table for the data for these regions.
Source: Based on data in Appendix Table A3.6.

Addis Ababa, teacher remuneration is below the national average, so this factor actually reduces spending per student by 15 and 9 percent, respectively. What raises spending per student in this group of regions is their smaller shares of total spending on teachers (implying more spending on items other than teachers), and their more favorable student-teacher ratios (both because section sizes are smaller and because teachers teach fewer hours). Among these factors, smaller teaching loads are generally the most important factor, except in Afar where the difference in spending per pupil is due mainly to the region's much smaller section size relative to the national average.

In grades 5–8, Tigray and Amhara have the lowest spending per student, averaging around 80 percent of the national average. A look at the indices in the table reveals that the main reason for this result is that teaching loads are higher than average in these two regions. At the other end of the spectrum are Afar and Harari, the two highest-cost regions, whose spending per student are, respectively, 2.9 and 2.6 times the national average. In Afar, the fact that the teacher wage bill accounts for a smaller share of total spending (implying that more is spent on nonteacher inputs) would, all else being the same, raise overall spending per student by 37 percent above the national average, compared with an increase of only 9 percent in Harari. In both regions, the more favorable student-teacher ratios boost spending per student the most, by 74 percent above the national average in Afar, and 115 percent in Harari, all else being the same. Further disaggregation of this variable (in the last three columns of the table) reveals that the smaller student-teacher ratios in Afar are almost completely attributable to smaller section sizes and not at all to smaller teaching loads, whereas in Harari, it reflects both smaller section sizes and smaller teaching loads, the latter being the more important of the two factors. Addis Ababa and Dire Dawa are the other two high-cost regions. However, the reason why costs are high differs between them. In Addis Ababa, low teaching loads would have raised spending per student by 50 percent above the national average, all else being the same, but the impact of this factor is reduced by the fact that average teacher remuneration is only 77 percent as high as the nationwide average. In Dire Dawa, the higher-than-average costs reflect the combined influence of slightly better than average teacher remuneration and pupil-teacher ratios (itself a reflection of smaller-than-average section sizes and smaller teaching loads).

Sources of Spending Gaps Across Cycles of Schooling in Each Region. Here again we focus on the two cycles of primary schooling. Spending per student in grades 5–8 relative to that in grades 1–4 ranges from 1.15 in Addis Ababa, to 2.10 in Oromiya, and to 2.04 in SNNPR (Table 3.16). As before, the gaps in spending per student across the two cycles may be decomposed into three main factors (columns 4–6 in the table): the share of spending on teachers, average teacher remuneration, and the student-teacher ratio (which itself can be disaggregated into the average section size, students' instructional hours, and teachers' teaching hours, columns 7–9 in the table). In Oromiya and SNNPR, where the difference between the two cycles is widest, the main source of the higher spending in grades 5–8 is the more favorable student-teacher ratios at this level, which itself reflects more favorable section sizes and, most importantly, lower teaching loads. Tigray and Dire Dawa are the only regions where higher levels of teacher remuneration are the most important factor driving up spending per student in grades 5–8 relative to that in grades 1–4. Dire Dawa is unique in another way: it is the only region where there is no cost differential between the two cycles of primary schooling. It achieves this result by cutting down on nonteacher

Table 3.16. Sources of Differences in Government Spending Per Student across Cycles in Primary Education in Each Region, Ethiopia, 2001–02

		Values in grades 5–8 relative to values in grades 1–4						
			Components of spending on teachers per student					
Region	Overall spending per student, grades 1–4 (Birr/year)	Overall spending per student	Inverse of share of recurrent spending on teachers	Average remuneration of teacher (Birr/year)	Inverse of student-teacher ratio	Inverse of average section size	Students' weekly instructional hours	Inverse of teachers' weekly teaching load (hours)
Tigray	77	1.63	1.09	1.47	1.02	0.97	0.99	1.06
Afar	302	1.51	1.10	1.19	1.16	1.03	1.00	1.13
Amhara	86	1.50	1.02	1.14	1.29	1.12	0.98	1.18
Oromiya	84	2.10	1.01	1.21	1.72	1.16	0.98	1.52
SNNPR	78	2.04	1.04	1.13	1.73	1.20	0.99	1.46
Harari	254	1.62	0.89	1.51	1.20	1.04	0.99	1.16
Addis Ababa	174	1.15	0.98	0.99	1.19	0.90	1.00	1.33
Dire Dawa	199	0.96	0.88	1.16	0.94	0.93	0.97	1.04
Memorandum:								
Ethiopia[a/]	86	1.86	1.03	1.17	1.54	1.13	0.98	1.39

SNNPR Southern Nations and Nationalities Peoples Republic.
a. Excludes data for Somali, Benshangul-Gumuz, and Gambella for all variables; see source table for the data for these regions.
Source: See Appendix Table A 3.6.

spending and by allowing the student-teacher ratio in the second cycle to deteriorate relative to that in the first cycle.

Summary of the Pattern of Public Spending per Student

At 12 percent of the per capita GDP, Ethiopia's overall spending per primary pupil is comparable to the level in other countries. Within primary education, however, expenditure per pupil is barely more than half as high in the first cycle as in the second, mainly because pupil-teacher ratios are much higher in the first cycle. Across regions the patterns are also diverse, reflecting underlying variations in the cost of teachers and pupil-teacher ratios. Teacher remuneration varies within a relatively narrow range, so that most of the variation in spending per pupil can be attributed to regional differences in student-teacher ratios. Further disaggregation of the differences in student-teacher ratios shows that differences in teaching loads are an important factor behind the variation in spending per student. Where a region has managed to keep the lid on spending per student, it is generally the result of implicit tradeoffs between teacher costs and student-teacher ratios. In Tigray, for example, unit spending is held below the national average only by allowing pupil-teacher ratios to reach astronomical levels—around 70 or more pupils per teacher in both cycles of primary schooling. Where the tradeoff has not been managed, the results are very high levels of spending per student.

More broadly across the education system, the estimates presented above show that Ethiopia spends more than 100 times as much per student in higher education as on a pupil in grades 1–4. Although it is common for spending per student to climb as the level of education rises, the current structure of spending is more highly skewed in favor of higher education in Ethiopia than in other countries. Further study would be warranted (which might cover not just higher education but also TTIs and TTCs because of their relatively high spending per student) to explore the scope for reining in unit spending and rationalizing the allocation of spending among inputs.

Household Spending on Education

As in other countries, Ethiopian households complement the government's investment in education. Below we document the magnitude of their contribution, drawing on data from the most recent Ethiopia Household Income and Consumption Expenditure Survey available at the time of data analysis; and supplement the information with *ad hoc* estimates of spending on evening classes.

Estimates of Spending Per Student and Per Household. Table 3.17 shows the average amount that families pay for their children's education. Because the household survey collected data on each household's total spending on education without disaggregating the amount by level or type of schooling, the estimates of spending in primary and secondary education are based on the data for households where all the enrolled children attended the same level of schooling; at the primary level, sufficient observations were available in the dataset for a distinction to be made between government and nongovernment schools. The last

Table 3.17. Household Spending on Education by Level, Ethiopia, circa 2000

Item	Annual expenditure per enrolled child (Birr)[a/] Primary: Government	Primary: Non-government	Secondary	Higher	Overall annual expenditure per household (Birr)[b/]
Regular programs, 1999–2000					
Fees	4	89	68	—	29
Other expenditures	16	32	52	—	39
Total	20	121	120	—	68
Fees for evening programs, 2001–02[c/]	80–140	—	196–239	1,090	—
Memorandum:					
No. of households in survey	8,112	371	614	46	11,973
Average annual consumption expenditure per adult equivalent (Birr)	n.a.	n.a.	n.a.	n.a.	1,676

—Data not available.
n.a. Not applicable.
a. Based on spending in households where all enrolled children are attending the indicated type of school at the indicated level.
b. Figures refer to weighted average for households with at least one child in school.
c. Data refer to fees charged in evening programs offered on the premises of government facilities; range indicates differences in charges, including registration fees, according to grade enrolled in; for higher education, fees differ by field of study and number of credits for which students are registered. The nature of the available data permits only an average to be shown here.
Source: Spending on regular programs estimated from data from the 1999–2000 Ethiopia Household Income and Consumption Expenditure Survey; for evening program fees for primary and secondary programs, data collected by authors in field visits to schools; and for evening higher education program fees, data reported by 8 of the country's 19 higher education institutions (including Addis Ababa University which has by far the largest number of evening students) on total fee income from evening classes and number of evening students registered.

column in the table shows overall spending per household on education regardless of level or type of education.[63]

The data reveal that students pay fees even when they attend regular programs in government primary schools. The amount paid in government schools rises with the level of schooling—from 4 Birr per annum per enrolled child at the primary level, to 68 Birr at the secondary level in 1999–2000. At the primary level, however, fees accounted for 25 percent of total expenditure per enrolled child, compared with 57 percent at the secondary level.

63. It is unclear from the survey instrument whether or not household spending on evening programs was included in the data reported by households. We believe that they are more likely to be excluded or unreliably estimated for two reasons: (a) those attending evening programs are often working children who may not be living with their own families; and (b) there are too few observations of students in higher education (of any kind, let alone those in evening programs).

As expected, fees in nongovernment primary schools were much higher than those in government primary schools—more than 22 times higher—as were other expenditures, which were about twice as large. Those who attended evening programs in government primary and secondary schools paid substantially more in fees than those in the regular programs, in some cases even more than those in nongovernment primary schools. As expected, students in higher education paid much higher fees than students at the lower levels. Nevertheless, taking all levels and types of education into account, we found that households with at least one child enrolled spend an average of 68 Birr per household, or the equivalent of a mere 4 percent of the average consumption expenditure per adult equivalent of households.

Aggregate Estimates and the Composition of Household Spending. We use the foregoing information to estimate aggregate household spending on education and relate the results to spending by the government, as shown in Table 3.18.[64] Ethiopian households spent a total of almost 389 million Birr in 1999–2000, of which slightly more than half went for

Table 3.18. Aggregate Household Spending on Education, Ethiopia, 1999–2000

	Primary education (grades 1–8)[a/]		All levels[a/]	
Item of expenditure	Amount (in millions of Birr)	Percentage share	Amount (in millions of Birr)	Percentage share
Fees				
Regular programs	57.5	28.4	134.4	34.7
Evening programs	10.6	5.2	69.1	17.8
Subtotal	68.1	33.7	203.5	52.5
Books	56.7	28.0	76.9	19.8
School supplies[b/]	30.3	15.0	34.8	9.0
Unspecified	47.1	23.3	72.6	18.7
Total	202.2	100.0	387.8	100.0
Memorandum:				
Share of total household spending (%)	52.1		100.0	

Note: Data refer to 1999–2000 for all items except fees for evening programs for which the data are for 2001–02. In the absence of information on changes between 1999–2000 and 2001–02 in the cost of education services, no adjustments are made when adding the amounts shown above.
a. Includes spending in government and nongovernment institutions.
b. Includes spending on paper, notebooks, pencils, pens, erasers, and so on.
Source: Spending on all items except fees for evening programs, the 1999–2000 Ethiopia Household Income and Consumption Expenditure Survey; fees for evening programs based on fees per student by grade and number of students enrolled by grade; and fees from evening courses offered by government of higher education institutions.

64. Note that the household data pertain to 1999–2000 while the estimates of spending on evening programs, to 2001–02. In the absence of data on price movements in the education sector, we simply assumed that spending has held unchanged in absolute terms between 1999–2000 and 2001–02. We make this assumption so we can relate aggregate household spending to aggregate government spending in 1999–2000.

primary schooling. The large share of primary education is not surprising, because this subsector accounted for more than 90 percent of enrollment in government institutions. Across all levels and types of education, fees claimed a sizable part of total household spending—almost 53 percent. Books and supplies accounted for a further 30 percent. In primary education, household spending is skewed toward books and supplies. These items accounted for 43 percent of total household spending on primary education. Even so, fees remain a sizeable component, accounting for a share of some 33 percent. It is noteworthy that of the total contribution of households, more than half is spent on primary education.

Adding the foregoing estimates of household spending on education to the amount spent by the government at all levels, we obtain an estimate of the national spending on education (Table 3.19). In 1999–2000, household spending accounted for just under a fifth of the national total on primary education, and more than a quarter of the national total at the postprimary levels, for an overall share of about 22 percent for the system as a whole. As will be seen later in this chapter, this level of spending is modest by the standards of some low-income countries.

Table 3.19. National Spending on Education, Ethiopia, 1999–2000

	Aggregate spending (in millions of Birr)			Household spending as a percentage of the national total
Level of education	Household spending[a/]	Government recurrent spending[b/]	National total	
Primary education (grades 1–8)	202.2	822.0	1,024.2	19.7
Postprimary levels	185.6	521.2	706.8	26.3
All levels	387.8	1,343.2	1,731.0	22.4
Memorandum:				
Aggregate spending as a percentage of GDP	0.7	2.6	3.3	n.a.

n.a. Not applicable.

a. Includes spending by households on regular and evening programs in government and nongovernment institutions.

b. Spending in primary and postprimary levels excludes administrative overheads incurred by central offices at the federal and regional levels.

Source: Household spending, Table 3.19; government spending and GDP, Appendix Table A3.1

Issues for Policy Development

Since 2000, Ethiopia's government has been spending more on education, and aggregate public recurrent spending on education has now been restored to the 3 percent of GDP that prevailed in 1993–94. This prioritization of education in public spending is consistent with the government's commitment to poverty reduction. Looking to the future, we see several important questions arising: how can the country's goals in education, particularly that of universalizing primary school completion by 2015—a Millennium Development Goal endorsed by the Ethiopian government as well as more than 200 other nations—be realized in the context of the very real budget constraints faced by the sector? Would a simple scaling up of existing patterns of resource mobilization and allocation suffice to reach the goals, or would they need to be reshaped in order to sustain progress over the long term?

These are all complex issues that deserve to be evaluated in greater depth than has been possible in this chapter. Nonetheless, the analysis of education finance points to a probable need for rethinking the way resources for education are mobilized and used. In particular, a case exists for prioritizing spending on primary education even more than at present, and within primary education, tradeoffs in managing costs warrant serious consideration to ensure that the system can expand in a manner that is fiscally viable as well as pedagogically sound.

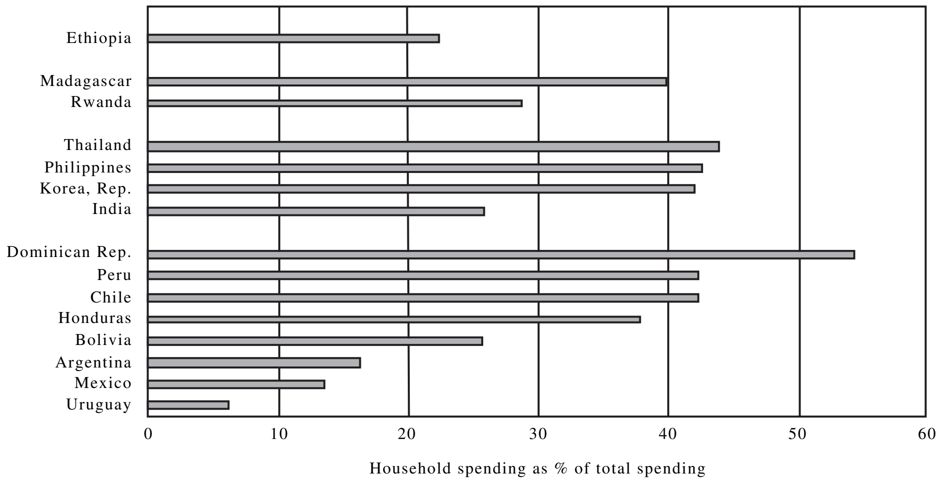
Prioritizing Primary Schooling in the Allocation of Public Spending on Education. As already noted in Chapter 1, there is reason to be optimistic about the prospects for increased public funds for education. Yet this optimism must be tempered by the observation that few developing countries have managed to sustain levels of recurrent spending on education beyond 4 or 5 percent of their GDP. Thus, if Ethiopia faces the same internal pressures as other low-income countries in managing revenue generation and resource allocation across sectors, the development of primary education would probably require a bigger share of public spending on education than it currently receives, even as overall resources for education rise above their current level of about 3 percent of the GDP. Ethiopia's eight-year primary cycle now accounts for about 50 percent of total recurrent spending. This share is modest compared with the international benchmark of 67 percent under the Education For All Fast Track Initiative, which is itself based on the pattern of spending in countries that have made good progress toward universalizing primary school completion (Bruns, Mingat, and Rakotomalala 2003).[65]

In order to prioritize public spending in favor of primary schooling, policies would be needed to mobilize household contributions for education at postprimary levels. The cross-country data in Figure 3.5 suggest that there is scope for increased contributions from households. Ethiopia's current level of spending is modest by Asian and Latin American standards; it is smaller than the share of about 40 percent in Madagascar and nearly 30 percent in Rwanda, two African countries for which recent data are available. Invariably, the higher shares of household contributions in these other countries can be explained by a much more developed privately financed system of secondary and higher education. As documented in Chapter 2, private higher education has flourished in recent years, and a continuation of this trend would be very helpful indeed in relieving pressure on the budget. In secondary education, the share of enrollments in privately financed institutions has been modest since the 1970s, averaging about 5 percent of the total. This level of participation is modest even by the experience in low-income countries. A useful direction for policy development would thus be to explore the scope and potential for encouraging the growth of this subsector.

An important consideration in mobilizing private household resources for education is to avoid increasing the burden on poor households. Indeed, if private funding for post-primary education is successfully mobilized, the result should be to free up public funds for primary schooling, perhaps even to eliminate the cost that families still face to enroll a child

65. In most countries, the primary cycle lasts six years; the benchmark under the Education For All Fast Track Initiative (EFA-FTI) is 50 percent for the subsector. For an eight-year cycle, this benchmark is increased proportionately to 67 percent, assuming unit costs are constant for the extra two years of schooling.

Figure 3.5. Household Spending as a Percentage of Total National Spending on Education, Ethiopia, 1999–2000, and Other Countries, circa 1998



Note: Total national spending refers to the combined recurrent spending by households and the government. Data refer to 1999 for Madagascar, and 2000 for Rwanda.

Source: Ethiopia, table 3.20; Madagascar, World Bank 2002; Rwanda, World Bank 2003; all other countries, World Bank EdStats database.

in primary school. In countries such as Kenya, Lesotho, Malawi, and Uganda, concern that costs may be keeping children from school has already led the governments in these countries to implement free primary education, despite the enormous logistical problems of implementation, as part of their poverty reduction strategies (Avenstrup 2004); and as of this writing, the list has grown to include additional countries pursuing a similar policy, including Madagascar, Rwanda, and Tanzania, to name a few. In Ethiopia, primary schooling is tuition-free, but families still incur other fees and charges to enroll their children. Survey data indicate that of the total amount that households currently spend on education, half is spent on primary schooling. Table 3.20 shows that although the amount per child in school averages about 3 percent of household consumption spending per adult equivalent, the pattern is regressive in that the burden is heavier on the poorest than richest households. Further, because poorer households tend to have more children, the combined financial burden of having more than two or three children at school could easily become unaffordable for such families.

Managing Tradeoffs Among Inputs in Primary Education. As already noted, Ethiopia's overall spending per primary pupil in grades 1–8 is in the middle of the range of spending observed in low-income countries. Its composition of spending differs, however, from the pattern in other countries, as Table 3.21 shows. In the first cycle, Ethiopia's recurrent public spending per pupil as a multiple of per capita GDP is comparable to that of Asian and Eastern European countries, but Ethiopia achieves the result by combining a much higher cost of teachers with a substantially less favorable pupil-teacher ratio and a significantly smaller share

Table 3.20. Household Spending Per Child in Primary School by Household Consumption Expenditure Quartile, Ethiopia, 1999–2000

Type of school	Annual education outlay per child[a] (Birr, unless otherwise indicated) Poorest quartile	2	3	Richest quartile
Government schools	21.9	27	36.5	57.2
Nongovernment schools	37.4	56.9	64.1	340.9
Weighted average	22.6	28.1	38.2	80.8
As a percentage of consumption expenditure per adult equivalent	3.3	2.6	2.5	2.4
Memorandum:				
Annual average consumption expenditure per equivalent adult	688	1,095	1,555	3,366

a. Includes expenditure on fees, books, school supplies, and other education-related items. The estimates are based on data for the 8,112 households in the sample that have children enrolled only in primary education in the indicated type of school. The estimates are underestimated to the extent that spending on evening programs is excluded.
Source: Analysis of the 1999–2000 Ethiopia Household Income and Consumption Expenditure Survey.

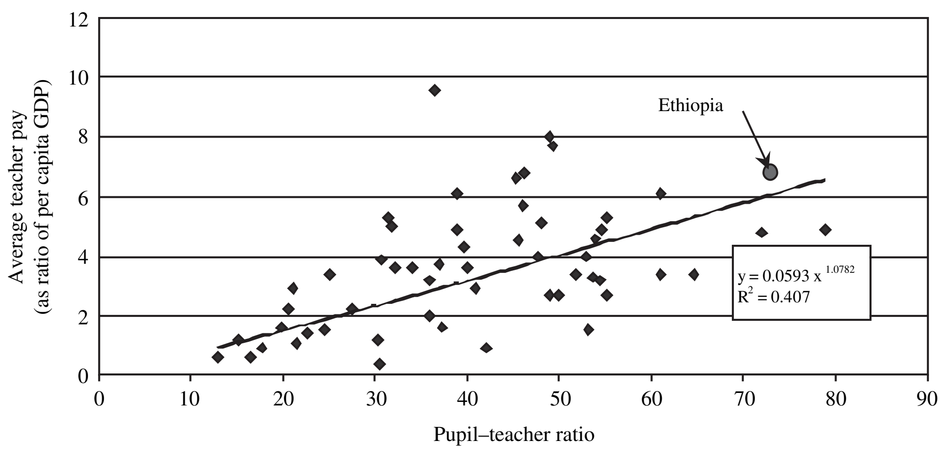
Table 3.21. Public Recurrent Spending Per Primary Pupil, Teacher Wages, Pupil-Teacher Ratios, and Spending on Inputs Other Than Teachers, Ethiopia and Selected World Regions, circa 2000

Country/region	Number of countries	Public spending per pupil[a]	Average teacher wage[a]	Pupil-Teacher ratio[b]	Percentage of recurrent spending on inputs other than teachers[c]
Ethiopia, 2001–02					
Grades 1–4	1	0.10	6.8	75.2	7.8
Grades 5–8	1	0.18	8.0	48.8	10.3
Regional averages, circa 2000					
Francophone Africa	20	0.13	4.4	51.0	26.8
Anglophone Africa	13	0.13	4.3	41.6	20.2
South & East Asia	10	0.09	2.4	36.5	23.4
Latin America	4	0.16	4.3	33.6	18.5
Eastern Europe & Central Asia	5	0.11	1.2	18.2	31.3

a. As a multiple of the per capita GDP.
b. Weighted average for government schools, excluding data for Somali, Benshangul-Gumuz, and Gambella for reasons indicated in text.
c. Includes spending on administrative personnel at the school level, pedagogical supplies, and unspecified nonsalary items for Ethiopia. Data exclude administrative spending at the federal and regional level.
Source: Ethiopia, Tables 3.6, 3.10, and 5.9; for country groups, Bruns, Mingat, and Rakotomalala (2003).

of spending on inputs other than teachers. In grades 5–8, Ethiopia's per pupil spending relative to the per capita GDP is comparable to the average for Latin American countries; but here again, the composition of spending reveals the same tradeoffs in which the higher cost of teachers is absorbed through a less favorable pupil-teacher ratio and fewer resources for nonsalary inputs. Even when compared with other African countries, where teacher remuneration as a multiple of the per capita GDP typically exceeds that in other low-income countries, the composition of spending in Ethiopia reflects a substantial tradeoff against student-teacher ratios and allocations for nonsalary inputs, in favor of higher teacher costs. The pattern in Figure 3.6 suggests that a fairly inevitable tradeoff exists between teacher remuneration and pupil-teacher ratios; the pattern is based on the experience of a large cross-section of countries around 2000.[66]

Figure 3.6. Relation between Teacher Remuneration and Pupil-Teacher ratio in Primary Education among Low-Income Countries, circa 2000



Note: Data for Ethiopia refer to grades 1–4.

Source: For Ethiopia, table 3.21; for all other countries, Bruns, Mingat, and Rakotomalala 2003.

Managing the Cost of Teachers. It is important to be clear about the options here. In theory, one can either reduce the pay rate or use teachers with lower levels of certification. In practice, these options must be assessed in light of prevailing labor market conditions as well as the objectives for the quality of the teaching staff and the broader goals for the quality of education. For teachers who graduated from a teacher training institute (TTI), the available data suggest that they earn a premium of between 10 to 60 percent relative to pri-

66. For a cross-country perspective on trends in teacher salaries across regions, see appendix Figure A3.1.

Table 3.22. Earnings of Teachers and Private Sector Workers by Level of Education, Ethiopia, 1997
(Birr per month)

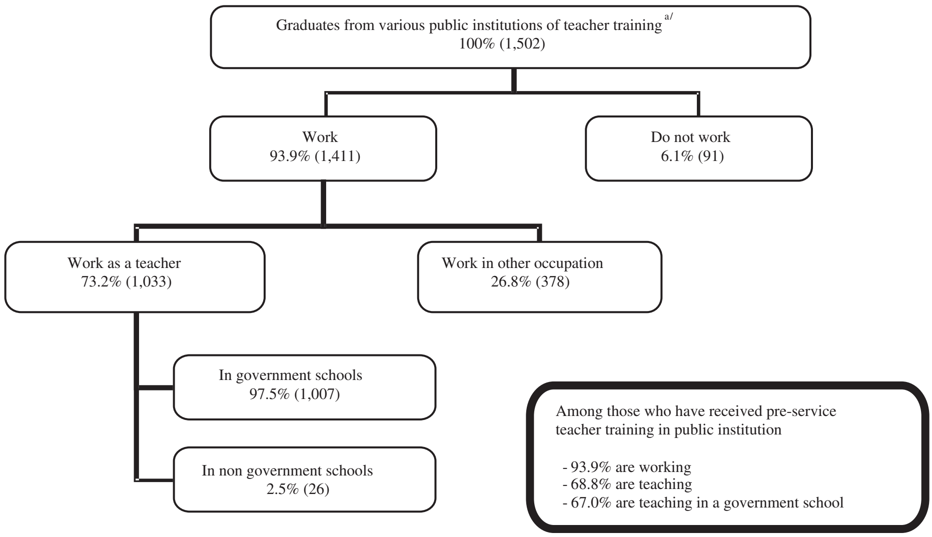
<table>
<tr><th rowspan="2">Item</th><th colspan="4">Level of educational attainment</th><th rowspan="2">Teacher salary as of a multiple private sector wage</th></tr>
<tr><th>Less than primary</th><th>Completed primary (8 years)</th><th>Completed secondary (12 years)</th><th>Completed higher education</th></tr>
<tr><td>Private sector workers[a/]</td><td>364</td><td>355</td><td>507</td><td>894</td><td></td></tr>
<tr><td>Government teachers in Oromiya[b/]</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Teacher training institute (TTI)</td><td></td><td colspan="2">551</td><td></td><td>1.1 to 1.6</td></tr>
<tr><td>Teacher training college (TTC)</td><td></td><td></td><td colspan="2">658</td><td>0.7 to 1.3</td></tr>
<tr><td>Bachelor’s or master’s degree</td><td></td><td></td><td></td><td>815</td><td>0.9</td></tr>
</table>

a. Data refer to monthly earnings in 1997 of private sector male workers ages 15–65.
b. Data refer to the average monthly take-home pay in 1997 of male teachers in Oromiya.; TTI-certified teachers straddle the primary and secondary education categories because their training lasts 10+1 years; likewise, TTC-certified teachers straddle the primary and higher education categories because their training lasts 10+3 years.
Sources: Private sector wages, Krishnan, Selassie, and Dercon 1998; Oromiya teachers’ pay, 2002 Oromiya teacher census.

vate sector workers (in all types of work) with the same level of educational attainment (Table 3.22). By contrast, the pay of teachers who graduated from teacher training colleges (TTCs) range from 0.7 to 1.3 times as high, while that of teachers with a university diploma or degree is only 0.9 times as high. These pay patterns are consistent with the observations reported in Poluha (2001) that practically all TTI graduates take up their posts and few of the teachers with this level of certification quit their jobs; by contrast, many teachers with TTC diplomas or university diplomas or degrees are leaving the profession for more attractive nonteaching jobs; among fresh graduates from teacher training courses, significant numbers do not even turn up at their posts, particularly in the more remote regions. Analysis of the 1997 Labor Force Survey shows a consistent result, in that a nonnegligible share, estimated at about 25 percent of the graduates of teacher training courses, seek employment outside the education sector (Figure 3.7).

It is not unusual for government wages to be more favorable than those in the private sector at the lower end of the educational ladder and less so at the higher end. However, this pattern of wage compression compounds the difficulty of managing the delivery costs of primary and secondary school services. To attract appropriately qualified teachers to the upper primary cycle and especially to secondary education, it may be necessary to provide selective premiums for teaching jobs at these levels. Clearly the wage premium would increase costs, making it all the more important to use teacher time efficiently. For TTI-certified teachers, the apparently straightforward option of cutting salaries is probably politically unviable, and may even undermine the education sector’s capacity to attract the best and brightest into the teaching profession. Countries that face similar problems have found the option

Figure 3.7. Where Graduates of Teacher Training Work after Their Preservice Training, Ethiopia, 1999



a. Includes college, universities, institutes, comprehensive schools, and other government institutions.

Source: Analysis of the 1999 Ethiopia Labor Force Survey.

of recruiting teachers at lower levels of certification to be more practical.[67] The result is to diversify the composition of teacher certification levels in grades 1–4. In such regions as Amhara, Oromiya, and Tigray, the recruitment of paraprofessional teachers has already begun to some extent. Such teachers may have completed tenth or twelfth grade without certification from a teacher training institute or college, and they typically receive substantially less pay than TTI- or TTC-certified recruits. Even so, recent processing of recruitment in, for example, Oromiya suggests that in some localities there may be as many as 20 applicants for each available position. Thus recruiting at lower levels of certification is not free of problems. In countries where the strategy has now created a large cadre of community teachers, pressures are mounting for the government to somehow formalize their employment status. Concerns exist that teachers with lower levels of certification may undermine educational quality (although preliminary evidence on student learning shows that there is no basis for this concern). In spite of these potential problems, this approach

67. In this regard, the experience of some Francophone African countries is instructive. Because of high teacher costs many of them have been unable to expand enrollments. That has changed recently, however, as these countries began to implement new policies to recruit contractual teachers, typically at half the pay of the regular teachers in the civil service. In Niger, for example, this policy has helped to lower the cost of teachers (while also reducing unemployment among those who leave secondary school), from an average of 9.7 times the per capita GDP in 1998, to an average of 5.9 times in 2002–03. Contractual teachers, who are paid about 3.5 times the per capita GDP, now make up more than half the teaching force. This policy has had a dramatic impact on enrollments: whereas the gross enrollment ratio stagnated at 30 percent for ten years prior to 1998, it had risen to 46 percent by 2002–03 (World Bank, 2004e).

may be the only way to achieve a balanced combination of school inputs within limited budgets in grades 1–4, one that is characterized not just by acceptable levels of teacher certification, but also by reasonable student-teacher ratios and adequate availability of books and other pedagogical materials.

Managing Teaching Loads in Primary and Secondary Education. Cross-country data on this aspect of service delivery—available mostly for middle- and high-income countries—are instructive (Table 3.23). In most countries, statutory teaching loads are comparably high across primary, lower secondary, and upper secondary education; by contrast, teaching

Table 3.23. Teacher's Weekly Teaching Hours by Level of Education, Ethiopia (2001–02) and Other Countries (1999)

Country	Primary	Lower secondary	Upper secondary
Ethiopia	**24.0**	**17.2**	**15.0**
OECD Mean[a/]	**21.2**	**19.4**	—
Minimum[b/]	15.2	15.0	—
Maximum[c/]	31.6	31.3	—
WEI Mean[d/]	**21.6**	**20.0**	**19.1**
Jordan	17.6	17.6	15.0
India	17.7	19.6	19.6
Malaysia	18.5	18.9	18.9
Thailand	19.0	16.3	16.3
Russian Federation	19.1	17.2	17.2
Uruguay	19.3	12.9	12.9
Brazil	20.0	20.0	20.0
Argentina	20.1	21.8	19.9
Paraguay	20.6	21.6	24.3
Egypt	20.8	20.8	20.8
Chile	21.5	21.5	21.5
Peru	21.8	17.4	17.4
Tunisia	22.1	17.0	18.1
Jamaica	25.0	25.0	17.0
Zimbabwe	25.0	24.0	24.0
Indonesia	28.6	16.8	16.8
Philippines	29.4	29.4	24.5

—Data not available.

Note: OECD Organization for Economic Cooperation and Development; WEI World Education Indicators.

a. Data are for 27 countries.

b. Data are for Denmark (primary education) and Hungary (lower secondary education).

c. Data are for the United States of America.

d. Data are for the 17 countries listed above participating in the OECD project on World Education Indicators (WEI) in which data on a range of topics in education are collected using common instruments and methodology.

Source: Ethiopia, Table 3.13; other countries, UNESCO-UIS/OECD 2002.

loads in Ethiopia generally fall as the level of schooling rises; Tigray alone among the regions bucks this pattern, conforming instead to the flat pattern common in the more developed countries.[68] These comparisons suggest that teacher time utilization in Ethiopia can probably be enhanced, particularly beyond the first cycle of primary schooling. In some regions, there is probably room for improvement even in the first cycle of primary schooling. The use of curricula that require specialized teaching is undoubtedly part of the explanation why teaching loads are not as full as they could be, but other constraints, for example, the lack of sufficient classrooms, may also pertain. While the present study does not mean to examine the precise importance of these constraints, a better understanding of their impact as well as potential approaches for overcoming them, will clearly be needed to develop a sound policy for better management. Such a policy will be indispensable for large-scale expansion of the system in a financially viable manner.

Designing a Fiscally-sustainable Long-term Strategy for Sector Development. Such a strategy is, by definition, one that entails spending levels that fit within the sector's likely resource envelope. Designing a strategy involves managing policy choices in two broad areas. First are the quantitative targets for coverage by the various levels and types of education services. The second area comprises the arrangements for service delivery that affect costs, including such aspects as the division between government and nongovernment finance and delivery, the extent of provision through low-cost alternatives to regular government schools (for example, alternative basic education at the primary level), the mix of inputs in government schools (as implied by such parameters as teacher certification levels, pupil-teacher ratios, teaching loads, level of spending on nonsalary inputs, and so on), and the extent to which students contribute to the cost of their education. Since resources are limited, tradeoffs in both broad policy domains are inevitable and can occur in one of two ways: by default in the absence of explicit choices, or by strategic design to achieve a balanced progression toward the country's educational goals. Because the former route typically yields results that hurt the poor disproportionately, the second approach is more consistent with the government's overall commitment to poverty reduction.

Investments in education involve multiyear commitments whose fiscal impacts are fully felt only after a lag. Thus, a long-term perspective is important when evaluating the tradeoffs needed to manage the fiscal sustainability of alternative policy options. This perspective can be generated using a simple budgeting model to project costs over a sufficiently long horizon, say to 2015 (which coincides with the target date for achieving the United Nations Millennium Development Goals). One such model prepared jointly by a World Bank team and counterparts from the Ministry of Education (2004) shows that in 2015 the country would have to incur annual recurrent costs amounting to 3.9 percent of GDP (compared with 1.4 percent in 2001–02) to achieve eight years of universal primary school completion under the following assumptions that capture some of the government's policies:

a. Unchanged levels of teacher remuneration from those in 2001–02—TTI-certified teachers receiving 6.8 times the per capita GDP annually; TTC-certified teachers

68. Because actual teaching loads may be smaller than statutory teaching loads, the comparison between Ethiopia and the other countries in the Table 3.22 should obviously not be pressed too far.

receiving 10.6 times; teachers in the second cycle with less than a diploma receiving 7.2 times; and uncertified teachers in the first cycle receiving 4.8 times;

b. An increase in the annual output of teachers from preservice training institutions—from 6,000 currently from teacher training institutes (TTIs) and 1,200 from teacher training colleges (TTCs), respectively, in 2001–02 to 15,000 and 5,000, respectively, by 2015;

c. A slight rise in the average teaching load of teachers from 17 hours per week to 20 hours in the second cycle to reflect more efficient time use while still allowing for specialized teaching in this cycle;

d. A decline in the current number of pupils per section from 77 and 68 in the first and second cycles, respectively, to an average of 60 in both cycles;

e. An increase to 20 percent in the share of recurrent expenditures at the school level dedicated to nonteacher pedagogical and other inputs, from the present levels of 7 and 10 percent, respectively, in first and second cycles.[69]

At 3.9 percent of GDP, the projected recurrent cost requirements for primary education are extremely high and probably unsustainable, particularly because the country would then be exposed to the risk of relying on external funds to cover as much as a third of the cost of salaries. Indeed, in low-income countries that are close to achieving universal primary school completion, government spending on primary education typically hovers around 2 percent of GDP. For Ethiopia to manage spending on primary education within this ceiling would require a combination of choices that involves: (a) setting a more modest goal for coverage, such as universalizing five or six years (rather than eight years of primary schooling by 2015 as in most low-income countries; (b) relying on low-cost alternative basic education to cater to a substantial share of children; and (c) reducing the target production of TTI-certified teachers. Depending on the specific choices made in these domains, it may be possible to free up sufficient resources to lower the average pupil-teacher ratio and section size to more manageable levels than at present. Under some policy combinations, the share of teacher salaries potentially exposed to the risk of dependence on external finance can be kept to an arguably manageable level of less than 20 percent.

In postprimary education, recurrent costs in 2015 could reach 3.3 percent of GDP (compared with 1.4 percent of GDP in 2001–02) under the following assumptions, many of which correspond to what may appear to be reasonable goals and policies:

In secondary education

a. A rise in the gross enrollment rate in grades 9–10 from 16 percent at present to 25 percent by 2015; and maintenance of the ratio in grades 11–12 at its current level of 8 percent;

b. An increase in the share of secondary students enrolled in nongovernment schools from 2 percent at present to 10 percent by 2015;

69. Administrative overheads for system administration at the national, regional, and *woreda* levels are projected separately and are assumed to be capped at 10 percent of total recurrent spending for all levels, slightly lower than the share of 11 percent at present.

c. A decrease in the number of students per section in government schools from 85 in grades 9–10 and 78 grades 11–12 at present, to 60 per section in both cycles by 2015;
d. A rise in the average teaching load, from 16 hours weekly at present among teachers in grades 9–10, to 20 hours by 2015; and from 13 hours among teachers in grades 11–12, to 16 hours; and
e. An increase to 50 percent in the share of recurrent expenditures at the school level dedicated to nonsalary recurrent inputs, from 27 percent at present in grades 9–10, and 35 percent in grades 11–12;

In technical and vocational education and training (TVET)

f. A rise in the number of students in regular public institutions from 36,500 in 2001–02, to 200,000 by 2015;
g. A continuation of recurrent spending per student unchanged at the current level of 2.8 times the per capita GDP; and

In higher education

h. An increase in the number of students in regular government institutions from 28,000 in 2001–02 to 120,000 by 2015; and
i. A continuation of recurrent spending per student at the current level of 10.8 times the per capita GDP.[70]

The projected annual recurrent spending of 3.3 percent of GDP in 2015 for postprimary education is more than twice what the government currently spends on the whole education sector. Taking into account the requirements for primary education, the shortfall in financing for postbasic education may reach as high as US$338 million annually in 2015. The gap is very large and probably impossible to bridge because donors have not made the same commitment to help defray recurrent costs as they did to finance the recurrent costs to universalize primary education under the United Nations Declaration on the Millennium Development Goals. While the government may raise its domestic spending on education to narrow the gap, erasing it completely might also require combining policies to slow the expansion of enrollments, reduce spending per student in government institutions through efficiency measures, or increase cost sharing with students. One simulation, for example, shows that fiscal balance can be achieved by raising domestic spending on education to 3.9 percent of the GDP by 2015 while at the same time capping the enrollment targets in that year at 140,000 for government TVET and 80,000 in public higher education, lowering per student spending to two times the per capita GDP for TVET and to seven times for higher education, and raising the teaching load in grades 11–12 to 20 hours a week. The issues that policymakers would have to grapple with are: (a) whether or not a claim of 3.9 percent of GDP in domestically generated resources for education is feasible in light of other government priorities; and (b) whether or not the reduced targets for enrollments and the measures for cost management cohere with the strategy for sector development.

It cannot be emphasized enough that the foregoing results, like those from any simulation exercise, are meant only to illustrate an approach for informing policy assessment and design. Clearly, “getting the numbers right” is only a first step in an inherently iterative process; indeed, it is no more than a mechanical complement to a careful assessment of

70. The model includes nonformal adult education, special needs programs, and distance education. Spending on these activities is projected to rise from the amount spent in the base year—1.5 times the GDP growth rate—to reflect a reasonable rate of expansion from the tiny amount in the base year.

the practical and political feasibility of the choices being considered. The Government of Ethiopia may have a strong political preference for universalizing the entire eight years of primary education, as well as dramatically increasing the numbers of students at the TVET and higher levels. These aspirations would definitely play a central role in setting policy direction. The virtue of quantifying their fiscal implications using a sector-wide simulation model is to help articulate the priorities among them, and to clarify the nature of the tradeoffs—between education and other sectors, across subsectors within education, and across input options within each subsector—that would be required for fiscal sustainability. By considering the whole sector in one setting rather than each subsector separately, this approach helps to minimize the risk of unbalanced progress in education. Finally, it is important to caution that the numbers plugged into any simulation model are just numbers in the absence of action plans to translate them into reality. For example, if increasing average teaching loads to 20 hours a week is part of the policy package that is deemed to be the most fiscally viable, the policymaker must then devise an action plan to bring the system toward this target load, including addressing possible opposition to the change, introducing the necessary adjustment in the curriculum, and altering teacher training and development programs to broaden teachers' competency across subjects.

Conclusion

The education system in Ethiopia is expanding rapidly. Scaling up from what has been a sparse network of schools serving the country's elites to one that will cater to the entire population of primary school-age children presents enormous financial challenges. Public spending on education will probably need to rise beyond its present level, but this alone is unlikely to bring about a successful expansion. Efforts to mobilize additional funding for education through the development of privately financed education will be important, particularly at the postprimary levels, not least because the extra resources can help facilitate the prioritization of primary education in the allocation of public spending on education. Throughout the system, the pattern of spending per student warrants close tracking to ensure that resources are used as efficiently as possible. In the context of education decentralization, it is especially important to minimize the tendency toward increased spending on administrative overheads. In primary and secondary education—levels that absorb a combined share of nearly two-thirds of all public spending on education—efficient resource use is critically important to the financial viability of large-scale expansion of the system. In this regard, the allocation of spending across the mix of school inputs, as well as the management of teacher costs and workloads, appear to be among the most urgent issues on the agenda for policy development. Finally, because the country's aspirations for educational development inevitably involve multiple objectives and because the means to achieve them are so varied, it would be wise to evaluate the combined implications of subsector policy choices, particularly with regard to their long-term fiscal viability. Especially in a resource-strapped country like Ethiopia, such an evaluation can help policymakers avoid tacit tradeoffs that all too often hamper progress in education that is both steady and beneficial to the poor.

CHAPTER 4

Disparities in Enrollments, Student Flow, and Benefit Incidence

Chapters 2 and 3 documented the performance of Ethiopia's education system in aggregate terms without distinguishing outcomes across population groups. The purpose of this chapter is to bring out some of these differences, particularly across regions and between girls and boys, rural and urban residents, and children from poor and rich families. The patterns of educational access and student flow and the incidence of public spending on education suggest that the disparities across social groups in Ethiopia are globally comparable with the average pattern in low-income countries. Predictably, Ethiopian girls are less likely than boys to attend school at all levels and the gap widens with level of schooling; children from rural areas and those from poor families lag behind their peers in urban areas and those from wealthier families. The gap between rural and urban children is exceptionally large in Ethiopia, however. This counteracts the country's better-than-average standing versus other countries regarding differences across income groups, and a relatively modest shortfall in the gap between boys and girls. In Ethiopia, the average rural child of primary school age is only one-third as likely as his or her urban counterpart to have access to primary schooling, compared with the corresponding average of nearly two-thirds in other low-income countries. Clearly this is an area where progress can and should be made if the country is to advance toward the Millennium Development Goal that by 2015 all Ethiopian children have the opportunity to complete at least five years of primary schooling of reasonable quality. Addressing this structural weakness in the system is essential as a long-term strategy for narrowing the current socioeconomic gaps in postprimary education. It will not only call for interventions to increase the supply and quality of primary schools in rural areas, but also require targeted measures to relieve demand-side constraints among vulnerable population groups, including orphans and children from the poorest families.

Overview of Participation Rates

We begin with an overview based on gross enrollment ratios. A later section will provide a more detailed evaluation based on student flow indicators.

Gross Enrollment Ratios Across Regions. The relevant data appear in Table 4.1 and show the changes in this indicator for primary and secondary education between 1993–94 and 2001–02, for the country as a whole and across regions. Globally, the primary gross enrollment ratio (GER) rose by more than 2.5 times during this period, while the secondary GER grew by 1.9 times. In primary education, the gains by this measure were largest in Amhara, but because of its relatively modest base in 1993–94, the region's GER in 2001–02 remained slightly below the national average. In 2001–02, Afar and Somali still had the lowest GERs—only around 13 percent—despite both regions' rapid expansion since 1993–94.

In secondary education, the leading regions in 1993–94, Addis Ababa, Harari, and Dire Dawa, continued to rank at the top in 2001–02 even though their GERs rose more slowly than in the country as a whole—1.4 and 1.6 times, respectively, during the period, compared with a 1.9 fold increase nationwide. Tigray appears to have made very large gains, boosting its GER from 4.4 percent to nearly 25 percent during the period; it is now in the ranks of the leading regions for secondary school coverage. For other large regions—Oromiya, Amhara, and SNNPR—the GER is comparable among them, around 10 percent. Consistent with their modest coverage at the primary level, Afar's and Somali's secondary GERs, 3.2 and 1.4 percent, respectively, in 2001–02, are the lowest in the country.

Table 4.1. Gross Enrollment Ratios by Region, Ethiopia, 1993–94 and 2001–02

	Primary education (grades 1–8)			Secondary education (grades 9–12)		
Country/region	**1993–94**	**2001–02**	**Index (1993–94=1.0)**	**1993–94**	**2001–02**	**Index (1993–94=1.0)**
Ethiopia	**24.1**	**61.6**	**2.56**	**6.9**	**13.1**	**1.90**
By region						
Tigray	43.7	77.6	1.78	4.4	24.8	5.64
Afar	5.0	12.6	2.52	1.2	3.2	2.67
Amhara	17.9	58.1	3.25	5.2	9.1	1.75
Oromiya	21.2	62.4	2.94	5.6	11.6	2.07
Somali	6.5	13.1	2.02	0.4	1.4	3.50
Benshangul	35.4	89.1	2.52	2.4	12.2	5.08
SNNPR	28.8	67.5	2.34	5.1	10.7	2.10
Gambella	53.9	102.7	1.91	5.3	12.4	2.34
Harari	53.4	107.5	2.01	31.6	50.3	1.59
Addis Ababa	84.9	128.4	1.51	40.8	57.3	1.40
Dire Dawa	41.0	80.2	1.96	19.4	28.4	1.46

SNNPR Southern Nations and Nationalities Peoples Republic.
Source: Data supplied by the Education Management Information System (EMIS) Panel of the Ministry of Education.

Enrollment Ratios Across Gender and Socioeconomic Groups and Locality. Distinctions between boys and girls and between urban and rural areas are a standard feature in any discussion of social differences in education. In the context of poverty-reduction strategies, it is also becoming routine to examine the gaps in schooling between children from rich and poor families, particularly as survey data have become increasingly available to document these disparities. In the material below, we shall rely on the latest survey data for Ethiopia available at the time of data analysis for this report—the 2000 Welfare Monitoring Survey/Household Income and Consumption Expenditure Survey.[71] To maintain consistency, we use this source to compare the three sets of population groups of interest here (even though school census data and population projections can also yield estimates by gender and urban-rural residence).[72]

A simple way to gauge the biases in educational coverage is to express the gross enrollment ratio of the lagging group relative to that of the more favored group (Table 4.2). For example, this calculation yields a gender index of 0.82 for primary education as a whole, implying that primary school coverage for girls is only about 80 percent as high as that for boys. Taking the pattern of indices as a whole, we see that two conclusions can be distilled from the table. The first is that in each set of comparison, the lagging group invariably loses more and more ground as the level of education rises. By the time rural youths compete for places in secondary school, the loss is practically complete relative to their urban counterparts.[73] The widening gap as students climb the educational ladder arises for many reasons. One is a poor start the lagging groups experience in primary schooling, which is then exacerbated by such factors as the practice of early marriage among Ethiopian women, families' reluctance to invest in girls' education, and, quite important, girls' generally weaker learning outcomes, including performance on national examinations for entry to secondary higher education.[74] The second conclusion from the data is that the gaps between girls and boys, and

71. In additional to information on place of residence and each child's sex and schooling status, the survey also contains information on household consumption expenditure (for food and nonfood items), making it possible to associate schooling status with household wealth (the wealthier being those who can afford a higher level of consumption). The wealth ranking here is meant only for comparisons across households in Ethiopia. Since Ethiopia remains a poor country as a whole, it is possible that even the richest in the land may be poor by the standards of other countries.

72. As indicated in Chapter 2, gross enrollment ratios are computed from census data by dividing the counts of students enumerated in the annual school census by projected populations (unless in a general population census year) in the relevant age group or from survey data. In primary and higher education, there is reasonably close agreement between the overall estimates from the census-based data and data from surveys; in secondary education, however, definitional and other problems appear to have created significant differences in the estimates across sources, including rates computed from different surveys conducted around the same time. For this reason, only the ratios by wealth group for secondary enrollment in Table 4.2 are based on survey data, as this is the only source for this disaggregation. It is noteworthy that while the *absolute level* of survey-based GER estimates differs from those based on census data, the *relative rates*—between boys and girls, and between urban and rural children—remain comparable across data sources. This pattern gives some basis for the view that the survey data give a reasonable portrayal of the relative rates between children from rich and poor households in the access to secondary education.

73. In many Sub-Saharan African countries, including Ethiopia, rural children are sent to urban areas to stay with their kin for their secondary education. This does not eliminate the disparity but it does mitigate the magnitude.

74. In the national examinations administered in 2001–02, for example, pass rates among girls on the grade 12 national examination were only 63 percent as high as among boys. In Oromiya, where data are available for the results of the 2001–02 regional grade 8 examinations for a sample of some 31,000 candidates, the pass rate among girls was 86 percent as high as among boys. See also Chapter 5 for additional information on learning outcomes.

Table 4.2. Gross Enrollment Ratios by Locality, Gender, and Wealth, Ethiopia, 1999–2000

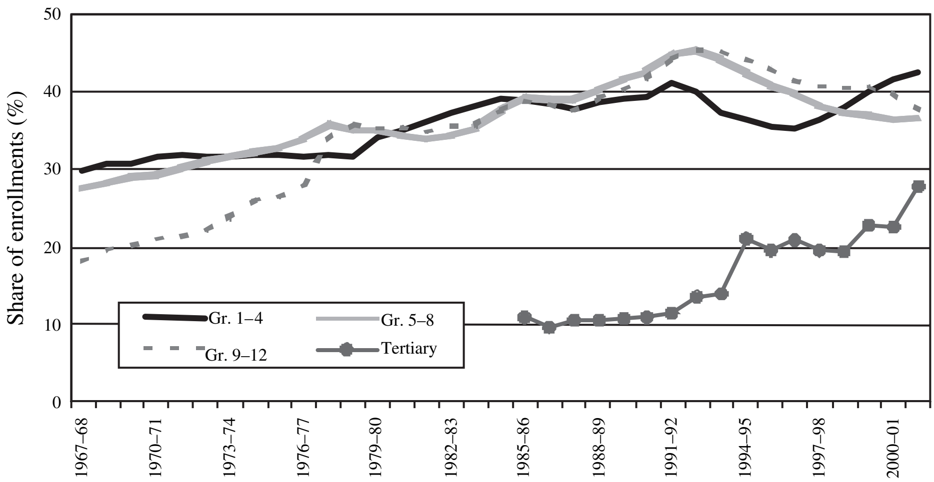
Population group	Primary education: Grades 1–4	Grades 5–8	Grades 1–8	Secondary education (grades 9–12)[a/]	Higher education[b/]
By gender					
Boys	89.1	53.6	72.6	*15.6*	2.6
Girls	72.6	43.8	59.3	*10.5*	0.6
Index (boys = 1.0)[c/]	**0.81**	**0.82**	**0.82**	***0.67***	**0.21**
By locality					
Urban	122.9	101.1	111.6	*76.3*	3.7
Rural	65.3	22.0	46.2	*0.4*	0.02
Index (urban = 1.0)[c/]	**0.53**	**0.22**	**0.41**	***0.00***	**0.00**
By consumption quintile[d/]					
Richest	112.3	81.2	95.8	53.7	4.8
2	91.0	68.8	80.6	31.1	1.0
3	89.5	50.9	71.3	26.6	1.0
4	80.0	45.0	64.3	21.6	0.4
Poorest	72.9	42.2	59.4	18.9	0.3
Index (richest 20% = 1.0)[c/]	**0.65**	**0.52**	**0.62**	**0.35**	**0.05**

a. Ratios in the first two blocks are shown in italics to alert the reader that for reasons explained in footnote 2 of this chapter, the data are based on data from the school census and population projections rather than on data from the survey.
b. The denominator for this calculation is the population ages 19–23.
c. The index is computed by dividing the ratio for the less-favored group in each block (i.e., girls, rural children, and children from the poorest quintile), by the corresponding ratio for the more-favored group (i.e., boys, urban residents, and children from the richest quintile).
d. Households are ranked according to the per adult equivalent expenditure on food and other nonfood items.
Source: Analysis of the 1999–2000 Ethiopia Welfare Monitoring Survey and 1999–2000 Ethiopia Household Income and Consumption Expenditure Survey; for secondary ratios by gender and locality, data supplied by the Education Management Information System (EMIS) Panel of the Ministry of Education.

between children from rich and poor families, are not nearly as large as the gaps between urban and rural children. This source of social disparity tends to be lost amid the well-justified concern about gaps between girls and boys.

Nonetheless, it is important to acknowledge that the relatively favorable position of girls today is the culmination of progress over a long period, as Figure 4.1 demonstrates. In 1967–68, for example, girls accounted for just 30 percent of the pupils in grades 1–4; their share took about 25 years to reach 40 percent. Notice that the share of girls actually dipped to about 35 percent during the rapid phase of expansion of schooling opportunities in the early to mid-1990s, which suggests that during this period, boys were benefiting proportionately more than girls. In 1967–68, the share of girls in grades 5–8 was also about 30 percent, but it surpassed 40 percent earlier—around 1988–89—and grew to about 45 percent in 1993–94; from then through the present, it fell below 40 percent because boys started

Figure 4.1. Female Share of Total Enrollments by Level, Ethiopia, 1967–68 to 2001–02



Source: Times series data supplied by the Education Management Information System (EMIS) Panel of the Ministry of Education.

crowding into the system. At the postprimary levels, the progress of girls has generally been faster than at the primary levels, which is not surprising given the modest initial position—girls represented less than 20 percent of enrollments in grades 9–12 in 1967–68, and about 10 percent of those in higher education in 1985–86, the earliest year for which the relevant data are available.

Socioeconomic gaps in coverage across regions are also interesting, but data constraints limit our observations here to the differences between boys and girls. Using the share of girls in school as a measure for our comparison, we can see from Table 4.3 that although gender gaps exist in all regions, no region strays especially far from the national average, and this pattern is true for both primary and secondary education. Addis Ababa is an exception in that it is the only region where girls' share of enrollments exceeds that of boys in both the primary and secondary cycles. Consistent with the findings presented above, the share of girls generally declines between primary and secondary education, but the decline is uneven across regions; Tigray, Somali, and Gambella show the largest absolute loss of between 9 and 12 percentage points. In Afar and Harari, the girls' share actually posted a modest gain between these cycles.

School Participation Among Orphans. Because of the relatively high prevalence of orphanhood among school-age children in Ethiopia, it is of interest to document their pattern of school participation relative to other children. The available data, shown in Table 4.4, pertain to primary schooling.[75] A somewhat surprising fact is that they show that participation

75. Participation rates for secondary and higher education are not computed because the sample refers to children ages 0–15.

Table 4.3. Female Share of Primary and Secondary Enrollments across Regions, Ethiopia, 2001–02

	Percent female		Index (Ethiopia=1.0)	
Country/region	**Grades 1–8**	**Grades 9–12**	**Grades 1–8**	**Grades 9–12**
Ethiopia	**40.9**	**39.3**	**1.00**	**1.00**
By Region				
Tigray	48.2	36.8	1.18	0.94
Afar	36.9	39.3	0.90	1.00
Amhara	45.8	42.1	1.12	1.07
Oromiya	36.9	35.6	0.90	0.91
Somali	32.8	23.6	0.80	0.60
Benshangul-Gumuz	36.3	30.8	0.89	0.78
SNNPR	37.4	31.7	0.91	0.81
Gambella	36.3	23.7	0.89	0.60
Harari	41.0	42.7	1.00	1.09
Addis Ababa	52.7	50.2	1.29	1.28
Dire Dawa	43.5	43.1	1.06	1.10

SNNPR Southern Nations and Nationalities Peoples Republic.
Note: Includes enrollments in evening programs.
Source: Based on data on enrollments supplied by the Education Management Information System (EMIS) Panel of the Ministry of Education.

Table 4.4. Percentage of Children Ages 7–14 Currently Enrolled in Primary School by Orphanhood Status, Ethiopia, 1999–2000

Status of child[a/]	**Boys**	**Girls**	**Both sexes**
Both parents alive	**51.0**	**42.4**	**46.8**
Living with both parents	49.8	39.6	44.9
Living with only one parent or neither	55.5	51.0	53.1
At least one parent dead	**50.1**	**43.4**	**46.8**
Mother dead; father alive	48.2	37.0	42.8
Father dead; mother alive	50.9	45.3	48.1
Both parents dead	49.7	46.3	48.0
All sample children	**50.9**	**42.6**	**46.8**
Children not living with biological parents	**49.2**	**46.2**	**47.6**
Memorandum:			
Sample size	42,640	41,491	84,131

a. The distribution of children according to orphanhood status is as follows: 68,792 have both parents; 15,339 have lost at least one parent (of whom 3,765 have lost their mothers, 10,235 have lost their fathers, and 1,339 have lost both parents), and 11,046 live with someone other than their biological parents.
Source: Analysis of the 1999 Ethiopia Labor Force Survey.

rates among orphans ages 7–14 are, on average, comparable to those of other children, which suggests that safety nets are probably in place, perhaps informal in nature, and appear to be working. Nonetheless, participation rates lag among maternal orphans (children who have lost their mothers), especially girls among them. The disadvantage faced by maternal orphans is consistent with findings in other countries, demonstrating the important role of mothers in enrolling their children in school; the disadvantage faced by girls among them is consistent with the likelihood that they rather than their brothers would assume the role of family caregivers in the absence of a mother in the family. It is important to emphasize that while the overall gaps between orphans and nonorphans are relatively small at present, they may widen as coverage of the system expands, because orphans face more than the usual obstacles to schooling and may not be able to take advantage of the expanding opportunities in the absence of specific efforts to address their needs. It is therefore appropriate to keep a close watch on the educational progress of this obviously vulnerable group of children.

Disparities in Student Flow Patterns in Primary Education

Information on student flow patterns can enrich the foregoing comparisons based on gross enrollment ratios. Below we present data on the disparities in the rates of entry, survival, and completion across the three sets of population groups considered earlier—boys versus girls, children residing in urban areas versus their rural counterparts, and children from rich versus those from poor families. We shall focus on primary education, in part because of data constraints, but, more important, because disparities at this level are a valuable source of the biases that develop at the postprimary levels.

Pattern Across Socioeconomic Groups and Urban-Rural Locality. Table 4.5. displays the relevant data based on estimation methods explained in Chapter 2. In other words, they pertain to the schooling career of a composite cohort of children passing through their schooling years, as implied by currently observed rates of entry and transition between adjacent grades. The second column in the table refers to the percentage of children who will ever enroll in grade 1; the third and fourth columns, to the percentage of first-graders who survive to grades 4 and 8, respectively; the fifth and sixth columns, to the completion rates in grades 4 and 8 (obtained as the product of the entry and respective survival rates in the previous columns). Finally, to complete the picture, the last column of the table shows the percentage of pupils in the entire primary cycle who are repeaters.

Consider first the disparities in student flow between boys and girls. Girls are 75 percent as likely as boys to enter first grade, but once in school, they more or less match boys in persisting to each stage in the two subcycles of primary schooling. These patterns combine to produce completion rates for girls that are 72 percent as high as boys in grade 4, and 75 percent as high in grade 8. The prevalence of repetition among girls is comparable, albeit somewhat elevated, to that among boys. The implication of these findings is that the lagging participation of girls in primary education, as documented earlier by the gaps in the gross enrollment ratios, can be attributed almost entirely to their lower rates of participation at entry.

The comparison between urban and rural children is more complex. The table shows that not only are rural children only half as likely as their urban peers to enroll in grade 1, they are also less likely to reach subsequent grades—they are only 72 percent as likely to

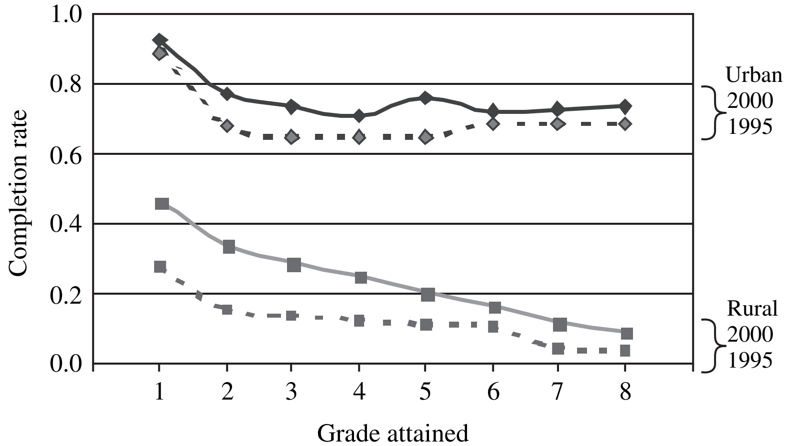
Table 4.5. Student Flow Indicators in Primary Education by Gender, Locality, and Wealth Groups, Ethiopia, circa 2000

Population group	Percentage of cohort ever enrolled in grade 1[a/]	Composite cohor survival rate from grade 1 (%)[b/]		Repeaters as completion rate (%)[c/]		Percentage of enrollments (grades 1–8)[d/]
		To grade 4	To grade 8	Grade 4	Grade 8	
Ethiopia	52.4	60.0	36.0	31.4	18.9	15.9
By gender						
Boys	59.8	61.0	35.8	36.5	21.4	13.8
Girls	44.8	58.7	35.8	26.3	16.0	14.6
Index (boys=1.0)	**0.75**	**0.96**	**1.00**	**0.72**	**0.75**	**1.06**
By locality						
Urban	90.0	76.9	79.8	69.2	71.8	13.6
Rural	45.3	55.3	19.7	25.0	8.9	14.4
Index (urban=1.0)	**0.50**	**0.72**	**0.25**	**0.36**	**0.12**	**1.06**
By consumption quintile						
Richest	76.1	—	—	*89.1*	*54.7*	10.3
Poorest	54.0	—	—	*57.6*	*22.7*	13.5
Index (richest=1.0)	**0.71**	—	—	***0.65***	***0.42***	**1.31**

— Because of data constraints, composite cohort survival could not be computed by quintile group.
a. Refers to the percentage of children who have ever enrolled in grade 1 by ages 13–14; see also footnotes in Table 2.4.
b. See Chapter 2 for explanation of estimation method.
c. Composite cohort completion rates are computed by multiplying the cohort entry rate to grade 1 by the relevant composite cohort survival rates. Because of data constraints, the composite cohort survival rate by income group could not be computed using the same method. Shown here in italics are the cross-sectional completion rates (see Chapter 2 for an explanation of the estimation method).
d. Repeaters defined to include readmitted pupils.
Source: Percent ever enrolled in grade 1 based on analysis of the 2000 Welfare Monitoring Survey and the 2000 Household Income and Consumption Expenditure Survey; remaining columns based on data supplied by the Ministry of Education on enrollments and repeaters (including readmitted pupils) by grade for two school years, 2000–01 and 2001–02.

survive to grade 4 and only 25 percent, to grade 8. In light of these compromises in student flow, it is no wonder that grade 4 completion rates among rural children are, on average, only 35 percent as high as those of urban children, and grade 8 completion rates a mere 13 percent as high. Noteworthy is the fact that these statistics imply that the lower completion rates at both points are attributable more to the lower entry rates to grade 1 among rural children than to their lower survival rates to subsequent grades. It is now also clear that the very small rural representation among eighth-graders explains why, as documented earlier by the analysis of gross enrollment ratios, there are so few rural youths among secondary and higher education students. A corollary of this finding is that if the participation of rural children in postprimary education is to improve, there is no alternative but to begin by rectifying the shortfalls in primary education in rural areas. Figure 4.2 brings out the urban-rural differences and provides a vivid summary of the challenges to raising completion rates in these localities.

Figure 4.2. Cohort Entry Rate to Grade 1 and Completion Rates in Grades 4 and 8 across Regions, Ethiopia, circa 2000



Note: The entry rate to grade 1 refers to the percentage ever enrolled; the completion rate at subsequent grades refers to the product of the entry rate and the relevant survival rate.

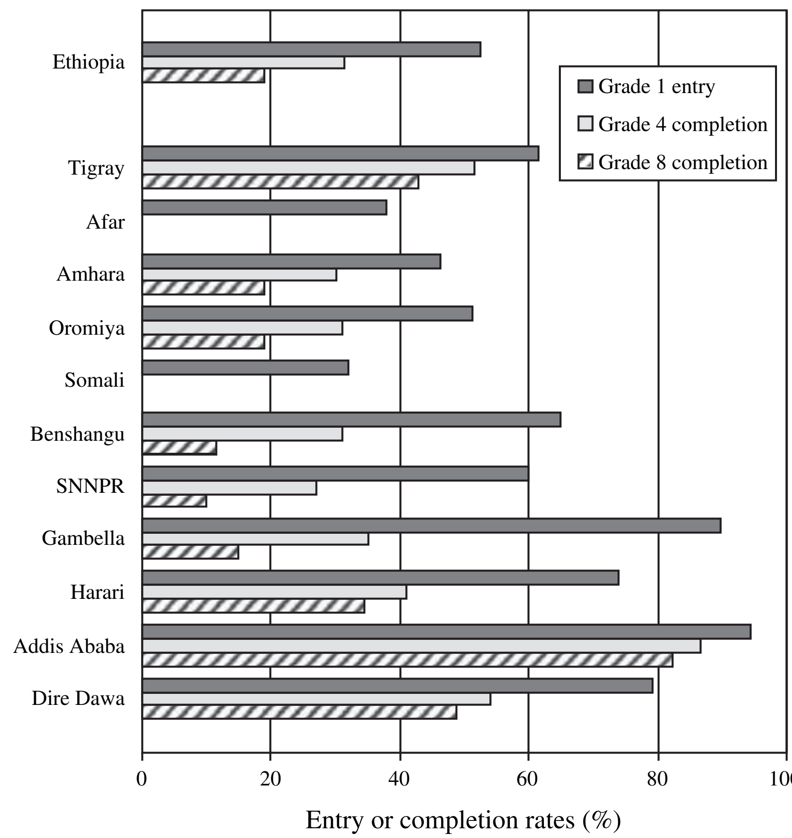
Source: Ever-entered rates based on analysis of the 1995 and 2000 Welfare Monitoring Surveys; survival to subsequent rates based on school census data for 1994–95, 1995–96, 1999–2000 and 2001–02.

Finally, the tables above also document the student flow patterns across wealth groups. Data constraints limit our calculations to an estimation of cohort entry rates to grade 1, and cross-sectional completion rates in grades 4 and 8. Children from the poorest quintile of Ethiopian households are only 71 percent as likely to enter grade 1 as children from the wealthiest quintile; their completion rates are only 65 percent as high in grade 4, and 42 percent as high in grade 8. These patterns imply that the gap in survival rates between the two groups is probably modest in the first years of primary schooling, but widens appreciably in the later grades. With regard to grade repetition, it is interesting to note that the discrepancies between the two groups are relatively large, unlike the results for the comparisons by gender and urban-rural locality.

Taken as a whole, the foregoing results confirm two important patterns. First, the gaps in educational participation widen with rising levels of education; and second, among the three sets of socioeconomic comparisons, the disparity in schooling is much wider between children in urban and rural areas, than between boys and girls, or even between rich and poor. The results also help to locate entry to grade 1 as the point at which most socioeconomic disparities in school participation are introduced. This shortfall explains completely the relative gap between boys' and girls' participation in primary education. For the other comparisons, gaps in entry to grade 1 remain the main cause of underrepresentation of rural children and those from the poorest families, even though the inability to sustain participation beyond grade 4, particularly among rural children, further reinforces the gaps already introduced at the start.

Regional Differences in Student Flow. The relevant data are displayed in Figure 4.3 (for the sake of simplicity, only the entry rate to grade 1 and the completion rates at grades 4 and 8 are shown). Substantial regional differences characterize all three indicators of student flow. Addis Ababa is the best-performing region—entry rates of nearly 95 percent, and completion rates of 92 percent in grade 4 and 87 percent in grade 8; this implies that, once enrolled, a large share of the pupils eventually reaches the end of the eight-year cycle. The four large regions—Tigray, Amhara, Oromiya, and SNNPR—lag behind Addis Ababa in all aspects of student flow. But the shortfall is smallest in Tigray, which has a grade 1 entry rate of 61 percent, survival rates of 84 percent to grade 4, and 70 percent to grade 8. In SNNPR, the entry rate to grade 1 is a respectable 60 percent, but because of high dropout rates in the early grades of primary schooling, the grade 4 completion rate is only 27, and the rate in grade 8, only 10 percent. Oromiya and Amhara fare worse than SNNPR by having lower

Figure 4.3. Cohort Entry Rate to Grade 1 and Completion Rates in Grades 4 and 8 across Regions, Ethiopia, circa 2000



Benshangul, Benshangul-Gumuz.

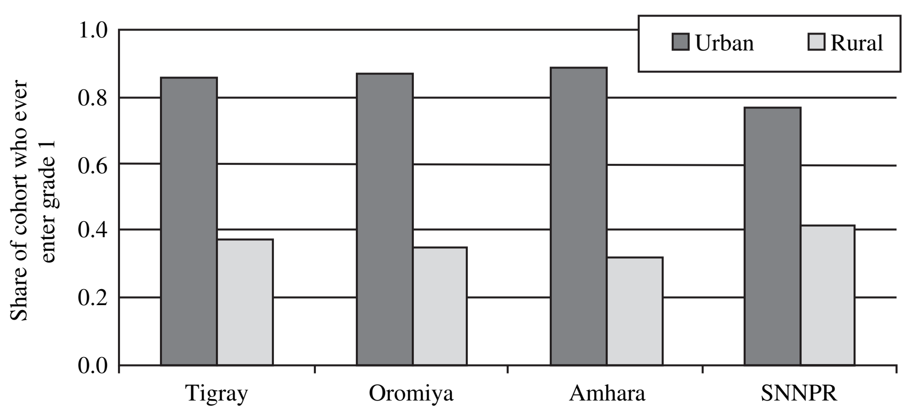
Note: Data on completion rates unavailable for Afar and Somali.

Source: See appendix table A4.2.

entry rates to grade 1, but in both regions, a larger share of the entrants (though still low by the standards of Addis Ababa) persist with their schooling and have higher completion rates, around 30 percent in both regions in grade 4, and around 19 percent in grade 8. For Dire Dawa—the other mostly urban region apart from Addis Ababa—entry rates are reasonably high, 79 percent, but low survival rates, particularly in the early grades of the primary cycle, are a problem; these lower rates make Dire Dawa's completion rate in grade 4 drop to 54 percent, and in grade 8, to 49 percent. Among the remaining regions, the pattern is uniformly one of reasonably high entry rates (with the exception of Afar and Somali where entry rates remain very low—38 and 32 percent, respectively), combined with especially poor survival rates throughout the primary cycle. The exception is Harari, where dropping out appears to be concentrated in the first four grades of the cycle.

In each region, disparities across socioeconomic groups probably lurk behind the regional averages documented above. While a full documentation of these patterns is beyond the scope of the present study, the available data on urban and rural entry rates to grade 1, shown in Figure 4.4 for the four largest regions, paint a picture that is strikingly consistent with the national pattern. In Amhara and Oromiya, the gaps are widest: grade 1 entry rates in rural areas are only about half as high as those in the urban areas. Even in SNNPR where the urban-rural gap in the entry rate is smallest, a rural child is still only about two-thirds as likely to enroll as his or her urban counterpart. More broadly, the bias against rural areas can be deduced by simply comparing the urban areas' share of the primary school population against the corresponding share of the school-age population. Only in the largely urbanized regions such as Addis Ababa, Dire Dawa, and Harari is the ratio slightly above 1. In the remaining regions, the ratio ranges from 1.8 times in Gambella, to 3.8 in Somali and 8.0 in Afar; Tigray, Amhara, Oromiya, and SNNPR ranked in the middle, with ratios of 2.0, 2.2, 2.5 and 2.7, respectively. These figures imply that in all these regions, urban children are at least twice as well represented as rural children in primary schools, and the bias is often stronger.

Figure 4.4. Cohort Entry Rates to Grade 1 in Urban and Rural Areas in Four Regions, Ethiopia, 1999



Note: Results for other regions not shown because of small sample size problems.

Source: Analysis of the 1999 Ethiopia Labor Force Survey.

Socioeconomic Disparities in Ethiopia in Cross-country Perspective. For this analysis we use the data in Mingat (2003), which documented the social disparities in primary schooling in 21 African countries across the same three sets of population groups considered above (boys and girls, urban and rural children, and children from the richest and poorest quintiles). The study used the following indicators in the analysis: the gross enrollment ratios, the cross-sectional entry rate to grade 1, and the cross-sectional completion rate at the end of primary education (which typically lasts six years).[76] We computed similar statistics for Ethiopia for the first six years of its eight-year cycle to improve their comparability to the data for the other countries. In Table 4.6 below, the data for Ethiopia for each of the indicators are shown beside the corresponding average for the 21 countries (which are identified in Figure 4.4). As usual, we compute an index for the comparison by expressing the statistic for the less-favored group relative to that for the more-favored group. As before, the closer the index is to 1.0, the closer are the two groups being compared to parity in their access to education. The last column summarizes the parity between the groups considered here by averaging the indices across all three indicators, while the last row shows the averages across the three sets of comparisons for each indicator. As constructed, the summary index of 0.59 for Ethiopia may be interpreted as a composite measure of the extent to which typically disadvantaged social groups (girls, rural children, and those from the poorest families) lag behind the better-off groups in terms of overall participation, entry to grade 1, and survival and completion rates in grade 6 by gender, urban-rural residence, and consumption wealth.

Focusing first on the comparison between boys and girls, it can be seen that Ethiopian girls lag behind boys to a slightly greater extent than their sisters in other African countries: a shortfall of 23 percentage points from parity compared with the African average of 17 percentage points. The urban-rural contrast shows that in Ethiopia, rural children fall behind their urban counterparts to an even greater degree than elsewhere in Africa: the overall index of parity is only 0.31 compared with 0.63 in the African sample. Finally, the gap between the rich and poor is smaller in Ethiopia than in the average African country in the sample, the relevant indices of parity being 0.69 compared with 0.50; Ethiopia's advantage in this regard is insufficient, however, to counteract the shortfall in the comparisons between boys and girls and urban and rural children. As a result, the overall average across the three indicators and three sets of comparisons gives us a combined parity index of 0.59 for Ethiopia compared with the value of 0.65 in the average African country in the sample. This means that socioeconomic disparities in Ethiopia are generally somewhat greater than elsewhere on the continent (see Figure 4.5 for a ranking by individual country), a result that is attributable in large part to the extraordinary size of the gap between urban and rural areas in Ethiopia.

76. See Chapter 2 for a discussion on cross-sectional entry and completion rates and how they differ from cohort rates. For our purposes here, the alternative estimates generally support similar conclusions about the pattern of social disparities in Ethiopia. Note that Mingat (2003) also includes the implied survival rate from grade 1 to grade 6 (which is simply the completion rate multiplied by the entry rate) in his analysis, but to economize on space, we present only the three indicators listed here.

Table 4.6. Social Selectivity in Primary Education according to Three Cross-Sectional Indicators of Access, Ethiopia and Sub-Saharan African Countries, circa 2000

Indicator	Gross enrollment ratio, grades 1–6 (%)		Cross-sectional grade 1 enrollment rate (%)[a/]		Cross-sectional grade 6 completion rate (%)[a/]		Average of the indices for all three indicators	
	Ethiopia	**Sub-Saharan Africa**	**Ethiopia**	**Sub-Saharan Africa**	**Ethiopia**	**Sub-Saharan Africa**	**Ethiopia**	**Sub-Saharan Africa**
By gender								
Boys	79.5	84.5	104.5	76.9	52.3	47.2	n.c.	n.c.
Girls	64.5	72.1	81.5	66.8	37.4	36.2	n.c.	n.c.
Index (boys=1.0)	**0.81**	**0.84**	**0.78**	**0.87**	**0.71**	**0.77**	**0.77**	**0.83**
By locality								
Urban	115.3	103.5	120.6	88.4	83.8	61.0	n.c.	n.c.
Rural	54.6	70.1	44.8	65.4	7.8	28.0	n.c.	n.c.
Index (urban=1.0)	**0.47**	**0.68**	**0.37**	**0.74**	**0.09**	**0.46**	**0.31**	**0.6**
By consumption quintile[b/]								
Richest	100.9	106.7	110.0	89.9	66.1	68.6	n.c.	n.c.
Poorest	65.4	62.1	88.8	53.3	41.4	23.4	n.c.	n.c.
Index (richest=1.0)	**0.65**	**0.57**	**0.81**	**0.59**	**0.63**	**0.34**	**0.69**	**0.50**
Average of the indices for all three sets of comparison	**0.64**	**0.70**	**0.65**	**0.73**	**0.48**	**0.52**	**0.59**	**0.65**

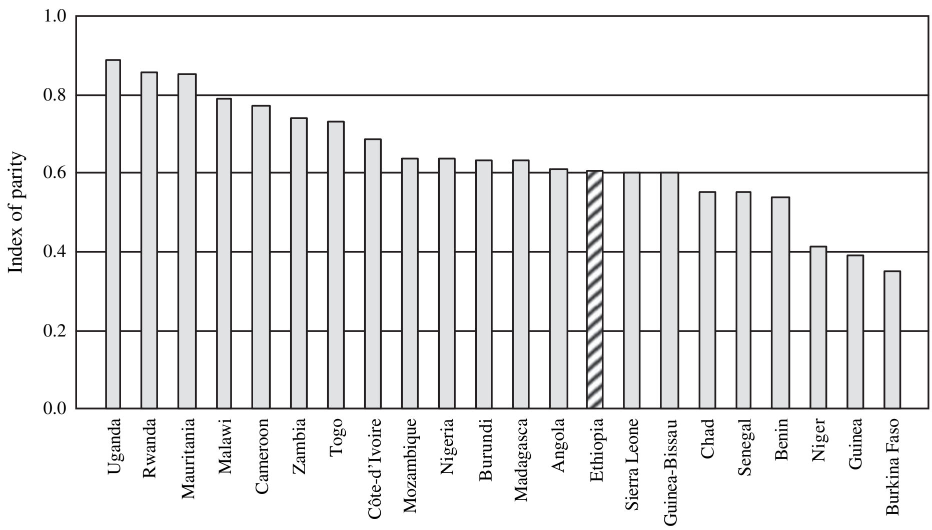
n.c. not computed.

a. Rates refer to the ratio between nonrepeaters relative to the population of the corresponding age group; see Chapter 2 for a detailed explanation on the computation of these rates.

b. Defined by ranking households according to consumption expenditure per adult equivalent.

Source: For Ethiopia, analysis of the 2000 Ethiopia Welfare Monitoring Survey and the 2000 Ethiopia Household Income and Consumption Expenditure Survey; for Sub-Saharan Africa, Mingat 2003, reflecting the data for the 21 countries shown in Figure 4.4.

Figure 4.5. Socioeconomic Parity in Primary Schooling in Ethiopia and Other African Countries, circa 2000



Note: See text for an explanation of the construction of the index of parity. The closer the index is to 1.0, the more equal is the rate of access to primary schooling between boys and girls, between urban and rural children, and between children from the richest and poorest families, access being measured in terms of the gross enrollment ratio, cross-sectional enrollment rate in grades 1 and 6 (and the implied cross-sectional survival rate between these grades).

Source: For Ethiopia, analysis of the 2000 Ethiopia Welfare Monitoring Survey and the 2000 Ethiopia Household Income and Consumption Expenditure Survey; for the other countries, Mingat 2003.

Distribution of Public Spending on Education

Social disparities in schooling are significant in themselves because they affect the future life chances of today's young. As important is the bias they introduce into the incidence of public spending in education. The sections below examine this issue and approach it in two complementary ways. The first looks at the biases associated simply with the structure of enrollments and public spending on education across levels; the second evaluates the biases that reflect the combined influence of social selection and inequities in the overall structure of enrollments and public financing of education.

Spending Pattern Associated with Structural Biases

For a given cohort of children, it is possible to determine the number of children who do not go to school at all and the number who will terminate their schooling at each level of education.[77] Children with no schooling receive no benefit from public spending on education, whereas those who attain higher education accumulate both the spending associated with higher education itself and that associated with the levels they have already completed.[78] The distribution of spending on education in a cohort thus depends on the structure of enrollments, as well as the distribution of spending across levels of education. The degree of inequity in the distribution can be portrayed using a Lorenz curve, which shows the cumulative shares of the cohort by educational attainment on one axis and the shares of resources benefiting each group on the other axis. The degree of inequity can be quantified by calculating the corresponding Gini coefficient.[79] For our purposes, we use an even simpler summary statistic: the share of the resources benefiting the 10 percent best educated in a cohort.[80]

The results for Ethiopia, based on gross enrollment ratios and the distribution of current public spending for 2001–02, appear in Figure 4.6, along with estimates for a large number of low-income countries for which appropriate data from around 1998 are available. Although cross-country comparisons should be drawn with caution because of differences in data quality and coverage and in the structure of the systems, the results support two conclusions. First, in all countries, the best educated always receive more than their population share of public spending on education; this pattern is to be expected, since governments typically subsidize all levels of education. Second, very large differences exist

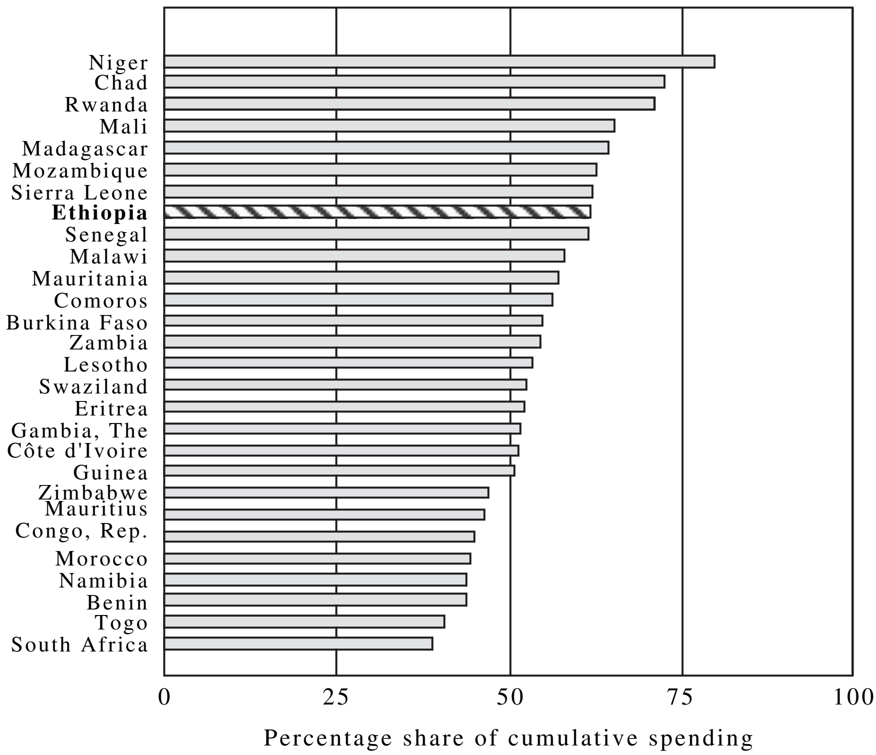
77. To illustrate, suppose the gross enrollment ratio for a country is 80 percent in primary education, 30 percent in secondary education, and 10 percent in higher education. In a cohort of children passing through the system, the distribution of eventual school attainment would be as follows: 10 percent would have attained higher education; 20 percent (= 30 – 10), secondary education; and 50 percent (= 80 – 30), primary education. The remaining 20 percent (= 100 – 80) would have had no schooling. More refined methods can be used to estimate the desired distribution (e.g., using grade-by-grade survival patterns), but sensitivity tests suggest that calculations based on gross enrollment ratios produce reasonably robust estimates for our purposes here.

78. Suppose, for example, that the distribution of current spending is such that primary education receives 55 percent, secondary education receives 30 percent, and higher education receives the remaining 15 percent. The cumulative spending would be 100 units (= 55 + 30 + 15) for those attaining higher education, 85 units (= 55 + 30) for those attaining secondary education, 55 units for those attaining primary education, and 0 for those who did not go to school. The distribution of cumulative spending in a cohort passing through the education system would thus be 23 percent [= 55/(55 + 85 + 100)] for those attaining primary education, 35 percent [= 85/(55 + 85 + 100)] for those attaining secondary education, and 42 percent [= 100/(55 + 85 + 100)] for those attaining higher education.

79. If we continue to use the same numerical examples as in the preceding two notes, the distribution of the educational attainment of the cohort and the corresponding shares of cumulative public spending on education for the cohort would be as follows: 20 percent with no schooling and with 0 share of the cumulative resources; 50 percent attaining primary schooling and receiving 23 percent of the resources; 20 percent attaining secondary education and receiving 35 percent of the resources; and 10 percent attaining higher education and receiving 42 percent of the resources. The Gini coefficient associated with this distribution is 0.57 on a scale that ranges by definition from 0 (each person obtains an exactly proportionate share of resources) to 1.0 (one person gets all the resources). See appendix Figure A4.1 for a graphic representation of this hypothetical example.

80. In cases in which the share of the cohort attaining higher education is less than 10 percent, the best-educated 10 percent would include some who attained secondary education. The share of resources benefiting this group would simply be the sum of the share of those who attained higher education and the prorated share of those who attained secondary education. In cases in which the share of the cohort attaining higher education exceeded 10 percent, the share of resources benefiting the 10 percent best educated would simply be the prorated share of the resources benefiting the group that attained higher education.

Figure 4.6. Share of Cumulative Public Spending on Education, Benefiting the 10 Percent Best Educated in a Generation, Ethiopia and Other African Countries, circa 1998



Congo, Rep. Republic of Congo.

Source: BREDA, World Bank, and UIS 2002, supplemented by estimates for Rwanda reported in World Bank 2003d; and estimates for Ethiopia for 2001–02 based on gross enrollment ratios and distribution of public spending reported in chapters 2 and 3; see the text for information on computational method.

across countries in the degree of bias in favor of the better educated. The share of cumulative resources benefiting the 10 percent best educated in a cohort ranges from about 40 percent in South Africa to about 80 percent in Niger. Ethiopia is located toward the upper end of the spectrum among the 28 countries included in the figure: the best-educated garner some 65 percent of the cumulative resources available to the cohort.[81] Its position is consistent with what one would expect in a system in which higher education enrolls less than 2 percent of the population in the relevant age group and claims nearly a fifth of the gov-

81. As mentioned in Chapters 2 and 3, the gross enrollment ratio in 2001–02 was 61.6 percent for primary education, 13.1 for secondary education (or 13.7 if technical and vocational training and education [TVET] is added here), and 1.7 percent for higher education; and the distribution of recurrent public spending was 50.2 percent for primary education, 17.4 percent for secondary and TVET, and 19.2 percent for higher education; the remaining 13.2 was for administrative overheads which we prorate proportionally across the three levels for the purpose of this calculation.

ernment's total current spending on education. To make the distribution more equitable would probably require a restructuring of the allocation of resources as well as concomitant expansion of coverage at the lower levels. To gain a sense of the magnitude of chances involved, consider the following simulation: a 10-percentage-point increase in the share of primary education financed by a 5-percentage-point reduction in the shares of secondary and higher education, combined with full coverage in primary education, and a doubling of secondary coverage while capping the gross enrollment ratio in higher education at 3 percent, would place Ethiopia in the middle of the range shown in the figure, with the 10 percent best educated capturing 50 percent of the cumulative resources.[82]

Spending Pattern Associated with Social Selectivity in Education

A second perspective on the distribution of public spending on education is the extent to which it favors the wealthier groups in society. Benefit-incidence analysis is a common tool for documenting this aspect of inequity in spending patterns. The approach involves using cross-sectional data on school participation patterns by income group and information on public spending per student to calculate the share of resources benefiting households in each income group.[83] As we have seen earlier, wealthier groups in Ethiopia become increasingly overrepresented as the level of education rises—a pattern found in practically all countries. Benefit-incidence analysis typically shows that although public spending on primary education may benefit lower-income groups more than wealthier groups, the pattern is often not sustained in secondary education and is usually completely reversed in higher education. The aggregate impact, taking into account all levels of education, usually shows the wealthier groups receiving more than their population share of public spending on education. The results in Table 4.7 for Ethiopia confirm the classic patterns documented in studies of the benefit-incidence of from public spending on education in low-income countries.

Table 4.7. Benefit Incidence of Public Spending on Education, Ethiopia, circa 2000

Consumption dsdsquintile[a/]	Share of public spending on indicated level of education (%)			
	Primary	Secondary	Higher	All levels
1 (Poorest)	20	11	3	15
2	22	15	4	17
3	20	18	9	18
4	20	23	22	21
5 (Richest)	17	34	62	29
All	100	100	100	100

a. Households are ranked according to consumption expenditure on food and nonfood items.
Source: Analysis of the 2000 Ethiopia Welfare Monitoring Survey and the 2000 Ethiopia Household Income and Consumption Expenditure Survey; and estimates of public spending per student for 2001–02 reported in Chapter 3.

82. Because higher education enrolls less than 10 percent of the population, the 10 percent best educated would include all those attaining higher education as well as some with secondary education.

83. For further details on the method of calculation, see Demery (2000).

The real issue, however, is one of degree of bias in the incidence of public spending. Table 4.8 compares the results in Ethiopia for 2000 with those for 10 other African countries and 18 non-African developing countries for which similar calculations have been made. In Ethiopia, the poorest 20 percent of households accounted for 15 percent of public spending on all levels of education, while the richest 20 percent received 29 percent. Judging by the relative sizes of these shares, we see that Ethiopia stands somewhere in the middle among both the group of Sub-Saharan African countries, and the group of other developing countries shown in the table. In other words, the country's public sector spending on education is neither as equitable across income groups as it could be, nor is it as inequitable as in some other countries.

Issues for Policy Development

Ethiopia's education system can be oriented to better serve less fortunate population groups. Policies that expand the base of the educational pyramid and restructure the allocation of public spending in favor of the lower levels of education would be important, as would those that reduce the disparities in educational participation across social groups, particularly between urban and rural children. Narrowing the gaps in primary education is arguably a priority, not only because the differences in entry and survival rates at this level are large, but also because these differences are a root cause of the severe underrepresentation of rural youths in secondary and higher education. Below we report on the regression results of the potential role that supply- and demand-side interventions can play to promote schooling for rural children and other disadvantaged groups.[84] These results are based on data pieced together from various cross-sectional surveys and school censuses that were available at the time of data analysis[85] While the ad hoc nature of these data and other flaws make it difficult to be precise about the relative importance of these factors and the specific variables that matter most, they nonetheless provide some interesting perspectives on the issue at hand.

Managing Constraints on the Supply Side

That the accessibility of schools is an important constraint is suggested by simple cross-tabulations based on the 2000 Ethiopia Welfare Monitoring Survey (Table 4.9). For example, a third of rural children in 2000 still lived at least 5 kilometers from the nearest

84. Note that although we simplify the presentation here by discussing supply- and demand-side factors separately, the distinction is not strict because of interactive effects. When the supply of schooling is made more responsive to local conditions, for example by locating them closer to children's homes and adjusting the school calendar to match the agricultural cycle, the direct and opportunity cost of school attendance is reduced; this makes schooling more attractive to parents and increases their willingness to send their children to school.

85. See Schaffner (2003), a background paper prepared for this study, for details on data preparation and the multivariate results summarized here. Her analysis is based on data from the following datasets: the Ethiopia Welfare Monitoring Surveys and Ethiopia Household Income and Consumption Expenditure Surveys of 1995, 1998, and 2000; the 1999 Ethiopia Labor Force Survey; and 2000 Ethiopia Demographic and Health Survey; see Appendix Tables A4.4 to A4.6 for the key econometric results.

Table 4.8. Share of Public Spending on Education Benefiting the Poorest and Richest Population Quintiles, Ethiopia (1999–2000) and Other Countries (1990s)

Country	Percentage share of spending[a/]			Richest quintile's share as multiple of poorest quintile's share
	Year of survey	Poorest quintile	Richest quintile	
Ethiopia	1999–2000	15.2	28.9	1.9
Other African countries				
South Africa	1993	21.1	23.4	1.1
Kenya	1992/93	16.7	20.7	1.2
Ghana	1992	16.4	20.8	1.3
Malawi	1994/95	16.0	25.0	1.6
Rwanda[b/]	2000	15.0	28.0	1.9
Uganda	1992	13.0	32.0	2.5
Côte d'Ivoire	1995	13.5	34.8	2.6
Tanzania	1993	13.0	38.0	2.9
Guinea[b/]	1994	8.5	26.9	3.2
Madagascar[b/]	1997	7.0	36.0	5.1
Other low-income countries				
Uruguay	1998	27.6	14.7	0.5
Colombia	1992	23.0	14.0	0.6
Romania	1994	21.5	17.1	0.8
Panama	1997	19.8	17.5	0.9
Jamaica	1992	18.0	21.8	1.2
Peru	1994	14.8	22.1	1.5
Morocco	1991	14.8	22.8	1.5
Ecuador	1994	15.0	26.8	1.8
Kyrgyz Republic	1993	14.1	26.5	1.9
Indonesia	1989	15.0	29.0	1.9
Pakistan	1991	14.3	29.1	2.0
Guyana	1993	14.5	32.1	2.2
Laos	1993	12.0	34.0	2.8
Vietnam	1991	12.2	35.4	2.9
Kazakhstan	1996	8.4	26.0	3.1
Armenia	1996	7.0	29.0	4.1
Nepal	1996	10.5	46.0	4.4
Nicaragua	1993	9.1	40.1	4.4

a. Refers to distribution of public spending on all levels of education; quintiles are typically defined according to a ranking of households by consumption expenditure per adult equivalent.
b. Data refer to the distribution of spending on primary and secondary education only.
Source: For Ethiopia, Table 4.7; for Rwanda, as reported in World Bank 2003d; for Madagascar, as reported in World Bank 2002; for the remaining countries, World Bank EdStats database based on various household surveys on living standards.

Table 4.9. Distribution of Children Ages 7–14 and Their School Participation Rates by Distance to Nearest Primary School, Ethiopia, 2000

	Distance from home to nearest primary school				
Locality	**0**	**1–2 km.**	**3–4 km.**	**5 km. +**	**All**
Percentage of children living at various distances from school					
Urban	47.4	45.3	6.2	1.1	100
Rural	15.4	28.1	27.8	33.3	100
Total sample	19.6	30.4	24.9	25.1	100
Percentage of children within distance categories who are registered for school					
Urban	85.5	83.1	78.9	71.0	84.0
Rural	43.6	38.8	32.6	19.8	32.4
Total sample	57.0	47.4	34.1	20.0	41.6

Source: Analysis of 2000 Ethiopia Welfare Monitoring Survey.

primary school. Multivariate analysis reported in Schaffner (2003) suggests that when differences across households are controlled for, each additional kilometer of distance from the nearest primary school reduces school registration rates by 2 to 3 percentage points, up to distances of 12 to 15 kilometers. In other words, reducing the distance to school from 10 kilometers to 0 (to within the neighborhood) could raise registration rates by 20–30 percentage points—a substantial increase by any measure.

The significant influence of distance from school on school registration rates probably reflects a variety of forces at work. In a context where most people in rural areas travel on foot, children who live farther from school must expend more time in getting to school, and their journey is often physically more arduous and dangerous; adolescent girls face the added risk of possible abduction for unwanted marriages. Time for schooling may also be harder to spare in households living farther from school, if these households also have more limited access to markets and other social services and must therefore devote more time to managing their livelihoods. The most obvious way to reduce the various distance-related barriers to schooling is to build more schools to create a network of facilities that are more accessible. This development might also make Ethiopian families more willing to send their children to school at younger ages, thus improving the chances that the children would remain in school beyond the first few grades. Other policies might also help. For example, road construction and improvements would make it easier for children to reach their school and do so in less time. Encouragement of intermediate modes of transportation (including bicycles and perhaps small, motorized, multipassenger vehicles) might improve physical access to schools that already exist, while at the same time facilitating a wider range of developmental benefits. Further, new methods of guaranteeing the safety of children in transit to school (for example, cooperatives of parents who take turns walking children to school) might also be effective. Because the nature of the challenges presented by distance from school, as well as the feasible approaches to reducing those challenges, are likely to vary across communities, the inhabitants in each locality must obviously play a key role in helping identify the main access problems and ways to address them.

Regarding the data in Table 4.9, it is clear that distance is far from being the only determinant of school registration: among children in areas with a school in the neighborhood, less than 44 percent registered for school in rural areas; the percentage is much higher, 86 percent, in urban areas, but it nonetheless falls short of being universal.[86] These patterns imply that if school attendance is to be improved, constraints on other supply-side factors besides access to school probably also warrant attention. For example, when taken together, all the variables describing school supply (which describe numbers of schools and teachers in several grade ranges, as well as indicators of school infrastructure and teacher qualifications) explain a large fraction of the differences in enrollment rates across localities that are not explained by differences across households.[87] A more detailed analysis of the specific school factors that matter cannot be pursued with the available data, but it is clear that the government must consider improving schooling conditions in any attempt to raise school participation rates.

Addressing Constraints on the Demand Side

The multivariate analyses suggest that aside from supply-side conditions, demand-side factors also affect school participation in important ways. Differences across households in their degree of poverty, in the opportunity cost of children's time, and in parental perceptions of the value of education generate important differences in school registration rates. The language group of the household also affects registration rates, presumably because education provided in a language other than the household's primary language appears either difficult or of low potential benefit. Even after controlling for household and community characteristics, we see that registration rates differ between boys and girls and between orphans and other children; this suggests that household decision makers perceive higher benefits of education or lower costs of education for boys than for girls, and for natural children than for foster children. While characteristics such as gender, orphan status, and language are impervious to policy interventions, particularly in the short run, documenting their impact helps in understanding the importance of modifying the ways household decision makers and the school system respond to the needs of different groups, and in identifying target groups for special attention. Other determinants of registration rates, such as household income levels, may themselves be influenced by policy. Documenting their importance can also help shed light on the potential usefulness of specific policy efforts.

86. The fact that schools offer incomplete cycles of instruction has been found to be an important constraint on school attendance in some countries. In Ethiopia, more than 90 percent of the first-cycle primary schools offer all four grades of instruction. Yet only 60 percent of first-graders reach grade 4, suggesting that incompleteness of instruction is probably not a major factor for dropouts.

87. The analysis also hints at the possible importance of broader supply-side factors such as the availability of secondary schools and other indicators of school quality (e.g., the availability of school libraries, which may be a proxy for differences on overall investment in the school system across localities). Given the collinear and crude nature of the available data, these results, while consistent with similar research in other countries, would need to be corroborated with further research.

Income Constraints. Among households with children ages 7–14 years that were surveyed in 2000, annual consumption per adult equivalent ranges from an average of US$90 in the poorest quintile, to an average of US$386 in the richest quintile. The differences in consumption wealth exerts a modest impact on school participation, but the multivariate analysis suggests that after controlling for supply-side conditions and other household and personal characteristics, moving children from the poorest quintile to the richest quintile would, on average, raise attendance rates by a modest 6–10 percentage points. It is important to note, however, that the effect of income is stronger among younger children: the same shift would raise attendance rates by more than 18 percentage points; and it also appears to be stronger among children who live within five kilometers from the nearest primary school. These results suggest that income matters, that its influence is likely to grow as the age of the target population falls, and that it becomes an effective barrier as the direct costs of attending school decline.

Taken at face value, the effects of income (other characteristics of households and regions being constant) uncovered in the regression analysis suggest that providing cash transfers to poor households would boost school attendance. The modest size of the estimated effects indicates, however, that a blanket distribution of cash transfers to poor families would yield small effects at large cost. Making the cash transfers conditional on sending children to school could, if feasible, reduce program costs because families for whom the extra income would not induce them to send their children to school would not make a claim; it might also increase the impact because it would change the tradeoffs associated with use of the child's time as well as increase household income. Moreover, the cost-effectiveness of the program could be enhanced by tightening the criteria for targeting the transfers. However, the available data are insufficient for quantifying the potential impact of a program of targeted conditional cash transfers. In a broader sense, the estimated effects of income might best be understood as measuring average effects—relatively few households would experience important income effects on school registration, and many others would experience no effect. These results imply that cash transfers are likely to yield different results across communities: in areas where good schools are available and many children work at low wages, a small cash transfer might encourage many families to send children to school at the expense of work. In communities where child labor has a high return, where schools are inaccessible and offer poor services, or where parents believe schooling produces few benefits, a small cash transfer would have little impact. Community involvement in the choice to allocate education expansion funds to cash transfer programs would thus be useful and a careful, experimental approach to implementing such programs warranted.

Opportunity Costs as a Barrier to Schooling. When a child's presence in school conflicts with participation in work activities—whether at home, on the family farm, or in the labor market—families are said to incur an opportunity cost in enrolling a child at school. The data suggest that more than half of rural Ethiopian boys and nearly a third of rural girls report having worked in a range of activities that might constitute a "job."[88] Children who

88. More detailed information on child labor is contained in the 2001 Child Labor Force Survey. Unfortunately, access to the data was not available at this writing, Thus the discussion here relies on what can be culled from the 1998, 1999, and 2000 Welfare Monitoring Surveys and the 2000 Demographic and Health Survey.

work are generally less likely to attend school, but it appears that not all work is incompatible with schooling. This interpretation is consistent with the modest size of the impact of children's work on schooling reflected in the multivariate analyses: all else being unchanged, a 10 percent increase in the unemployment rate among household heads reduces child participation in work by 1.8 percentage points, and raises school attendance rates by 0.6 to 0.8 of 1 percentage point.[89] In urban areas, the estimates suggest that the addition of each young child in the household (which increases the demand for childcare by older siblings, especially sisters) reduces by 4 percentage points the school participation rate of girls, while increasing participation in unpaid domestic work by a comparable amount.

Perceived Value of Schooling. In a country where schooling rates are as low as in Ethiopia, a plausible barrier to the schooling of children may simply be the fact that parents themselves have not been to schools and have no idea what schools can do for their children. Descriptive information from the Welfare Monitoring Surveys reveals, for example, that among rural households who were asked why they have not sent their children to the nearest primary school, a higher percentage answered "no experience" or "have no need of it" than "too expensive" or "too far" or "poor quality."[90] The multivariate analysis shows that a child's chances of being enrolled is influenced by the percentage of household heads in a locality (excluding the child's own household head) who are literate, even after controlling for such factors as household poverty, distance from school, and whether or not the child's own household head is literate. The fact that the impact of parental literacy diminishes sharply with the inclusion of community-level literacy rates in the regression specification suggests that beliefs about the importance of schooling may be formed at the community level, and that exposing communities to the potential benefits of schooling may be a more useful approach for enhancing school participation than targeting each school-aged child's parents more specifically.

Mother Tongue, Gender, and Orphanhood. Finally, the available data also allow an assessment of the impact of these potentially important factors. A simple tabulation of data from the 2000 Demographic and Health Survey shows substantial differences in school participation across language groups (Table 4.10), particularly in rural areas. In multivariate analysis, these gaps are diminished only modestly after controlling for the influence of a full range of regional and household factors for which data are available in that dataset. The effect of language persists even when the regression analysis introduced enumeration area dummy variables to capture community-specific effects. The results lend themselves to the interpretation that it is language *per se,* and not just associated differences in culture and prosperity, that cause registration rates to differ. In light of these results, the introduction of the mother tongue as a medium of instruction in the government's 1994 new education policy is thus entirely consistent with the policy's intention to facilitate expansion of primary school participation throughout the country.

89. Among rural boys, the number of household members who are male adults is negatively associated with school participation, perhaps because the productivity of their time on the farm is enhanced by the presence of adult males who can supervise and teach them.

90. Note, however, that half of the responses to the question were coded "other," making the information inconclusive.

Table 4.10. Percentage of Children Ages 7 to 14 Years Currently Registered for School, by Mother's Native Language, Ethiopia, 2000

	Sample size		Percentage registered for school		
Mother tongue	Total number of observations	Percentage of rural	Overall	Rural	Urban
Amarigna	2,763	64.4	42.1	31.5	88.1
Ormigna	2,717	87.6	29.2	25.1	83.7
Tigrigna	1,124	82.7	38.9	24.8	85.5
Somaligna	825	83.9	17.4	11.4	35.7
Afarigna	478	99.4	13.2	12.9	. .
Other	2,392	91.4	29.5	27.7	69.6
All groups	10,807	81.9	33.9	27.3	83.3

. . Data not shown because there were only three observations in the urban sample of children in the relevant language group.
Source: Analysis of the 2000 Demographic and Health Survey as reported in Schaffner 2003.

With regard to girls and orphans, much of what the multivariate analysis has to say is already evident in the cross-tabulations presented in earlier sections. Gender gaps are primarily a rural phenomenon, and appear to be region-specific, implying that efforts to school participation by girls will require a region-by-region approach. In this regard, it is noteworthy that some supply-side factors may also be at work. In a study of out-of-school children, Rose (2003) found, for example, that most teachers surveyed believed that girls were not as intelligent as boys. Such attitudes are obviously likely to affect girls' performance in school and thus bias their chances of continuation. For orphans, the multivariate results show that after controlling for a variety of household, community, and regional characteristics, children who have lost one parent are 5–6 percentage points less likely to attend school than nonorphans, and that the effect is twice as great for children who have lost both parents. That orphans are at a disadvantage is evident from the regression results showing that such children are less likely to enroll in school than the biological children of the household head with whom they live.

Conclusion

At present fully 40 percent of each cohort of Ethiopian children still do not start first grade, and of those who do, an estimated 47 percent exit the system before attaining grade 5.[91] As in other countries, significant disparities exist around these national averages, between girls and boys, rural and urban children, and those in rich and poor households. In Ethiopia, the

91. Recall from Chapter 2 that cohort rates of entry differ from cross-sectional estimates which show intake rates at nearly 100 percent. The latter takes into account the impact of multiple cohorts of children entering school, some of them at relatively late ages, as the schools are opened. In time, however, the multiple cohort effect will dissipate, and the cross-sectional cohort rates may converge over time.

urban-rural gap is especially wide, not only across the three sets of comparisons, but also when compared with the pattern in other countries. Global progress toward universal primary school completion will inevitably require efforts to improve entry and survival rates among Ethiopia's rural children, even as efforts to facilitate participation by girls, orphans, and other vulnerable population groups are maintained. Regarding the specific interventions that might be considered, the available data are admittedly limited in scope, but they nonetheless offer some guidance. Situating schools closer to children's homes in rural areas, or improving their accessibility in other ways, will be important. However, improving physical accessibility alone is unlikely to have much impact unless accompanied by efforts to improve the quality of the services (as perceived by parents through the attributes of the schools that can be observed); action to boost parental confidence in the benefits of schooling for their children; and special outreach to particularly vulnerable groups such as orphans.

CHAPTER 5

Service Delivery in Primary and Secondary Education

This chapter presents an overview of the network of primary and secondary schools and its characteristics, and documents the supply of services as reflected in urban-rural and regional differences in facilities, staffing patterns, and teacher allocation across schools. It also evaluates economies of scale in service delivery at both levels of education, and consolidates the available information on student learning to complete the discussion. The data reveal a system dominated by government schools, many created relatively recently to expand schooling at the base of the educational pyramid. The rapid growth of the system has brought to light the limits of current policies, particularly those relating to standards for teacher recruitment and school construction. That these standards may be unaffordable given the budget constraints that the sector faces is manifested in: the country's very high pupil-teacher ratios, among the highest in the world today; overcrowded classrooms and schools; incomplete instructional programs in many schools; and the ways in which regional governments and local communities have accommodated the shortages of staff and space. Decentralization offers a way out of some these problems, but only if it frees subnational governments to adapt standards of service delivery to local budget realities, fosters parental participation in school management, and creates a culture of accountability for results throughout the system.

Overview of the Network of Schools

Ethiopia currently has a network of some 12,000 primary and secondary schools spread all over the country. Below we provide an overview of the institutional composition of the system, its growth over time, and the instructional services the schools offer.

Composition of Government and Nongovernment Schools. The system at both the primary and secondary levels comprises predominately government schools (Table 5.1). Although the nongovernment sector is relatively small, it consists of a variety of institutions. Of those offering primary schooling, 46 percent are privately financed mission schools with religious affiliations; 37 percent are so-called "public schools," most of which are concentrated in Addis Ababa (where they receive partial government funding for teacher salaries) and in Oromiya (where they are generally financed by community contributions).[92] The remaining 17 percent are secular schools (including "community schools" that serve foreign communities), which are financed by student fees. At the secondary level, mission schools make up 76 percent of the nongovernment institutions, while secular schools make up the remaining 24 percent. Across regions, nongovernment schools make up larger shares of the total supply of schools in the more urbanized regions of Ethiopia, namely, Addis Ababa, Dire Dawa, and Harari (Figure 5.1).

Table 5.1. Distribution of Primary and Secondary Students and Schools by Sector, Ethiopia 2001–02

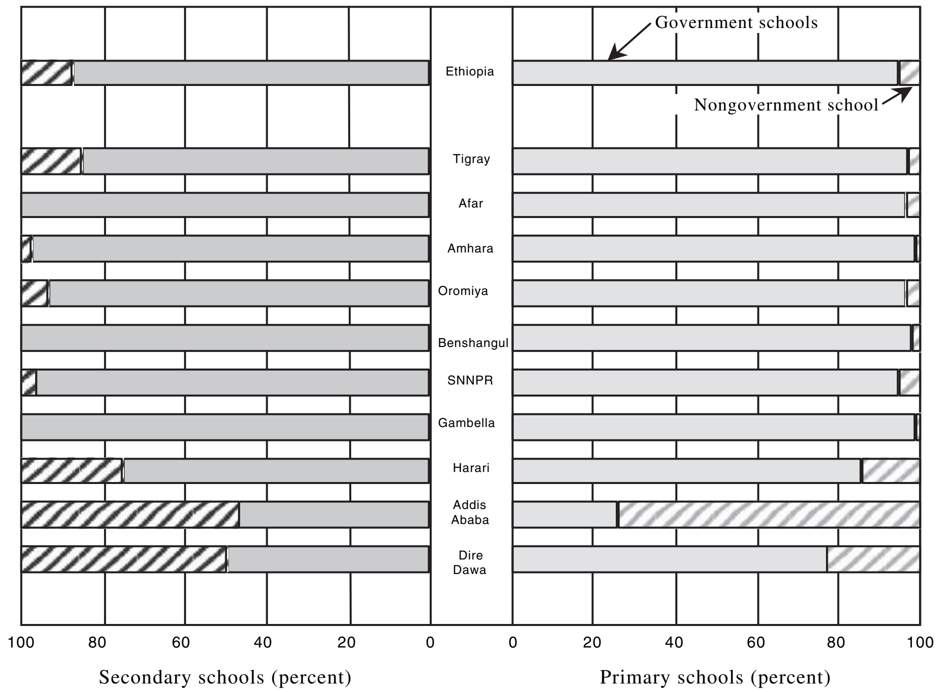
		Percentage share by sector	
Level of education/item	**Number**	**Government**	**Nongovernment**
Primary education			
Schools	11,754	94.9	5.1
Students	7,876,188	95.3	4.7
Secondary education			
Schools	436	87.6	12.4
Students	679,377	97.7	2.3

Note: The total number of schools differs from the 12,438 reported in the Ministry of Education's Statistical Abstract for 2001–02 (i.e., 1994 E.C.) for several reasons: (i) schools are counted more than once in this table if they offer instruction at both the primary and secondary levels; (ii) schools from Somali are excluded for lack of data in the school census; (iii) schools identified as offering technical and vocational education and training in the census are excluded; and (iv) schools reporting no teachers or no students are excluded.
Source: Analysis of the Ministry of Education's 2001–02 Ethiopia school census.

In Ethiopia, schools may also be distinguished according to their instructional program. For example, some schools offer only the first cycle of primary schooling, while others offer the full cycle. Table 5.2 shows that the bulk of the schools offer primary education only, while less than 3 percent offer secondary education only, and an even smaller share primary and secondary education under one roof (the latter type of school nonetheless accounts for more than 6 percent of nongovernment schools). Among government primary schools, 59 percent offer both cycles of instruction, while the remaining schools offer only grades 1–4; by contrast, the share of nongovernment schools that cover both cycles is much

92. As indicated in Chapter 2, most of the "public schools" were started years ago as private institutions but were nationalized by previous governments and then denationalized.

Figure 5.1. Percentage Distribution of Government and Nongovernment Primary and Secondary Schools by Region, Ethiopia, 2001–02



Benshangul, Benshangul-Gumuz; SNNPR, Southern Nations and Nationalities Peoples Republic.

Note: Solid portion of each bar refers to the share of government schools; striped portion, to the share of nongovernment schools; data unavailable for Somali.

Source: Analysis of Ministry of Education's 2001–02 school census.

higher, 72 percent. At the secondary level, some schools offer only grades 9–10, while others also offer grades 11 and 12. Among both government and nongovernment schools, those that have classes in all four grades account for most of the secondary schools. As discussed later in this chapter, the tendency for schools to offer the full range of secondary grades is consistent with what one would expect given the existence of economies of scale at this level of education and the implication that schools need to reach a certain size to operate economically. Finally, although not shown in Table 5.2, substantial variation exists between urban and rural schools (see Appendix Table A5.1): at the primary level, 55 percent of the rural schools offer the full primary cycle, compared with 79 percent in urban sample; and at the secondary level, 42 percent of the rural schools provide instruction at grades 9–12, compared with 75 percent in urban schools.

Growth of the System. As further background on the school system, it is useful to take note of the way the system has grown over time (Table 5.3). Among first-cycle government primary schools, less than 10 percent existed before 1977 and about the same share was cre-

Table 5.2. Distribution of Government and Nongovernment Schools by Instructional Program, Ethiopia, 2001–02

	Percentage distribution of schools by instructional program			Percentage distribution within each instructional category		
Level of instruction offered	**Govt.**	**Nongovt.**	**Both sectors**	**Govt.**	**Nongovt**	**Both sectors**
Primary education only[a/]	96.7	91.2	96.4	—	—	—
Grades 1–4	40.1	25.6	39.3	41.5	28.1	40.8
Grades 1–4 and grades 5–8	56.6	65.6	57.1	58.5	71.9	59.2
Secondary education only[b/]	2.8	2.6	2.7			
Grades 9–10	0.3	0.5	0.4	12.7	18.8	13.0
Grade 9–10 and grades 11–12	2.4	2.1	2.4	87.3	81.3	87.0
Combined primary and secondary[c/]	0.6	6.2	0.9	—	—	—
All schools	100.0	100.0	100.0	—	—	—
Memorandum:						
Total number of schools	11,470	617	12,087	—	—	—

—not applicable.
a. Excludes the 0.8 percent of schools that offer instruction only in grades 5–8.
b. Excludes the 1.3 percent of schools that offer instruction in only grades 11–12.
c. Grades 1–12.
Source: Analysis of the 2001–02 Ethiopia School Census of the Ministry of Education.

ated between 1987 and 1993; the latter period straddled the waning years of the Mengistu regime and the start of the new government. About 36 percent came into being between 1977 and 1987, that is, under the Mengistu regime, and 45 percent since 1993 under the new government. The stock of schools that offer both cycles of primary schooling grew much more slowly: only 7 percent of the schools were created since 1993; while 35 percent were started between 1967 and 1977, and 39 percent between 1977 and 1987. In the nongovernment sector, the schools offering grades 1–4 are generally newer than their government counterparts, 39 percent of them having been created since 1997. By contrast, the schools offering grades 1–8 tend to be older than similar government schools: nearly 32 percent had been established by 1967, and 62 percent by 1977. Taken as a whole, the school growth data are consistent with the conclusion reached in Chapter 2 that expansion of the base of the educational pyramid has been a key focus of the present government's sector policy.

Composition of Schools by Highest Instructional Grade Offered. To complete this overview of the supply of schools, Table 5.4 shows the distribution of schools, nationally and regionally, according to the highest grade offered. These more detailed data are important because where instructional programs are incomplete, some pupils may leave the system sooner than desired or repeat the highest grade offered at the school they attend, not because of demand-side constraints or poor progress at school, but because they simply have nowhere

Table 5.3. Percentage Distribution of Government and Nongovernment Primary Schools by Date of Establishment, Ethiopia, 2001–02

	Government schools			Other schools		
Date of establishment	Grades 1–4 only	Grades 1–8	All	Grades 1–4 only	Grades 1–8	All
Before 1957	0.4	6.2	3.8	5.4	15.3	12.8
1957–67	0.5	6.9	4.2	3.4	16.2	12.9
1967–77	8.3	34.7	23.7	8.2	30.4	24.7
1977–87	36.5	38.7	37.8	18.4	11.5	13.3
1987–93	9.6	6.4	7.7	6.1	11.1	9.8
1993–97	22.6	6.1	13.0	19.1	8.5	11.2
1997–2001	22.1	1.0	9.8	39.5	7.1	15.4
All schools	100	100	100	100	100	100
Memorandum:						
No. of schools	4,548	6,371	10,919	147	425	572

Note: Number of schools based on sample for which information is available in the census data on date of creation.
Source: Analysis of the 2001–02 Ethiopia School Census of the Ministry of Education.

else to go in the system. In Ethiopia, only a fifth of government primary schools offer instruction up to grade 8 (and these are generally the oldest schools), while just over 31 percent stop after grade 6, and 34 percent, after grade 4. The data also show that rural schools are more likely than those in urban areas to offer an incomplete instructional program. Especially in rural areas, the legacy of the previous 6-2-4 structure of education system is evident in the large share of schools there that stop at grade 6. Most of these schools were created around 1980 and appear not to have evolved to match the new structure of the system. Schools that stopped at grade 4 were created, on average, around 1987, and most also appear not to have developed beyond the scope of their initial instructional program. Schools that offer less than the first four grades make up less than 8 percent of Ethiopia's primary school. Nearly 69 percent of them are new in the sense that they have not been around long enough to fill out the complete instructional menu. A noteworthy fact is that these schools have, on average, a significantly higher pupil-teacher ratio than other schools, which suggests that staffing constraints may be one factor standing in the way of their development.

The table also reveals strong regional contrasts. In Addis Ababa, for example, most of the primary schools offer instruction up to grade 8, but in Dire Dawa and Harari, the other relatively urbanized regions, only 25 and 34 percent, respectively, of their primary schools do. The difference is one explanation why grade 8 completion rates in Dire Dawa and Harari are, respectively, only 59 percent and 42 percent as high as in Addis Ababa (see Figure 4.2 in Chapter 4). The incompleteness of instructional program is obviously not the only reason for low finishing rates; for example, Tigray and SNNPR (where entry rates to grade 1 are comparable) have a similar share of schools that stop at grade 4, but grade 4 completion rates in SNNPR are only about half as high as in Tigray. Nonetheless, the sizable share of schools in both cycles that do not offer the full program remains a matter of concern given the generally negative correlation across regions between the two variables.

Table 5.4. Distribution of Government Primary Schools by Highest Grade of Instruction Offered, Ethiopia, 2001–02

		Percentage distribution of schools by highest grade of instruction offered						
Locality/region	Number of schools	Grade 3 or lower	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	All schools
Ethiopia	10,919	7.6	34.0	4.4	31.4	2.5	20.1	100.0
By locality								
Urban	1,303	4.8	11.9	1.8	16.4	2.7	62.4	100.0
Rural	9,616	8.0	37.0	4.7	33.4	2.5	14.3	100.0
By Region[a/]								
Tigray	878	15.7	23.6	7.9	27.0	3.3	22.6	100.0
Afar	119	33.6	31.9	1.7	15.1	2.5	15.1	100.0
Amhara	2,898	5.0	39.2	2.8	38.2	0.6	14.2	100.0
Oromiya	4,306	7.7	36.9	4.3	23.5	3.4	24.1	100.0
Benshangul-Gumuz	265	13.2	43.4	3.8	23.4	3.8	12.5	100.0
SNNPR	2,186	5.4	25.1	5.4	43.6	2.7	17.7	100.0
Gambella	110	11.8	46.4	6.4	15.5	1.8	18.2	100.0
Harari	38	5.3	34.2	2.6	23.7	0.0	34.2	100.0
Addis Ababa	75	0.0	5.3	1.3	8.0	2.7	82.7	100.0
Dire Dawa	44	18.2	22.7	6.8	13.6	13.6	25.0	100.0
Memoranda:								
Percentage of distribution of new first-graders[b/]		5.4	23.5	3.7	32.5	3.1	31.8	100.0
Average year schools were created		1997	1987	1985	1980	1978	1971	1982
Percentage of the schools that are new[c/]		68.8	10.7	11.1	2.2	5.4	3.8	11.0
Average pupil-teacher ratio		84.5	73.6	82.4	79.1	77.8	72.5	76.3

SNNPR Southern Nations and Nationalities Peoples Republic.
Note: number of schools differs from counts reported in the published statistics because schools with missing data are excluded here.
a. Data unavailable for Somali.
b. The number of new entrants totaled 1,599,110 for Ethiopia as a whole, excluding Somali.
c. Schools created no more than n years ago, where n is the highest grade of instruction offered by the school.
Source: Analysis of the Ministry of Education's 2001–02 Ethiopia School Census.

Selected Characteristics of Schools

We now describe a few key operational features of the schools in Ethiopia. The focus is on government schools, which dominate the system, but data on nongovernment schools are also shown to sharpen the comparative perspective.[93] Some key differences across regions are highlighted as appropriate.

Use of Facilities for Multiple Shifts. In Ethiopia, one or more shifts of students may be using the schools.[94] Those that operate one shift are expected to provide 1,100 instructional hours a year, while those on double shift typically fit in 840 hours a year for each shift of students (Table 5.5).[95] Schools operating multiple shifts (typically two) account for 44 percent of the primary government schools, compared with 19 percent among nongovernment schools,

Table 5.5. Prevalence of Double Shifting and Section and School Sizes of Government and Nongovernment Primary and Secondary Schools, Ethiopia, 2001–02

	Primary schools		Secondary schools	
Indicator	**Government**	**Nongovernment**	**Government**	**Nongovernment**
Official instructional time (hours per week)[a/]				
Single shift	1,100	—	1,100	—
Double shift	840	—	840	—
Percentage of schools operating two or more shifts[b/]	44.3	19.3	78.6	16.7
Number of students per section[c/]	72.1	60.1	80.4	51.1
Grades 1–4	75.9	61.9	n.a.	n.a.
Grades 5–8	60.7	54.8	n.a.	n.a.
Number of sections per school[c/]	9.0	9.9	21.0	6.0
Number of students per school[c/]	673	611	1,741	290
Memorandum:				
Number of schools in sample	11,047	596	378	54

—Data not available.
n.a. Not applicable.
a. Computed as follows: average of 7 daily periods of 45 minutes each in single shift schools; and 6 daily periods of 40 minutes in double shift schools, in a school year of 210 days.
b. Each shift of students has its own set of teachers, but administrative staff, including the school head, is shared by the various shifts.
c. Refers to averages per school or section.
Source: Analysis of the Ministry of Education's 2001–02 Ethiopia school census.

93. As before, unless otherwise indicated, the statistics in this section are computed using the school as the unit of observation.

94. Note that teachers in Ethiopia teach only one shift of students (or the equivalent of one shift, since those in schools with multiple shifts may sometimes arrange their teaching schedule to cover classes from different shifts of students).

95. The range is comparable to the official arrangements in most other developing countries. For a variety of reasons—including adaptations to suit local conditions, teacher absenteeism, and so on—the actual hours may be smaller and may vary across locality.

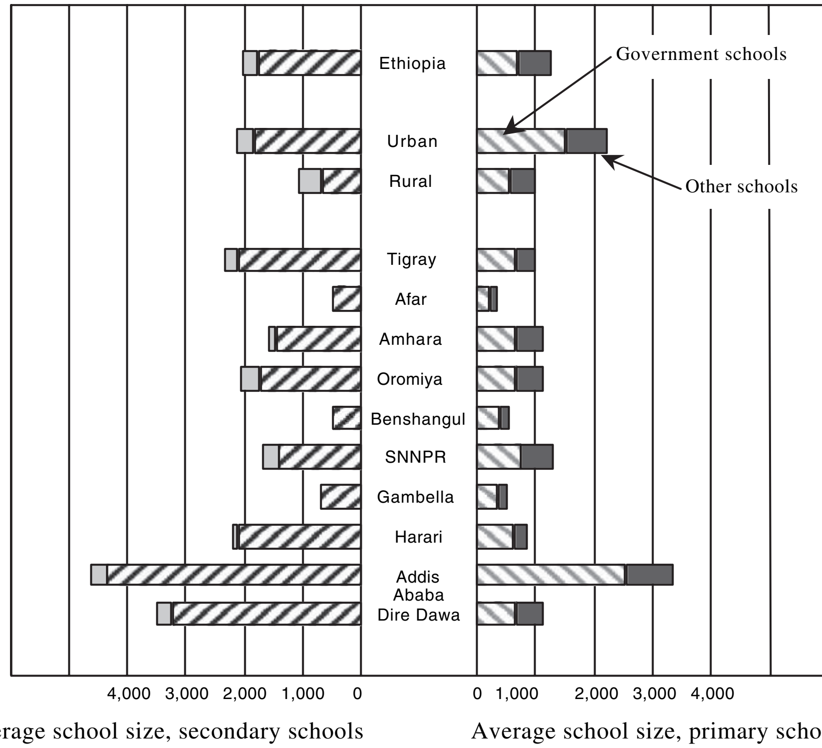
and nearly 80 percent of the secondary government schools, compared with 17 percent in the nongovernment sector. Important differences occur across regions, as appendix Figure A5.1 shows: at the primary level, almost all the government schools in Addis Ababa operate multiple shifts, whereas among the other regions, the share ranges from no more than 60 percent in Harari and Tigray, to less than 10 percent in Benshangul-Gumuz. At the secondary level, the pattern shows a heavy, if not complete, reliance on multiple shifting in the largest as well as the most urbanized regions, no doubt reflecting the premium on space.

The fact that facilities are in short supply throughout the government system is also suggested by the high section sizes in both primary and secondary education. They average about 80 students per section at the secondary level (which is nearly 1.6 times the ratio in nongovernment schools) and 72 at the primary level. Within primary education, the very rapid expansion of enrollments in the lower grades has culminated in much higher section sizes in the first cycle than in the second. Behind these nationwide averages lies significant variation across schools: about a fifth of the sections in primary and secondary schools exceed 90 students, and some 6 percent at the primary level exceed 110 students (see Appendix Table A5.2). Regionally, section sizes also vary, and the disparities are much wider in the lower than upper grades. The average section size ranges from a low of 38 in Afar to a high of 84 in SNNPR for grades 1–4; from a low of 30 in Afar to a high of 67 in Addis Ababa in grades 5–8; and from a low of 55 in Gambella to a high of 88 in SNNPR in grades 9–12 (see Appendix Table A5.3).

Size Distribution of Schools. Because section sizes are so large, many of Ethiopia's government schools cater to relatively large numbers of students. On average, government schools at the secondary level have 1,800 students, while those at the primary level have some 670 students. Urban schools enroll, on average, more than twice the number of students as rural schools, and important variations are apparent across regions (Figure 5.2). Schools are largest in Addis Ababa, averaging more than 2,500 pupils at the primary level and more than 4,300 at the secondary level. At the other end of the spectrum are such regions as Afar, Benshangul-Gumuz, and Gambella, where primary schools enroll an average of between 200 and 380 pupils, and secondary schools, between 500 and 700 students. As discussed later in this chapter, the characteristic pattern of large section sizes and large schools in Ethiopia raises important questions about tradeoffs in service delivery, particularly between costs—both on the capital and recurrent side—and the accessibility of schooling, particularly in rural areas.

Aspects of the Learning Environment. To add to the above discussion, Table 5.6 provides information on a few additional indicators pertaining to the overall learning environment. Although sparse, the data suffice for a first look at this stage. In addition to being overcrowded, most government schools appear to be in poor physical condition. Barely more than a quarter of the government primary schools and only about a third of the government secondary schools are rated by school personnel as in good or excellent condition (not needing repairs or rehabilitation); the corresponding percentages are substantially higher, nearly two-thirds and nearly 92 percent, respectively, in the nongovernment sector. An interesting fact is that many of the schools have the facilities to implement radio-enhanced teaching, especially at the primary level. But the supply of textbooks appears to be poor: in Oromiya, for example, the ratio is fewer than two textbooks for each student for a curriculum that covers six subjects in grades 1–4 and 12 subjects in grades 5–8; the ratio is significantly better in secondary education, averaging 6.3 books per student.

Figure 5.2. Average Size of Enrollments in Government and Nongovernment Primary and Secondary Schools by Locality and Region, Ethiopia, 2001–02



Benshangul, Benshangul-Gumuz; SNNPR, Southern Nations and Nationalities Peoples Republic.

Note: Striped part of each bar refers to the size of government schools; solid part to the size of nongovernment schools; data for Somali not available.

Source: Analysis of Ministry of Education's 2001–02 Ethiopia school census data.

Staffing Patterns

The profile of staff in the education system and their deployment are important features of the arrangements for service delivery. Below we briefly review the information on school-level administrative staff before taking a more in-depth look at the data on teachers.

Administrative Staff

As documented in Chapter 3, administrative staff, especially at the school level, account for a relatively small share of government spending on education. This fact is corroborated by the data in Table 5.7 which show a relative scarcity of administrative staff in government schools. Only 19 percent of the government primary schools are assigned such staff,

Table 5.6. Selected Indicators of Conditions in Government and Nongovernment Primary and Secondary Schools, Ethiopia, 2001–02

Indicator	Primary schools: Government	Primary schools: Non-government	Secondary schools: Government	Secondary schools: Non-government
Percentage of schools in: good or excellent condition[a/]	26.1	63.2	33.2	91.8
Percentage of schools with functional radios	71.7	60.5	33.1	37.0
Percentage implementing self-contained classes, Amhara Region[b/]	49.9	14.4	n.a.	n.a.
Average number of textbooks per student, Oromiya Region[c/]	1.9	1.8	6.3	8.4

n.a. Not applicable.
a. According to self-reporting by the schools.
b. Refers to classes where the core subjects are taught by the same teacher. The figures are based on data for 5,421 government and 160 nongovernment primary schools.
c. The information for the other regions is incomplete.
Source: Analysis of the Ministry of Education's 2001–02 Ethiopia school census.

compared with nearly two-thirds in the nongovernment sector); and the staffing ratio for these schools is, on average, 736 administrative staff per pupil—5.7 times the ratio in the nongovernment sector. At the secondary level, the schools are better endowed: only 15 percent of the government schools report the absence of any administrative staff. Among the 85 percent of schools with administrative staff, the staffing ratio is nonetheless very high, averaging 295 staff per student, compared with the corresponding ratio of 45 in nongovernment schools. While it is not the purpose here to imply that poor staffing ratios are necessarily the most damaging constraint on service delivery, the scarcity of administrative staff

Table 5.7. Administrative Staff Allocation and Staffing Ratios across Primary and Secondary Schools, Ethiopia, 2001–02

Type of school	Level of instruction offered: Primary grades only	Secondary grades only	Secondary and primary grades	All levels
Government schools				
Percentage with administrative staff	19.3	84.8	76.9	19.7
Ratio of students to administrative staff[a/]	736	295	595	732
Nongovernment schools				
Percentage with administrative staff	65.7	100.0	97.3	67.7
Ratio of students to administrative staff[a/]	129	45	60	123

a. Among schools reporting presence of at least one administrative staff person.
Source: Analysis of the Ministry of Education's 2001–02 Ethiopia school census.

reflected in the data does imply that, in many schools, the support function that administrative staff typically provide is either left unfilled or performed by teachers—either in addition to their teaching duties or perhaps in place of them. Though data are unavailable to document this aspect of work allocation, it is clear that any diversion of teachers to administrative tasks at the cost of teaching would be inefficient, because teachers cost nearly twice as much as administrative staff (see Chapter 3).

Teachers

Teachers are the single most important item of public spending on education. They are the main resource that schools, particularly at the lower levels, have at their disposal to organize the delivery of education services, and they are the frontline workers with direct responsibility for managing teaching and learning processes in the classroom. The profiles of teachers, as well as their deployment in the system across schools, are thus highly pertinent aspects of the education system.

Composition by Gender and Qualification. Table 5.8 displays the relevant data for teachers in government and nongovernment schools, according to the classes they teach. Female teachers form around 30 percent of the teaching force at the primary level (with a slightly larger share in government than in nongovernment schools) and less than 10 percent at the secondary level (with a smaller share in government than in nongovernment schools). The preponderance of male teachers, particularly in secondary schools, is consistent with the fact that significantly fewer women than men reach the upper levels of the education system where future teachers obtain their qualification to teach in secondary schools (see Chapter 4). At the primary level, Ethiopia's share of female teachers is somewhat smaller than the average of 38 percent for the 19 other African countries whose data are included in Figure 5.3. The figure, which plots the female share of teachers against gender parity in grade 6 completion (as measured by the ratio between girls' completion rate and that of boys), reflects the expected positive impact of the presence of female teachers on girls' schooling. The cross-country data suggest that Ethiopia's gender disparity in grade 6 completion rates (the rate for girls is about 71 percent of boys') is entirely consistent with the current share of female teachers in the system.

Besides gender, teachers' academic credentials also matter: for educators, having sufficient numbers of appropriately certified teachers is part of what makes good teaching possible; for other policymakers, it raises important questions about costs and the fiscal sustainability of school expansion. The official policy currently sets the following standards for teacher recruitment: graduates of teaching training institutes (TTIs) are expected to teach in grades 1–4; those of teacher training colleges (TTCs), in grades 5–8; and university graduates, in grades 9–12. The extent to which these standards are met in practice can be discerned from the table above. In grades 1–4, more than 95 percent of the teachers in government schools are TTI-certified, implying that recruitment is nearly perfectly consistent with the government's policy. In nongovernment schools, the consistency with official policy is not as high: the share of TTI graduates is only 73 percent, while those with less than TTI certification account for nearly a fifth of the total, and those with TTC diplomas or other qualification make up less than a tenth.

Table 5.8. Distribution of Teachers by Gender and Qualification in Government and NonGovernment Primary and Secondary Schools, Ethiopia, 2001–02

Teaching assignment of teacher and type of school	Number of teachers	Percentage of female teachers	Percentage distribution of teachers according to their academic qualification: Grades 8 and below	Grades 9, 10, 11, & 12	TTI	TTC & diploma[a/]	BA & MA	Other[b/]	Total
Grades 1–4									
Government	74,408	40.4	0.4	2.7	91.6	4.3	0.0	1.0	100.0
Nongovernment	4,756	39.6	1.0	13.7	60.8	17.9	0.8	5.8	100.0
Grades 5–8									
Government	43,710	15.7	0.2	0.6	70.3	26.4	0.1	2.3	100.0
Nongovernment	4,008	15.5	0.1	3.4	31.7	54.3	2.7	7.8	100.0
Grades 1–8									
Government	118,118	31.3	0.3	1.9	83.7	12.5	0.1	1.5	100.0
Nongovernment	8,764	28.6	0.6	9.0	47.5	34.6	1.7	6.7	100.0
Grades 9–12									
Government	13,306	7.6	0.0	0.1	6.9	59.5	32.8	0.7	100.0
Nongovernment	785	11.0	0.0	0.0	1.8	46.9	49.6	1.8	100.0

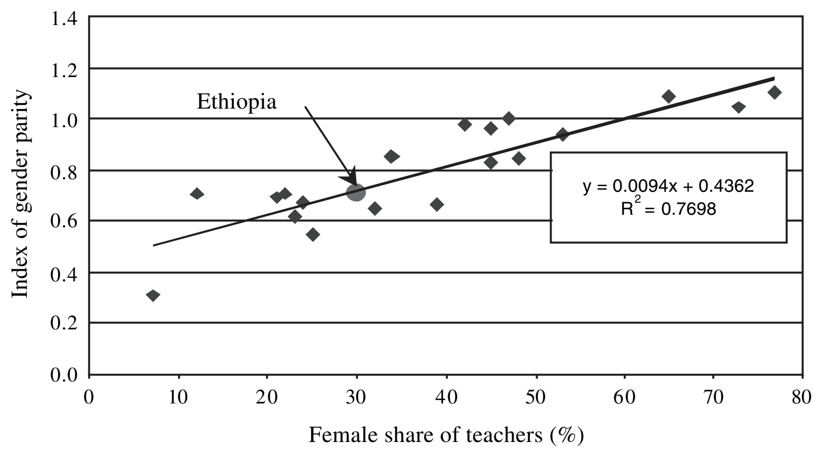
BA Bachelor's degree; MA master's degree; TTI teacher training institutes; TTC teacher training colleges.

a. Refers to diploma-level courses from other institutions of higher education; includes teachers with grade 12 and summer training or one to three years of unspecified training beyond grade 12.

b. Includes teachers qualified to teach physical education, technical and vocational courses, crafts, agriculture, music, art, or unspecified subjects.

Source: Computed from data in the Ministry of Education's Statistical Abstract for 2001–02.

Figure 5.3. Relation between Gender Parity in Grade 6 Completion and Female Share of Teachers in Primary Education, Ethiopia, 2001–02, and Other African Countries, circa 2000



Note: The index of gender parity is computed as the ratio between girls' and boys' grade 6 completion rates.

Source: For Ethiopia, tables 4.6 and 5.6; for all other countries, Kengne and Mingat 2002.

The picture changes dramatically in both grades 5–8 and grades 9–12. At these levels, the bulk of teachers have less than the officially specified certification. Only 26 percent of the government teachers assigned to grades 5–8 are TTC-certified, while 70 percent are TTI-certified. Among their counterparts in private schools, TTI-certified teachers also predominate, but to a smaller extent, and the difference is made up by larger shares of both less well-qualified and better-qualified staff. In other words, there is greater diversity in teacher qualification in the nongovernment sector. In grades 9–12, only about 33 percent of the teachers in government schools satisfy the official certification standard (i.e., a university degree), about 60 percent are TTC graduates, and nearly 7 percent are TTI graduates. The presence of TTI graduates obviously poses a problem since these teachers have only slightly more education than their own students and are thus probably underqualified for their job. In nongovernment schools, 50 percent of the teachers meet the official standards and the share of the least well-qualified (i.e., TTI graduates) falls to less than 2 percent. Taken as a whole, what these data emphasize is that while recruitment standards for grades 1–4 have been easily met, those for subsequent grades may be unrealistically demanding. Rationalizing the profile of the teaching force so that a sustainable balance is achieved among all cycles appears to be an important issue. Clearly, any change would require a better understanding of the reasons for the current mismatch between policy and reality, including the dynamics of the labor market for teachers.

Pupil-Teacher Ratios. This common indicator provides a useful measure of the availability of teachers in an education system. The data for Ethiopia, displayed in Table 5.9,

Table 5.9. Pupil-Teacher Ratios by Level of Instruction in Government and Nongovernment Schools across Regions, Ethiopia, 2001–02

	Government schools				Nongovernment schools			
Locality or region	Grades 1–4	Grades 5–8	Grades 1–8	Grades 9–12	Grades 1–4	Grades 5–8	Grades 1–8	Grades 9–12
Ethiopia	**75.2**	**48.8**	**65.3**	**51.5**	**48.3**	**35.1**	**42.2**	**20.0**
Rural	83.2	51.2	73.7	51.0	76.2	37.1	63.3	34.8
Urban	53.1	46.6	49.9	54.2	40.5	34.8	37.7	19.7
Tigray	70.3	69.2	70.0	89.1	44.4	37.8	42.3	27.3
Afar	32.5	28.1	31.2	54.8	33.2			
Amhara	75.6	58.4	70.2	44.1	51.9	43.0	48.5	32.8
Oromiya	79.2	45.9	66.4	46.7	57.4	31.8	47.2	28.0
Benshangul-Gumuz	46.4	78.2	52.4	23.6	51.8			
SNNPR	79.6	45.9	66.1	60.8	67.1	38.4	56.5	24.3
Gambella	40.2	34.7	38.4	39.0	54.7			
Harari	27.3	22.7	25.3	33.2	16.3	11.9	14.2	8.1
Addis Ababa	41.7	35.0	38.0	51.8	39.9	35.3	37.5	16.9
Dire Dawa	40.5	43.3	41.6	40.5	37.5	44.4	40.2	38.7

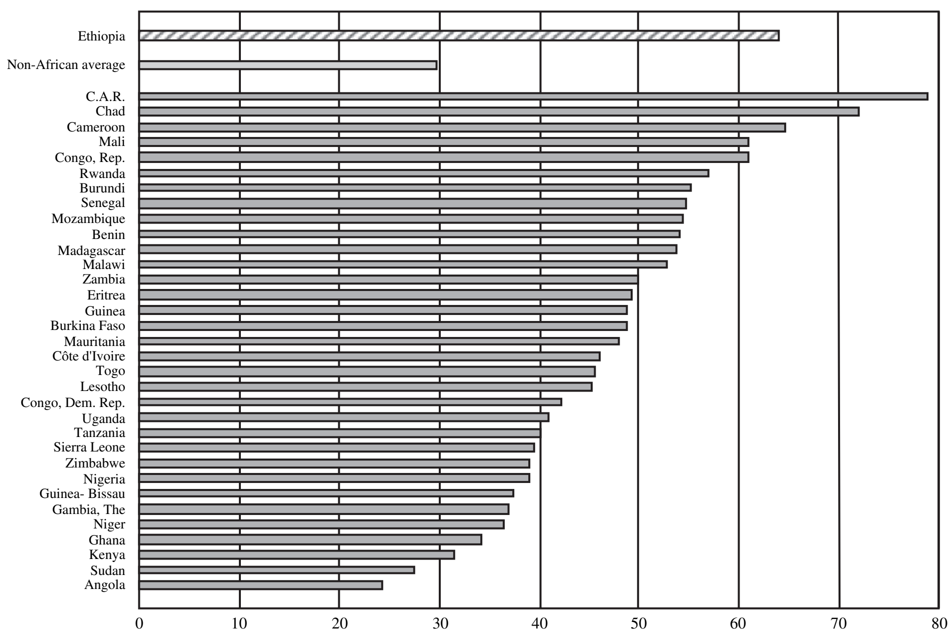
SNNPR, Southern Nations and Nationalities Peoples Republic.
Note: Data unavailable for Somali; Ratios are computed by dividing total enrollments by the total number of teachers; ratio for Ethiopia excludes data for Somali, Benshangul-Gumuz, and Gambella, to ensure consistency with data use in disaggregation exercise in Table 3.13.
Source: Analysis of the 2001–02 Ethiopia School Census.

show a high average for the system as a whole, as well as wide variation across sector, locality, levels of education, and region. In the government sector, a most unusual finding is that the pupil-teacher ratio in grades 1–4 among rural schools is 1.6 times as high it is for urban schools. In grades 5–8, rural schools still have higher ratios, but the gap is not as large; and in grades 9–12, the pattern is reversed, but barely so. More commonly, one would expect pupil-teacher ratios to be lower in rural areas throughout the system, mainly because population densities are lower. The fact that Ethiopia's pattern bucks this more common pattern is a measure of just how scarce teachers are. Pupil-Teacher ratios are much lower in nongovernment schools at all levels; an interesting fact, however, is that the ratios in rural schools also exceed those in urban areas, and this structure persists even in grades 9–12. Thus, it appears that teachers are also scarce in nongovernment schools serving rural populations.

Regionally, the differences are strikingly wide: the ratio of students to teachers ranges from 27.3 in Harari, to 79.6 in SNNPR in grades 1–4; from 22.7 in Harari, to 69.2 in Tigray in grades 5–8; and from 23.6 in Benshangul-Gumuz to 89.1 in Tigray in grades 9–12. The regional diversity is just as wide among nongovernment schools. The similarity of the patterns in the two sectors raises an interesting question: are nongovernment schools somehow constrained to operate in the same way as government schools? While we have no data in the context of the present study to answer this question, it nonetheless warrants attention if nongovernment schools are in future expected to play a larger role in meeting the demand for education, particularly at the postprimary levels.

Cross-country Comparisons of Pupil-Teacher Ratios. At an average of 65 pupils per teacher, Ethiopia's ratio for public primary education is among the highest in Africa (Figure 5.4). When ratios are very high, teachers are scarce and the result is to compromise the teaching and learning process: in Ethiopia they translate into large section sizes, as already documented; in other countries, they may mean shortened instructional time for pupils, as in Rwanda where teachers are assigned to teach two shifts of students. In is important to note that as in other countries, the overall scarcity of teachers in the Ethiopian system affects some schools more than others. Table 5.10 shows, for example, that about a fifth of the government schools had a pupil-teacher ratio no higher than 50:1 in grades 1–4, while nearly a quarter had a ratio of no less than 110:1. In the upper grades, the disparities in staffing are narrower but still large: in grades 5–8, for example, more than 8 percent of the

Figure 5.4. Primary School Pupil-Teacher Ratios in Ethiopia, 2001–02, and Other Countries, circa 2000



C.A.R. Central African Republic; Congo, Dem. Rep. Democratic Republic of the Congo; Congo, Rep. Republic of Congo.

Note: Ethiopia's ratio refers to the weighted average for the country's eight-year cycle, while those for the other countries typically refer to primary cycles that last five or six years. The non-African average refers to the data for 21 countries that in 2002 have yet to achieve universal primacy school completion, and whose data are included in the source cited below.

Source: Ethiopia, Ministry of Education's Statistical Abstract for 2001–02; other countries, Bruns, Mingat, and Rakotomalala 2003.

Table 5.10. Percentage Distribution of Government and Nongovernment Schools by Range of Pupil-Teacher ratios, Ethiopia, 2001–02

	Government schools			Non-Government schools		
Range of pupil-teacher ratio	Grades 1–4	Grades 5–8	Grades 9–12	Grades 1–4	Grades 5–8	Grades 9–12
<30	5.8	23.6	16.0	24.3	47.1	75.5
30–50	14.7	33.4	36.2	30.6	33.0	22.6
50–70	21.7	23.5	28.2	19.3	14.2	1.9
70–90	21.5	11.1	11.2	11.7	3.2	0.0
90–110	13.5	4.1	4.3	5.6	0.9	0.0
>110	22.8	4.3	4.3	8.6	1.6	0.0
Total	100%	100%	100%	100%	100%	100%
Memoranda:						
Sample size	11,022	5,939	376	592	437	53
Pupil-Teacher ratios						
Unweighted mean[a/]	89.0	52.2	57.0	57.3	36.2	21.7
Weighted mean[b/]	75.2	48.8	51.5	48.3	35.1	20.0
Median[c/]	76.6	45.8	49.0	45.8	31.2	20.2
Standard deviation	60.9	38.6	56.7	48.5	30.2	13.0

a. Refers to the average of the pupil-teacher ratios across schools, computed by first calculating the ratios for each sample school, and then taking the average of these ratios.
b. Refers to the ratio obtained by dividing total number of students by the total number of teachers. For government schools, data excludes Somali, Benshangul-Gumuz, and Gambella.
c. Refers to the ratio that divides the sample into two equal groups, one with ratios exceeding it and the other with ratios smaller than it.
Source: Analysis of the Ministry of Education's 2001–02 Ethiopia School Census.

schools make do with ratios above 90 pupils per teacher, while nearly 24 percent enjoy ratios below 30:1. Staffing ratios in nongovernment schools are generally more favorable and the disparities across schools, while still significant (especially in the first cycle), are less extreme when compared with the distribution among the government schools.

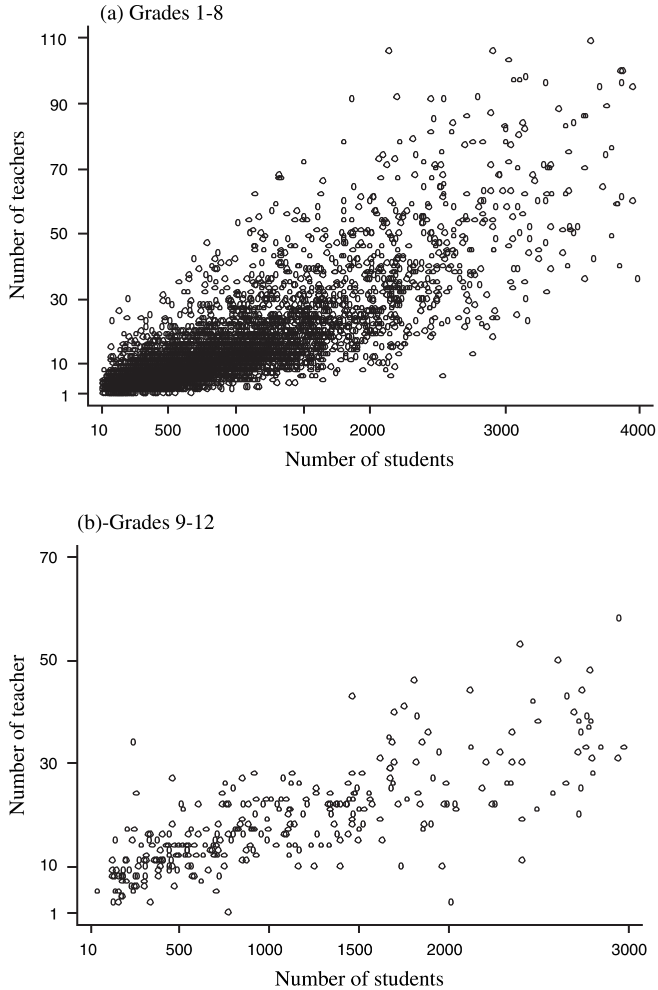
Teacher Allocation across Government Schools

In this section, we take the foregoing analysis a step further by examining the pattern of teacher allocation across schools. The presentation is limited to the government sector, in part to simplify the presentation, but, more important, to focus attention on issues in system management that the government might address.

Relation Between Enrollments and Teacher Allocation Across Schools. The relevant data are displayed in Figure 5.5, which plots the size of a school against the number of teachers it has.[96]

96. For similar graphs showing the data separately for grades 1–4 and grades 5–8, see appendix Figure A5.2.

Figure 5.5. Relation between Numbers of Students and Teachers across Government Primary and Secondary Schools, Ethiopia, 2001–02



Note: For separate figures for grades 1–4 and grades 5–8, see appendix Figure A5.2.

Source: Analysis of the Ministry of Education's 2001–02 Ethiopia school census.

The left panel in the figure pertains to primary schools, and the right panel, to secondary schools; in both panels, the horizontal axis shows a school's enrollment while the vertical axis, the number of teachers assigned to the school.[97] Across both primary and secondary schools, the data suggest that school size relates positively, as it should, to the number of teachers; yet at the same time, this positive relationship is not particularly precise: among secondary schools, for example, a school with, say, 1,000 students, may have as few as 10 teachers or as

97. Data from Oromiya Region indicate the presence of a very small number of teachers (about 0.3 percent of the total) who are paid by the community. These teachers are not counted in the data for most regions, and are thus excluded from the analysis here.

many as 25. The loose relationship between school size and teacher allocation is a corollary of the wide disparities in the pupil-teacher ratio already documented above.

Regression Analysis of Teacher Allocation Across Schools. We turn to regression analysis to achieve a more systematic assessment of the relation between school size and number of teachers. The results of such analysis based on data for government schools are summarized in Table 5.11 and suggest three main observations. First, the coefficient estimates on the number of students indicate that, on average, a new teacher is added for every 111 students in grades 9–12, compared with the corresponding figures of 83 students in grades 1–4 and 56 pupils in grades 5–8.[98] Teachers are scarce throughout the education system, but especially in the first cycle of primary education and in secondary education. These allocation patterns, particularly in secondary education where the curriculum requires specialized teaching, imply that schools must enroll large numbers of students in order to keep the student-teacher ratio in check.

Table 5.11. Regression Estimates of the Relation between Numbers of Teachers and Students across Government Schools by Level of Instruction, Ethiopia, 2001–02

Item	Grades 1–4	Grades 5–8	Grades 1–8	Grades 9–12
Number of students	0.012	0.018	0.016	0.009
	(91.58)**	(132.49)**	(164.73)**	(26.86)**
Constant	15.78	15.417	26.244	9.428
	(31.22)**	(30.36)**	(35.88)**	(3.96)**
No. of observations[a/]	11,022	5,939	11,122	372
R^2	0.50	0.79	0.76	0.75
Memorandum:				
R^2 for regression without regional dummies	0.44	0.75	0.72	0.70

Note: Regression equation includes regional dummy variables, not shown here to economize on space. Value of t-statistics appear in parentheses; two stars (**) denote statistical significance at the 1 percent confidence level. Results for nongovernment schools are shown in Appendix Table A5.1.
a. Refers to the number of schools offering the indicated level of instruction; for the purpose of the regression, the number of teachers includes all who teach at the indicated level, whether or not they have classes at the other levels.
Source: Analysis of the Ethiopia 2001–02 School Census; see Table A5.4 for full regression results.

The other two observations center around the values of the R^2 statistic. This statistic is a measure of how well the estimated regression equation accounts for the disparities in teacher allocation across schools. In a system where teachers (or fractions of their time) are allocated to schools strictly on the basis of enrollments, the R^2 statistic would have a value of 1.0. Conversely, the further the R^2 value is from 1.0, the more factors other than school size intervene in the allocation of teachers across schools. Table 5.11 reports the R^2 values

98. These figures are computed by taking the inverse of the coefficient estimates on "number of students" in the regression equations reported in the table.

for two sets of regressions corresponding to specifications with and without dummy variables for regions. The fact that the R^2 variables are highly comparable between the two specifications implies that subregional processes play an important role in the placement of teachers. This result is consistent with those from similar analyses in other countries. It reflects the reality that while teacher allocation rules may exist, the outcomes are decided at the local level by officials who ultimately implement the rules in response to the pressures and priorities they feel and perceive.

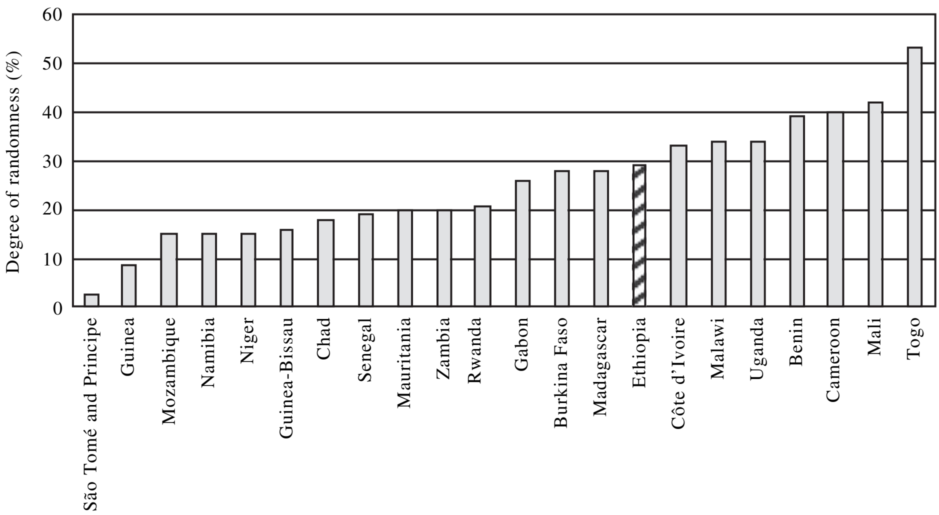
The third observation is that the R^2 values for the regressions for grades 1–4 are significantly smaller than for grades 5–8 or grades 9–12, which implies greater randomness in teacher allocation at that level. One possible explanation may be the fact that some primary schools—58 percent, to be precise—combine both subcycles of primary schooling under one roof. In such schools, decisions about teaching assignment between the two subcycles are activated at the school level; it is possible that the staffing requirements in grades 5–8 are prioritized, perhaps to facilitate implementation of a curriculum that requires specialized teaching. If so, the number of teachers for grades 1–4 would simply be a residual complement, after the requirements in grades 5–8 have more or less been met.

Cross-country and Regional Comparisons. Whatever the underlying processes, the fact is that staffing ratios are highly disparate across schools in grades 1–4. While the situation is better at the other levels, room for improvement probably exists throughout the system. This possibility becomes clear in light of cross-country experience, as illustrated in Figure 5.6. In the figure, countries are ranked in order of the degree of randomness in teacher allocation across public sector primary schools, as measured by how far the R^2 values for each country's regression fall short of unity. Ethiopia's randomness index for grades 1–8 is moderately high by African standards, but its index for grades 1–4 exceeds that of all the countries in the figure. It is noteworthy that in such countries as Burkina Faso, Madagascar, Mauritania, Mozambique, and Niger (countries where the degree of randomness is smaller than in Ethiopia) efforts are already under way to reduce inconsistency in teacher allocation as a priority for sector development.

Regression analysis also provides a simple means for regional comparisons of the consistency of teacher allocation across schools. As before, the method involves estimating for each region the relation between enrollments and number of teachers; and computing the index of randomness by subtracting from unity the R^2 value of the regression estimates, and expressing the result in percentage terms.[99] Figure 5.7 below summarizes the results for grades 1–8 and grades 1–4. Performance is starkly different across regions: among the four largest regions, the index of randomness for grades 1–8 varies from just 8 percent in Tigray, to 41 percent in SNNPR; Amhara and Oromiya are ranked in between and have an index of 22 and 28 percent, respectively. The range is as wide as what is observed internationally; the outcome in Tigray is comparable with the best-performing countries, which suggests the practices in this region might hold lessons for other regions on ways to manage the deployment of teachers. Among the remaining regions, the networks of schools are relatively small (for example, Harari and Dire Dawa have fewer than 45 schools each), and one would expect greater consistency in the relation between school size and number of teachers.

99. See Appendix Table A5.4 for the full regression results.

Figure 5.6. Randomness in Teacher Deployment Across Schools in Ethiopia, 2001–02, and Other African Countries, circa 2000



Note: The degree of randomness is computed as 1 minus the R^2 value of regression equations relating number of teachers assigned to teach the indicated grades to number of pupils in those grades, schools being the unit of observation. The index has a 0–1 range; higher values indicate greater inconsistency in the deployment of teachers across schools. Data refer to government schools in all countries.

Source: Analysis of each country's school census data.

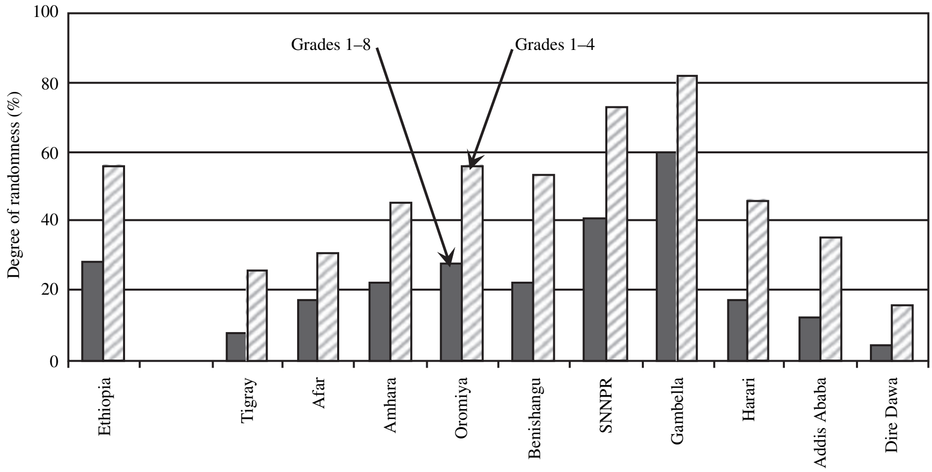
While this expectation is borne out in most regions, the degree of randomness in teacher allocation is relatively high in Harari, Afar, and Benshangul-Gumuz, and exceptionally so in Gambella. Finally, the figure shows that in all regions, substantially more randomness exists in teacher allocation in the first four grades of primary schooling than in whole cycle. Even in Tigray, 26 percent of the variation in teacher allocation is accounted for by factors other than the size of enrollments. Taken as a whole, the regional results confirm that the management of teacher deployment is generally weak not only across schools, but also between the two cycles of primary schooling within schools.

Economies of Scale in Service Delivery

In this section we consider how costs relate to the size of enrollments. Before starting, we note that in Ethiopia, the school census contains information on the number of administrative staff and teachers, along with their distribution by salary range, as well as reported spending on nonsalary school inputs. We combine this information to compute the cost per student and plot the result against the size of the school (Figure 5.8).[100] The relation

100. Because salaries are related to these variables, the costs thus computed capture information not only on the number of staff, but also their qualification and experience.

Figure 5.7. Randomness in Teacher Deployment across Government Primary Schools by Region, Ethiopia, 2001–02



Benshangul, Benshangul-Gumuz; SNNPR, Southern Nations and Nationalities Peoples Republic.

Note: The degree of randomness is computed as 1 minus the R^2 value of regression equations relating number of teachers assigned to teach the indicated grades to number of pupils in those grades, schools being the unit of observation. The index has a 0–1 range; higher values indicate greater inconsistency in the deployment of teachers across schools.

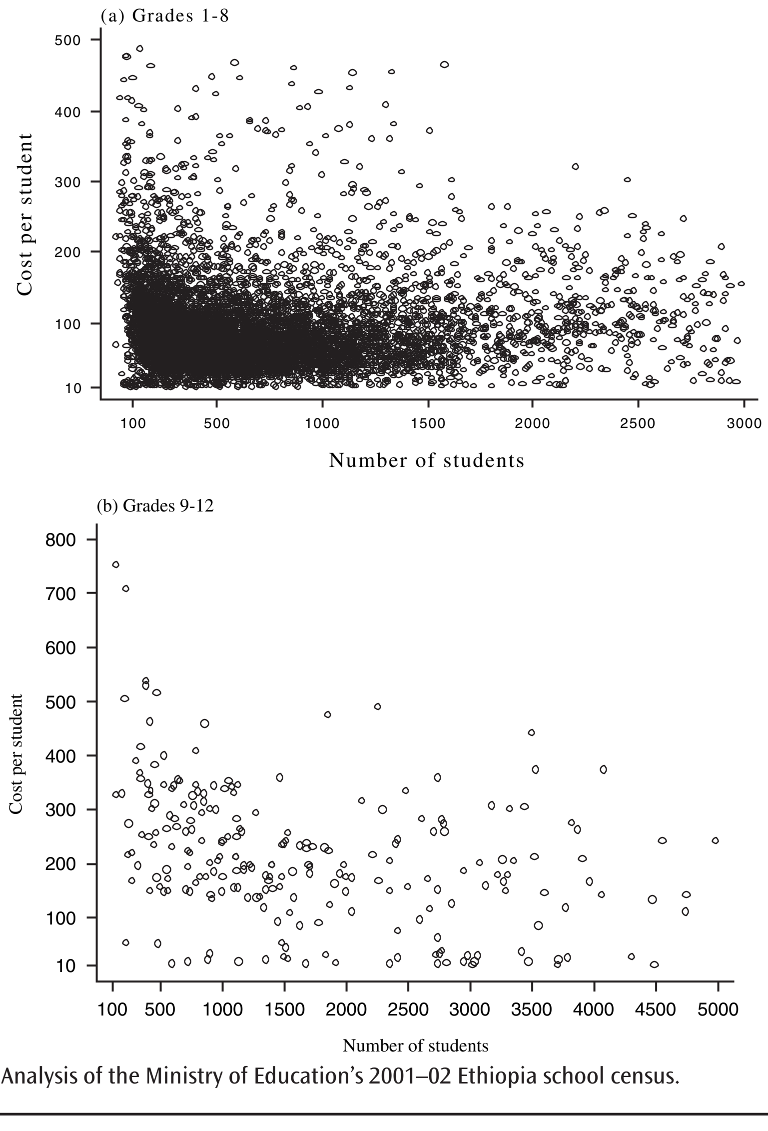
Source: Analysis of the Ministry of Education's 2001–02 school census; see also appendix table A5.5.

shows the characteristic disparities across schools, which are unsurprising given the large gaps across schools in teacher allocation that we have just documented.

Regression Analysis. As before, we use regression analysis to provide a systematic evaluation of the relation between size of enrollments and total spending across schools. The results appear in Table 5.12. The fact that the R^2 values in these regressions are smaller than the corresponding R^2 values in the regressions in the previous section (involving number of teachers and school size) implies that the disparities across schools in overall recurrent costs are even less well explained by school size alone.

Our focus here, however, is on the coefficient estimate of the school size variable. In the regressions, both the dependent variable (total recurrent costs) and the size of school (enrollments) are expressed in logarithmic terms. The coefficient estimate on the school size variable is thus interpreted as the percentage increase in cost for a given percentage increase in enrollments; the inverse of this coefficient is a measure of the magnitude of the economies of scale in providing services. Because of the way services are currently organized, there are few economies of scale in primary education: a 1 percent increase in total spending allows only a proportionate increase in enrollments; by contrast, the economies of scale are substantially higher in secondary education: a 1 percent increase in total resources allows a doubling of enrollments. This result is consistent with the fact that secondary schools have more administrative staff and specialized teachers whose time can be fully utilized only in larger schools.

Figure 5.8. Relation between Cost Per Student and Size of Enrollments across Government Schools, Ethiopia, 2001–02



Source: Analysis of the Ministry of Education's 2001–02 Ethiopia school census.

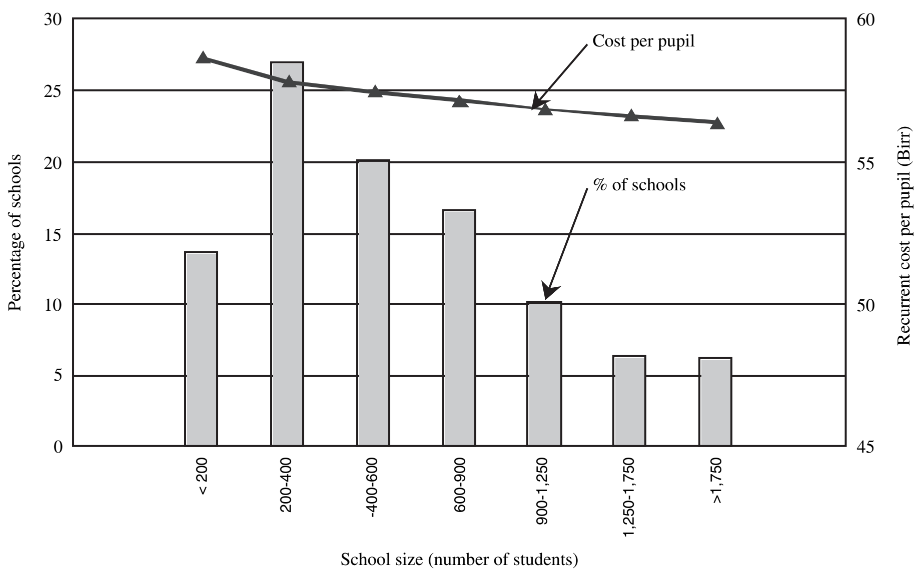
Economies of Scale and the Size Distribution of Schools. The foregoing analysis provides a lens through which to view the size distribution in the current network of government schools. Figure 5.9 below shows the distribution of the primary schools and the unit costs for given school sizes simulated from the regression equations. The absence of economies of scale at this level of education is reflected in the relatively flat cost curve. Yet, some 23 percent of the schools enroll more than 900 pupils, and about 12 percent, more than 1,250 pupils. The presence of these relatively large schools suggests that factors other than recurrent cost considerations have also been influencing school size. In Ethiopia, one such factor is the high

Table 5.12. Regression Estimates of the Relation between Total Costs and Enrollments across Government Schools, Ethiopia, 2001–02

Item	Primary schools (grades 1–8)	Secondary schools (grades 9–12)
Ln (Number of pupils)	0.987	0.511
	(66.91)**	(5.99)**
Constant	4.131	8.439
	(44.49)**	(13.53)**
Number of observations	9,608	264
R^2	0.32	0.12
Memorandum:		
Economies of scale[a/]	1.01	1.96

Note: The dependent variable, total recurrent costs, is expressed on a logarithm scale; values of t-statistics are shown in parentheses, two stars (**) denoting statistical significance at the 1 percent confidence level. Schools offering mixed primary and secondary cycles are excluded from the sample. Total costs include the salaries of teachers and administrative staff, operating expenses, and spending on educational supplies.
a. Refers to the percentage increase in pupils enrolled for a 1 percent increase in total costs; computed as the inverse of the coefficient on the ln (number of pupils) variable.
Source: Analysis of the Ministry of Education's 2001–02 Ethiopia school census.

Figure 5.9. Size Distribution of Government Primary Schools and Recurrent Cost Per Pupil by School Size, Ethiopia, 2001–02

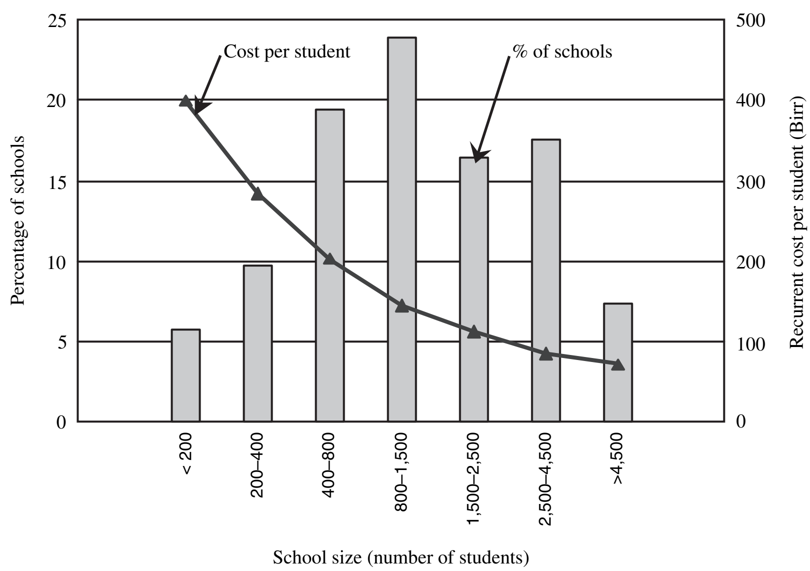


Source: Size distribution based on analysis of Ministry of Education's 2001–02 school census; cost per pupil simulated from regression equation reported in table 5.12

cost of school construction. Under the Education Sector Development Program (ESDP), construction was budgeted at $20,000 per furnished and equipped classroom (allowing for peripheral facilities); to put this cost in perspective, recall that it is equivalent to 25 times the average salary of primary school teachers. A recent study estimates that a four-classroom school could be built for between 150,000 and 200,000 Birr, depending on choice of materials and design, for a per-classroom construction cost of between $4,400 and $5,900 (McArthur 2003). Another study that collected costs from several sites based on interviews with experts and on tender documents puts the range at between $7,000 and $19,000, depending on location (Coyle 2003); the study also suggests that alternative building designs and materials could potentially lower these costs by about a third.[101] The prospect of taking advantage of economies of scale in service delivery will depend greatly on how well capital costs are managed. If costs persist at $20,000 per classroom, large schools are inevitable; by the same token, fewer schools would be built; this would compromise the accessibility of schools, particularly in rural areas where most of the expansion of the system must take place.

For secondary education, the data on recurrent cost and size distribution of schools are summarized in Figure 5.10 below. The cost simulation shows the expected decline in recurrent cost per student as enrollments rise: it falls from 400 Birr per student in schools with fewer than 200 students, to just above 100 Birr in schools with enrollments of 1,500

Figure 5.10. Size Distribution of Government Secondary Schools and Recurrent Cost Per Student by Size of School, Ethiopia, 2001–02



Source: Size distribution of schools based on analysis of the Ministry of Education's 2001–02 school census; unit cost simulated from regression estimate reported in table 5.12.

101. See Appendix Table A5.6 for details.

to 2,500 students; indeed, beyond 1,500 students, the decline in costs becomes increasingly small as economies of scale are exhausted. As in primary education, the size distribution of secondary schools does not appear to be fully coherent with the pattern of scale economies. About 15 percent of the schools enroll too few students and are three to four times as costly per student as the larger schools. At the same time, a sizable share of the schools appear to be much larger than they need be to benefit from economies of scale: more than 40 percent have more than 1,500 students, and nearly 25 percent have more than 2,500. As in primary education, the high cost of school construction may be driving the system toward the larger schools. The Education Sector Development Program, for example, budgets construction of secondary schools at $30,000 per furnished and equipped classroom. Equivalent to about 23 times the average salary of a secondary school teacher, this cost is clearly on the high side and creates inevitable pressures toward large schools.[102]

Student Achievement

In any discussion of service delivery, learning outcomes are just as important to consider as costs. For this reason, we assemble below the available data on student learning and attempt to piece together a picture of the system's performance in this regard. To forewarn the reader, we must note that the data for Ethiopia are sparse and the little that exist are fragmentary and not readily accessible in formats conducive to detailed analysis. Because Ethiopia does not participate as yet in any of the growing number of international or regional studies on student learning, we cannot put the system's performance in a cross-country context, as we did for various aspects of service delivery discussed in earlier sections.[103] Nonetheless, the available data capturing experience within the country does help to raise important issues for policy development, even if they cannot provide definitive answers at this point. The sections that follow provide an overview of national examination results, a summary of two recent studies on student achievement, and an analysis of student learning in Oromiya prepared specially for this study.

Overview of Performance on National Examinations

National examinations at grades 8 and 12 date back to the days of Emperor Haile Selassie.[104] The grade 8 examinations were regionalized in 1999 but the results continue to be used for selection to grade 9. The examinations at grade 12 were replaced in 2003 by the College

102. Another way to evaluate these costs is to assess how the amortized cost per student relates to the recurrent cost per student. Assuming that classrooms accommodate 180 students each (e.g., two shifts of 90 students each), that they have a useful lifespan of 40 years, and that the interest rate averages 3 percent a year, the amortized capital cost would be 57.7 Birr per student, which is about 35 percent as high as the average recurrent cost per student.

103. Examples of regional studies that collect information on student learning include the following: UNESCO's Monitoring Learning Achievement (MLA) project; the Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ), Programme d'Analayse des Systèmes Educatifs de la CONFEMEN (PASEC), Trends in Mathematics and Science Study (TIMSS); Progress in International Reading Literacy Study (PIRLS), etc.

104. Examinations at grade 6 were also administered in the past when the system had a 6-4-4 structure.

Entrance Examination as the mechanism for selection into postsecondary education. National examinations at grade 10 are a recent mechanism, introduced in 2000 to manage access into grade 11.

Table 5.13 shows pass rates on the various examinations.[105] In grade 8, the passing mark in 1999–2000, the last year for which the examinations were administered nationally, was set at 32.6 percent, and on this basis, 66.9 percent of the nearly 270,000 who took the exam passed; this implies a pool of some 180,000 students who were qualified to enter grade 9. In grades 10 and 12, the passing grade is set at a grade-point average of 2.0. Among the large regions, pass rates for all three examinations are consistently high in Tigray, Amhara, and Oromiya, while they lag behind noticeably in SNNPR.[106] Pass rates are also high in Afar, but the region typically fields very few candidates. In the remaining regions, pass rates are low for Gambella at the grade 8 examination (57 percent as high as the national average); for

Table 5.13. Pass Rates on National Examinations at Grades 8, 10, and 12 by Region and Sex, Ethiopia, circa 2000

Country/region (Males=1.00)	Grade 8, 1999–2000[a]	Grade 10, 2001–02[b]	Grade 12, 2001–02[b]		
			Overall	Males	Females
Ethiopia	66.9	58.5	54.1	63.1	0.63
By region[c]					
Tigray	0.96	1.12	1.33	83.8	0.73
Afar	1.12	1.29	1.45	91.6	0.94
Amhara	1.20	1.09	1.16	73.4	0.64
Oromiya	1.17	1.16	1.13	71.5	0.67
Somali	0.91	0.76	1.04	65.4	0.96
Benshangul-Gumuz	0.88	1.16	0.98	61.8	0.69
SNNPR	0.69	0.82	0.86	54.1	0.39
Gambella	0.57	0.80	0.80	50.3	0.69
Harari	0.91	0.98	0.32	20.5	0.64
Addis Ababa	0.93	0.61	0.76	48.2	0.55
Dire Dawa	0.78	1.01	0.97	61.2	0.54
Memorandum:					
No. taking exam	267,642	156,970	182,903	112,561	38.5%

SNNPR, Southern Nations and Nationalities Peoples Republic.
Note: A breakdown by sex is available only for grade 12 results.
a. National examinations replaced by regional examinations after 1999–2000; pass rates refer to the percentage of students who scored at or above the passing mark of 32.6 percent.
b. Refers to the percentage of students who obtained a grade-point average of 2.0 or higher.
c. Indexed to national average.
Source: Personal communication from the National Examination Organization.

105. Although trend data are available on pass rates, their interpretation is unclear since the thresholds that determine pass rates vary from year to year, and in some years they also vary across regions. For the years shown in the table, the passing mark is the same across all regions.

106. See Appendix Table A5.7 for data on the number of candidates fielded by each region at the various examinations.

Addis Ababa at the grade 10 examination (61 percent as high as the national average); and for Harari at the grade 12 examination (32 percent as high as the national average). For the grade 12 examination, pass rates are available separately for boys and girls, and they show that girls are only 63 percent as likely as boys to pass. In all regions, girls lag behind boys, but the gender gap is widest in SNNPR.

Results of Two Recent Assessments of Student Achievement

Two studies hold particular interest in the context of this study.[107] The first is the Ethiopia National Baseline Assessments of Grade 4 and Grade 8 Student Achievement completed in 2001 by the National Organization of Examinations; the second is an evaluation of the costs and performance of alternative routes to basic education, completed by the Ministry of Education in 2000. Below we briefly summarize the results, focusing on aspects that are particularly pertinent to the relation between inputs or costs and learning outcomes.

National Baseline Assessments of Grade 4 and Grade 8 Student Achievement.[108] This nationwide study collected information in 2000 by testing more than 10,500 grade 4 students randomly sampled from the relevant sections in 256 government schools (which were themselves randomly selected from each region), and more than 5,500 grade 8 students sampled from the relevant sections in 136 government schools; in addition, questionnaires were administered to the school directors and the more than 750 grade 4 teachers and nearly 470 grade 8 teachers associated with the sample classes. The tests were carefully designed to gauge grade 4 student achievement in reading (in the language of instruction), English, mathematics, and environmental science; and grade 8 student achievement in English, mathematics, chemistry, and biology. They yield the following results, which provide a baseline for monitoring future trends in student achievement: the overall percentage of correct answers for the four subjects averaged 48 percent in the grade 4 sample, and 41 percent in the grade 8 sample; in both samples, girls scored somewhat lower than boys. As the test items were chosen from a range of key topics in the curriculum for the grade tested as well as that for the previous grade, these scores indicate that a large number of students were not achieving the curriculum objectives.[109]

The studies also evaluated the correlates of student achievement, focusing on such factors as: school infrastructure; school organization and management practices; teacher characteristics and practices; and the availability of instructional materials and equipment. In grade 4, the study stressed the positive contribution of the availability of textbooks (as well as teacher guides) and frequent use of the radio for supplementary instruction. However, it showed that introducing instruction in local languages appears to have compromised student learning, and that teaching in the local languages would require better support and training in order to close the performance gap. Especially interesting is the study's

107. Both studies were conducted in association with the Project Basic Education System Overhaul (BESO) funded by the United States Agency for International Development (USAID).

108. For details of the study and the results, see Kedir, Zewdie, and Afework (2000); see Appendix Table A5.8 for further details.

109. Many of the teachers in the study felt that the curriculum was too difficult. Nonetheless, it is interesting that in the schools where teachers tend toward this view, test scores were higher.

finding on the importance of such process variables as how well teachers prepare their lessons and how much the director focuses on school matters. In grade 8, the study again confirmed the positive influence of textbooks and instructional radio on student achievement and urged that investments in these areas be prioritized. Similarly, process variables also matter, including whether or not the school director tends to focus on school matters, and the extent to which students engage in homework. An important fact is that the study shows student achievement is not affected by the percentage of teachers who graduated from teacher training colleges or higher levels of training.[110] To summarize, the results from the baseline assessment are consistent with a large literature that consistently points to the cost-effectiveness of textbooks and other learning materials as well as that of instructional radio (e.g., ADEA 2003). The findings on process variables are also similar to those in other studies; the real issue here is to discover the underlying support and incentive structures that motivate teachers and school directors to adopt the desirable behaviors.

Student Achievement in and Costs of Alternative Basic Education. As noted in Chapter 2, some 500,000 pupils in Ethiopia are estimated to be attending alternative basic education centers that provide the equivalent of the first four grades of primary schooling.[111] In 2000, the Ministry of Education conducted a small study to evaluate whether the alternative routes "provide promise in terms of enhancing access while realizing at least equivalent levels of quality and efficiency as government schools."[112] The study documented the practices in 11 centers run by various nongovernment organizations (one of them in collaboration with the local government), and administered achievement tests to pupils in grades 2 and 3 in seven of the centers as well as to counterpart pupils in nearby government schools[113] Because the study's research design did not involve random sampling and the samples of centers and pupils were very small, its findings must obviously be treated with great care.[114] Nevertheless, the results raise questions that are highly relevant to discussions about educational access and performance—even if the picture they paint may require additional research to confirm them. The study finds that grade 1 dropout rates at the centers are only a third as high as in the nearby government schools and that most pupils persist to the end of the cycle; some even transfer to government schools for continuation in grade 5. Further, pupils in the centers tested reasonably well relative to their government school counterparts, obtaining overall scores on the four subjects, scores that were on average higher by 18 percent in grade 2 and only 7 percent lower in grade 4.[115]

110. As noted elsewhere, in grades 5–8, only about 26 percent of government teachers are certified as graduates of teacher training colleges (TTCs); in grades 1–4, more than 95 percent of the government teachers meet the requirement of being certified as graduates of teacher training institutes (TTIs). Because of the overwhelming share of TTI-certified teachers in grades 1–4, the impact of teacher certification at this level was not evaluated.

111. The curricula in the nonformal centers are typically designed to cover in three years the content of what is taught in four years in the government schools. In some of these centers, preschool is offered, so the number of years of schooling may in fact be equivalent between the two systems.

112. See Govt. of Ethiopia (2001).

113. The test instruments covered comprehension in four local languages, English, mathematics, and environmental science, and were prepared by experts from the National Organization of Examinations and the Regional Curriculum Development and Research Departments in the participating regions.

114. The achievement tests were administered to a total of 387 grades 2 and 3 pupils in the centers and to a total of 449 counterpart pupils in grades 2 and 4 in nearby government schools.

115. Gaps are computed from Table 4.6A in Govt. of Ethiopia (2001) and differs slightly from percentages reported in the text.

On the cost side, the basic education centers involve much lower capital and recurrent costs. At the time of the study, the cost of constructing a standard first-cycle government school (four classrooms, a pedagogical center, and a staff room), using standard materials (hollow blocks, concrete, or stone), ranged from 400,000 Birr in reasonably accessible areas, to three times as much in the more remote sites. By contrast, basic education centers comprising the typical two to four classrooms built with local materials, and with active community contribution of labor and some materials, may cost as little as 8,000 to 46,000 Birr; when the construction uses hollow blocks, the costs only double. For even the most expensive alternative basic education centers, the construction costs rise to no more than one-sixth the cost of a standard government school. Regarding recurrent costs, alternative basic education centers typically hire teachers who may be 10th or 12th grade completers without formal teacher training certification, and pay them perhaps no more than half the salaries received by TTI-certified teachers in government schools. By economizing on teacher costs, the centers not only are able to operate with much lower pupil-teacher ratios than those in government schools, but can also spend more on pedagogical inputs, all the while keeping cost per pupil about comparable to that in regular government schools. The mix of inputs is more adapted to rural populations, and possibly more effective pedagogically.

Thus the economics of alternative basic education centers appear attractive. However, the study did note that because these centers operate on a small scale, they may not be easily replicated to meet the country's vast needs in basic education. Even so, the centers provide cost and performance benchmarks that are useful in assessing options for expanding educational opportunities in rural areas; and the innovative aspects of their operations may contain ideas for improving service delivery in government schools. An important fact is that teachers are recruited locally and paid at a rate consistent with local labor market conditions—although the payment is modest relative to the pay scale for government teachers, it is sufficient to motivate and retain the teachers. Just as important, the teachers invariably receive initial training and regular followup training, and they benefit from continual support during the school year. Finally, a high level of community engagement exists: through participation in construction activities, through involvement in decisions about the school calendar and daily schedule of classes, and through on-site supervision of attendance by teachers and pupils. It may be noted that in one form or another, these beneficial aspects of the basic education centers in Ethiopia are in evidence in many other countries that have sought to bring services to rural populations.[116]

Additional Results Based on Grade 8 Examination Performance in Oromiya

To complement the foregoing studies, we compiled a special dataset in the context of the present study to examine more closely the relation between spending and learning outcomes, as well as the role of teacher certification. The dataset pertains to a stratified random sample of 314 schools in Oromiya chosen from the 1,037 schools in the region that enrolled

116. A few of these are described in the study, including the Bangladesh Rural Advancement Committee (BRAC) schools in Bangladesh; the *Escuela Nueva* schools in Colombia and Guatemala; Instructional Management by Parents, Communities and Teachers (IMPACT) schools in the Philippines and Indonesia, Malaysia, Jamaica, Liberia, and Bangladesh; and the community schools in Egypt.

pupils in grade 8. Data from the 2001–02 school census on the basic profile of these schools were merged with information for the same year on grade 8 regional examination results for individual students in the schools; they were also merged with information on the teachers who taught at the schools. As with the data used in the studies described earlier, the Oromiya dataset has its flaws. The fact that it was pieced together from existing data rather than created from scratch means that not all the information desired in an evaluation of the determinants of student learning were available.[117] The results reported below should thus be treated with caution and used simply to stimulate a healthy debate regarding the transformation of resources into learning outcomes in Ethiopian schools.

Overview of Examination Scores. Table 5.14 summarizes the data on grade 8 examination results, the proxy for learning outcome in the analysis here. Some of the sample schools serve as examination centers for evening and private students, but such students were relatively few in number and were excluded from the main analysis.[118] The overall score averaged only 33 percent for the eight subjects included in the examination, and the score was somewhat higher among boys than girls. More than three-quarters of those taking exams passed the examination—the passing mark is typically calibrated to generate a pool of qualified students for entry to grade 9 that more or less matches the number of places available in the system.

Table 5.14. Grade 8 Examination Results for a Sample of Pupils in Government Primary Schools in Oromiya Region, Ethiopia, 2001–02

Result	Evening student	Private student	Regular student	All
Average score[a/]	**25.3**	**26.8**	**33.0**	**32.8**
Girls	23.9	26.9	31.0	30.9
Boys	26.0	26.6	34.1	33.9
Pass rate	**38.3**	**36.3**	**83.0**	**81.9**
Girls	26.2	34.7	75.3	74.1
Boys	44.9	37.7	87.4	86.4
Memorandum:				
No. of observations	551	201	30,393	31,145
Girls	195	95	10,960	11,250
Boys	356	106	19,433	19,895

a. Refers to average of the percentage of correct scores for eight subjects.
Source: Analysis of data from a random sample of 314 primary schools collected and coded by the Oromiya Bureau of Education in the context of the present study.

117. Examples of flaws in the data include the following: (a) it was not possible to match individual students to the specific teachers who taught them; (b) there was no information on process variables, such as whether the school had a parent-teacher association, and how frequently teachers and parents met; (c) there was no information on how intensively and well the teachers used possibly important educational resources, such as radio-assisted instruction; and (d) the fact that learning outcomes are not measured directly but through grade 8 examination results.

118. In passing, it is noteworthy that evening and private students achieve comparable results; that girls fare worse than boys among them; and that both groups lag significantly behind the regular students.

Regression Analysis. The learning environment is defined by tangible features, as well as by processes that work in the background. Typically the tangible features constitute what might be called the mix of school inputs—availability of books, teacher qualification, pupil-teacher ratios, the physical environment, and so on; the background processes refer to classroom management practices, which may be shaped by such factors as the availability of technical support for problem solving, accountability or incentive structures that motivate behavior, information flows that improve management, and so on. Because the choice of school inputs has explicit and direct cost implications, policymakers are justifiably interested in the relation between the inputs and learning outcomes. A particularly relevant input in this regard is the certification of teachers. As earlier sections have noted, the national policy in Ethiopia calls for teachers in grades 5–8 to be graduates of teacher training colleges (TTCs), and for teachers in grades 1–4 to be graduates of teacher training institutes (TTIs). In practice, however, a large number of the TTI-certified teachers are assigned to teach classes at grades 5–8, and the question is whether they are less effective than their better certified colleagues.

The regression analysis reported in Table 5.15 is an attempt to answer that question. Two specifications are shown: one uses individual students as the unit of observation, the other uses schools. Recognizing that teacher certification is not the only factor that influences performance, the regression equation includes other variables that are commonly used in student achievement regressions, including a student's personal characteristics, pupil-teacher ratios, availability of books, and teacher experience. With regard to the results, the coefficient estimates are generally consistent between the two regressions in terms of magnitude and sign. But only three variables consistently achieve statistical significance in both regressions, namely, age of the student, gender, and teacher experience. A curious fact is that teachers with longer experience tend to be less effective, contrary to what one might expect. One possible explanation is that in the absence of continual in-service teacher training, the older teachers may not have kept up with changes in the curriculum and are thus not as effective as their younger colleagues. Again contrary to expectations, the results suggest that TTI-certified teachers are, if anything, slightly more effective than TTC-certified teachers; the difference between them is nonetheless very modest as the coefficient implies that raising the share of TTI-certified teachers by 10 percentage points and reducing the share of TTC-certified teachers to a similar extent would improve scores by a mere 0.1 percentage points above the sample average of 33 percent.

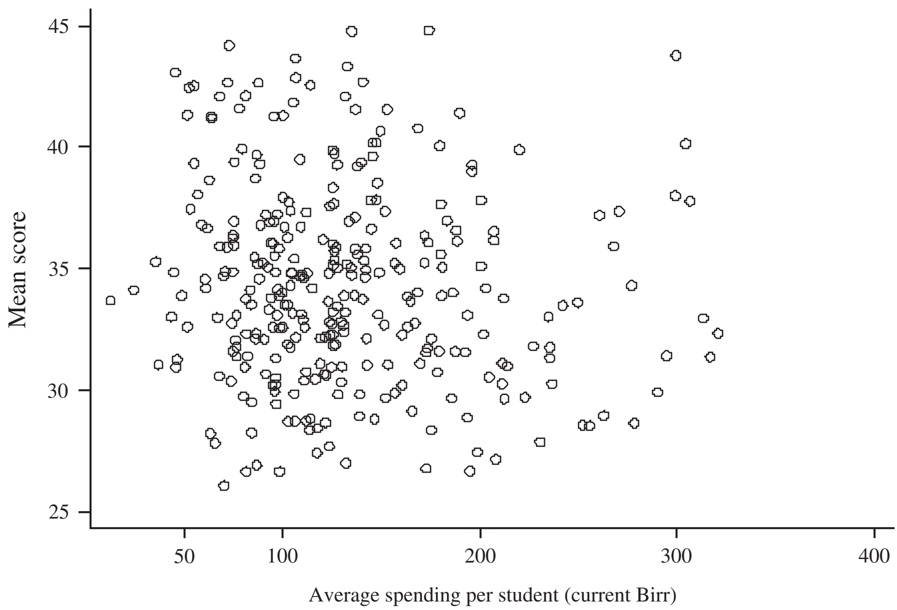
The Scope for Better Management. While the analysis presented above can be refined in a number of ways, the results, if confirmed, are truly disturbing. They imply that differences across schools in some of the tangible factors often considered important account for very little of the differences in performance across students or schools. A moment's reflection reveals why this puzzling result might not be as strange as it first appears. While the tangible aspects of schools define the infrastructure for teaching and learning, they alone cannot yield good results unless the human agents put in charge of them are properly motivated, supported, and held accountable. Indeed, it is conceivable that even the best-equipped school would fail in a poor management environment. The scope for improvement in the sample of Oromiya schools considered above is illustrated in Figure 5.11 below. In the figure, the tangible factors for each school are converted into financial terms and expressed as spending per student, and the result is plotted against the average score of students in

Table 5.15. Correlates of Average Grade 8 Examination Scores, Oromiya, 2001–02

	Regression with individual students as units of observations[a/]			Regression with schools as units of observation[a/]		
Regression variable	Sample average	Coefficient	t-statistic	Sample average	Coefficient	t-statistic
Student characteristics						
Age (in years)	14.77	–0.579**	–23.16	14.88	–0.65*	–2.39
Boy (girl)[b/]	0.64	2.487**	34.24	0.72	3.971*	2.02
Oromo as language of instruction (Amharic)[b/]	0.86	3.584**	34.35	0.95	1.700	1.21
Teacher characteristics[c/]						
Percentage with 10+1 or 10+2	0.42	–0.106**	–8.75	0.26	–0.087	–0.56
Percentage with 12 or 12+1	1.49	–0.026*	–2.53	1.25	–0.009	–0.13
Percentage with TTI certification	87.23	0.010**	3.50	87.51	0.029	1.67
Average years of service	12.58	–0.205**	–18.99	12.17	–0.174**	–2.95
Other school characteristics						
Pupil teacher ratio[d/]	53.17	–0.013**	–6.04	54.68	–0.006	–0.44
Number of books per pupil	2.76	0.097**	4.43	2.55	0.351	1.93
School located in urban area	0.42	0.681**	7.42	0.41	0.480	0.95
Intercept	n.a.	39.407	72.64	n.a.	38.600	7.26
R^2	n.a.	0.146	n.a.	n.a.	0.140	n.a.
Number of pupils in sample	29,905	n.a.	n.a.	n.a.	n.a.	n.a.
Number of schools in sample[e/]	314	n.a.	n.a.	272	n.a.	n.a.

n.a. Not applicable.
*Statistically significant coefficient at the 5 percent confidence level.
**Statistically significant coefficient at the 1 percent level.
a. The dependent variable in both regressions refers to students' average scores on the following eight subjects: Afan Oromo, Amharic, mathematics, English, biology, chemistry, physics, and social science; for students not taking Afan Oromo, the average is computed using the scores for seven subjects. The sample average is 33.0 in the regression using students as the unit of observation; and 34.6 in the regression using schools.
b. Dummy variable, with the omitted category indicated in parentheses.
c. Teachers refer only to those assigned to teach grades 5–8; omitted category are teachers with teacher training college certification; teachers with 10+1 or 10+2 refers to those with one or two years of schooling beyond 10th grade; and teachers with 12 or 12+1 refer to those with 0 or one year beyond the 12th grade; teachers with TTI refer to those with teacher training institute certification.
d. Ratio refers to pupils and teachers in grades 5–8.
e. The sample for the regression using schools as the unit of observation is smaller because it includes only schools whose average grade 8 examination score can be computed from the scores of each of the grade 8 students who took the examination.
Source: Analysis of data from a random sample of some 314 primary schools collected and coded by the Oromiya Bureau of Education in the context of the present study.

Figure 5.11. Relation between Spending Per Pupil and Mean Grade 8 Examination Score across A Sample of Primary Schools in Oromiya Region, Ethiopia, 2001–02



Note: Each circle in the figure represents a sample school. The mean score refers to the average score (percentage correct) of students in each school in the following eight subjects: Afan Oromo, Amharic, mathematics, English, biology, chemistry, physics, and social science; for students not taking Afan Oromo, the average is computed using the scores for seven subjects.

Source: Analysis of Grade 8 examination scores for students in 314 primary schools merged with information for those schools from the 2001–02 school census for Oromiya, and with additional information on teachers in those schools.

the school at the grade 8 examination.[119] As anticipated, the figure shows hardly any relation between the two variables: schools with relatively high levels of recurrent spending are just as likely to outperform as lag behind less well endowed schools. This pattern, which is familiar from similar analyses in other countries, confirms the weak relation between school inputs and learning outcomes already documented above. It identifies a clear need for better management, and it suggests that while the choice of school input mix is important, progress will probably also require reforms to increase accountability for results throughout the system.

119. The salaries of the teachers and their teaching assignment are known, which makes it possible to compute the aggregate teacher wage bill for grades 5–8. The other recurrent costs—salaries of administrative staff and spending on items other than salaries—are reported for the whole school and are prorated to each subcycle according to the size of enrollments. The resulting aggregate spending is divided by the enrollments in grades 5–8 to obtain the spending per pupil at this level.

Issues for Policy Development

Ethiopia faces many challenges in managing the delivery of services in education. The analysis presented in this chapter highlights two issues that warrant special attention. The first concerns the structural policies, particularly those pertaining to standards for teacher recruitment and school construction, that help define the tangible characteristics of the supply of services. The second has to do with management weaknesses in the system that show up in the poor allocation of human and financial resources across schools, and apparently also in the schools' disparate effectiveness in using the resources to deliver learning outcomes. Below we discuss policy options pertaining to these issues, drawing on international experience for an added perspective.

Setting Appropriate Standards for Teacher Recruitment and School Construction. In Ethiopia as in other countries, these standards create a network of schools with some key commonalities. While they are intended to help schools function well, the opposite effect may in fact materialize when budget constraints are ignored in the choice of standards. If standards exceed what the country can afford, schools may meet requirements in the areas explicitly specified, but do so through cutbacks elsewhere that eventually compromise their ability to provide effective services.[120] That this has indeed happened in the Ethiopian system can be seen from the following features: (a) a severe shortage of teachers and classrooms throughout the system leading to both very high pupil-teacher ratios (among the highest in the world) and section sizes; (b) a sizable share of schools with very large enrollments; (c) large shares of teachers in grades 5–8 and 9–12 who do not meet the certification standards; and (d) very limited spending on school administration and nonsalary pedagogical resources. Figure 5.12 shows that all levels of the school system have suffered a persistent deterioration in pedagogical conditions since 1994.

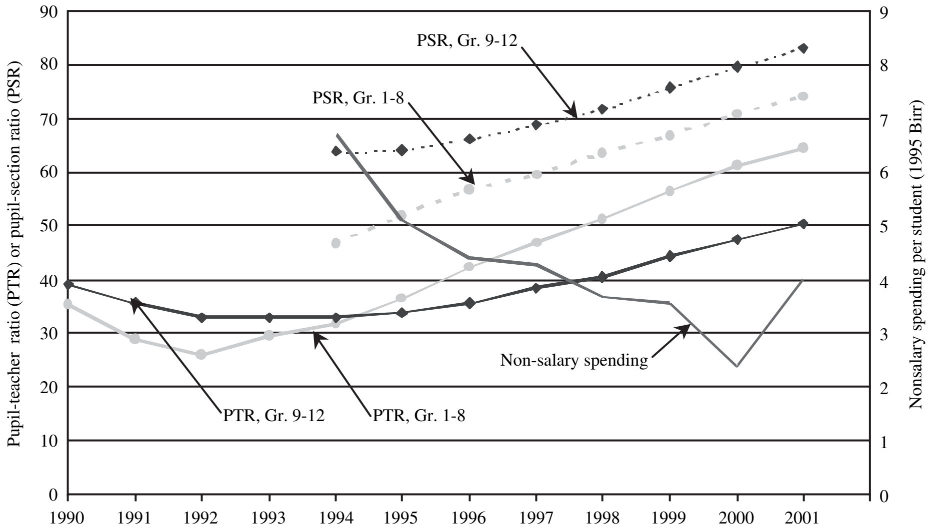
Regions such as Amhara, Oromiya, and Tigray have responded to the deterioration by introducing paraprofessional (uncertified) teachers to relieve the teacher shortage, and encouraged the emergence and growth of lower cost alternative basic education to serve remote rural populations.[121] While such adjustments at the margin will certainly help a school here and there, an improvement for the whole system will require a systematic review of national recruitment and construction standards. Such a review can be facilitated by simulation models to test the impact of alternative options. One such model estimates, for example, that in the absence of changes in recruitment standards—and therefore in the cost of teachers—Ethiopia would need to spend 4.5 percent of its GDP just to attain the Millennium Development Goal of 100 percent primary school completion by 2015.[122]

120. Teacher recruitment and construction standards have important implications for curriculum design. This complex topic cannot be addressed fully here, but we note in passing that what teachers are expected to teach must obviously be calibrated to what they *can* teach, and this in turn depends on their academic profile. Further, the need for supplementary learning space, such as laboratories, particularly in the lower grades, will depend on what is required in the curriculum.

121. Such teachers are typically paid at about half the rate of the regular teachers; in Amhara, the cost of paraprofessional teachers is borne by the regional government, while in Oromiya it is borne by the community in which the school is located.

122. See World Bank and MOE (2004) for a description of the model and an explanation on its use as a tool for policy evaluation.

Figure 5.12. Trends in Pupil-Teacher and Pupil-Section Ratios and in Nonsalary Public Spending Per Primary and Secondary Student, Ethiopia, 1990–2001



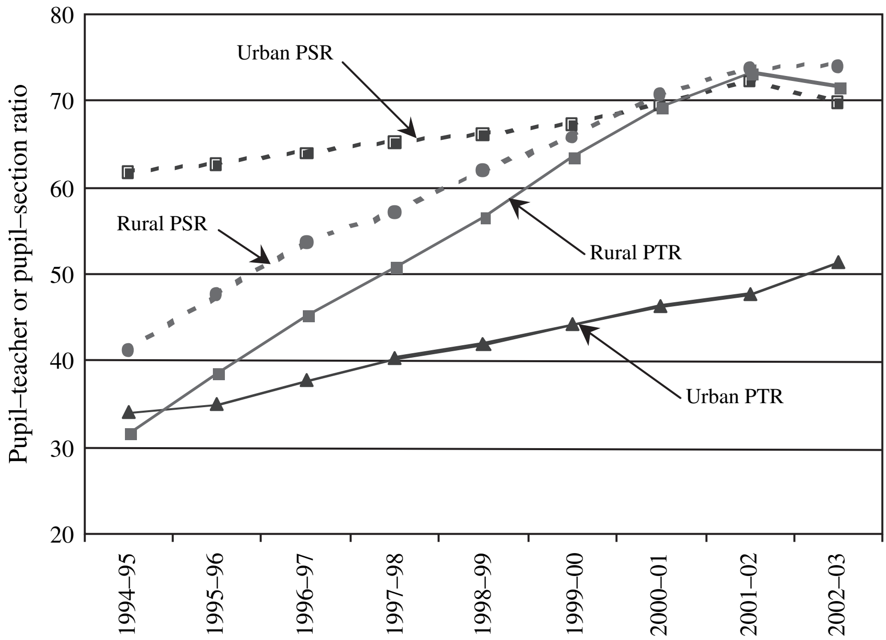
Note: The PTR is computed by dividing total enrollments by the total number of teachers, and the PSR by dividing total enrolments by the total number of sections. These calculations yield weighted ratios which differ from the unweighted ratios computed (as in table 5.10) by averaging the ratios across schools. Non-salary public spending per student is computed by dividing the reported budget amount for this item by the total number of primary and secondary students in government schools.

Source: based on data supplied by the Ministry of Education on enrolments, teachers and sections; and on MOFED budget data on expenditure.

Because the country's recurrent spending on *all* levels of education is only about 3.0 percent of GDP, that very few low-income countries are able to mobilize more than 4.0 percent of the GDP for the whole sector, the fiscal unsustainability of the current standards becomes very clear. As already mentioned, the scope for reducing construction costs is also large; alternative school designs yield an estimated cost reduction of up to 60 percent over certain construction designs currently in use (McArthur 2003 and Coyle 2003).

Allowing for Flexibility Around the National Standards. Flexibility in this regard is particularly relevant in Ethiopia because conditions differ so widely across the country, particularly between urban and rural areas. To appreciate the need for adapted standards, consider first the disparate trends since 1994–95 in the pupil-teacher and pupil-section ratios (PTRs and PSRs) in urban and rural areas (Figure 5.13). Rural schools began with an advantage in these ratios in 1994–95, but the advantage had completely disappeared by 2002–03. Indeed, a highly anomalous situation now exists, in which the average pupil-teacher ratio in rural schools exceeds that in urban schools (71.7 compared with 51.5, a difference of nearly 40 percent); and their average pupil-section ratio

Figure 5.13. Pupil-Teacher and Pupil-Section Ratios in Urban and Rural Primary Schools, Ethiopia, 1994–2003



Note: Because data are available separately for government and nongovernment schools only after 1997–98, the figure uses data for both sectors in all years. Data after 1997–98 indicate that the difference is small between the government-only series and that for both sectors.

Source: Based on data supplied by the Ministry of Education on number of pupils, teachers, and sections.

is likewise greater (74.1 compared with 69.7, a difference of 6 percent). These patterns are unusual because population densities are typically lower in rural areas. They exist largely because in the past, uniformly unaffordable standards for teacher recruitment and school construction had been applied throughout the system regardless of conditions at the local level.

The need for flexible standards is reinforced when one considers the unintended outcomes of past policies. As shown above, applying uniform standards has caused the pupil-teacher ratio to rise and diverge widely between urban and rural schools. We show below that it also causes teaching loads to rise over time, particularly in rural schools. The increase is such that teachers in rural schools now teach as many hours as students spend in class, leaving little scope for the specialized teaching envisaged by the curricula for grade 5 and beyond. These trends make it increasingly difficult both to attract teachers to rural areas and to rationalize the overall deployment of teachers across schools.

For policy development, it is important to understand the precise sources of the adverse consequences described above. Consider then the following algebraic tautology, which simply states that the aggregate weekly hours of instruction that pupils in a school receive (lefthand side) is exactly the weekly hours of teaching supplied by the teachers (righthand side):

$$NS \cdot SH = T \cdot TW$$

where NS is the number of sections of pupils, SH is the number of instructional hours that pupils receive, and T is the number of teachers. Given that NS is the number of pupils divided by the number of pupils per section (PSR) and PTR is the number of pupils divided by the number of teachers, the above equation can be expressed in terms of pupil-teacher and pupil-section ratios, teacher workloads (TW), and students' instructional hours, as follows:

$$\frac{PTR}{PSR} = \frac{TW}{SH}$$

Based on the foregoing relationship, we can easily relate teachers' teaching loads to pupils' instructional time using the relatively plentiful data on the pupil-teacher and pupil-section ratios. Between 1994–95 and 2002–03, teaching loads relative to pupil hours in urban schools rose from 0.55 to 0.74, an increase of 33 percent; in rural schools, it rose from 0.77 to 0.97, a gain of 25 percent (Table 5.16). Although the percentage rise is smaller in rural schools, a ratio that is close to unity implies that by 2002–03, the majority of teachers in rural schools had most likely ceased teaching as subject specialists, even though they may have done so in the past. In both 1994–95 and 2002–03, the ratio between teaching load and instructional hours was significantly greater in rural than urban schools, by 40 percent and 31 percent, respectively; these trends imply that just as specialized teaching has become practically impossible in rural schools, it has also become increasingly difficult to practice in urban schools.

Table 5.16. Pupil-Teacher and Pupil-Section Ratios and Teaching Loads Relative to Pupils' Instructional Hours in Urban and Rural Government Primary Schools, Ethiopia, 1994–95 and 2002–03

	Pupil-Teacher ratio		Pupil-section ratio		Ratio between teachers' teaching load and pupils' instructional hours[a/]		
Year/region	Urban	Rural	Urban	Rural	Urban	Rural	Index (urban=1.00)
1994–95	34.1	31.7	61.7	41.1	0.55	0.77	1.40
2002–03	51.5	71.7	69.7	74.1	0.74	0.97	1.31

Note: Data for Somali excluded because unavailable.
a. Data derived by taking the ratio between the pupil-teacher ratio and the pupil-section ratio, as explained in the text.
Source: Analysis of data from the Ministry of Education's school censuses for the year indicated.

When the ratio between teaching load and instructional hour rises, an interesting question is how the numerator (TW) relates to the denominator (SH). If, for example, schools in both urban and rural areas follow the curriculum strictly and offer the same weekly number of instructional hours, the higher ratio in rural schools must imply that rural teachers carry a heavier teaching load than their urban counterparts. Data on actual teaching loads for teachers in Oromiya confirm the pattern: whereas in urban schools, teachers average 19.5 hours a week of classroom teaching, the load is 27.2 hours a week in rural schools—an astonishing difference of 39 percent (see Table 5.17). Given the large gap, is it any surprise that it is hard to attract teachers to rural schools and keep them there? In Oromiya, graduates fresh out of teacher training colleges typically accept postings to the remotest rural schools, but most seek a transfer to schools nearer a town as soon as they have gained sufficient seniority.

Table 5.17. Average Weekly Teaching Loads by Teacher Certification and Grade in Which Teacher is Teaching, Oromiya, Ethiopia, 2002–03 (in hours)

Locality & grade to which teacher is assigned	Teacher Certification: 10+1; 10+2	12; 12+1	TTI	TTC and equivalent	All teachers
Oromiya	**17.7**	**21.0**	**24.2**	**18.1**	**23.8**
Grades 1–4	18.0	27.4	26.0	22.2	26.0
Grades 5–8	17.5	16.2	21.2	18.0	20.6
Urban schools	**17.5**	**16.6**	**19.9**	**17.0**	**19.5**
Grades 1–4	18.1	21.6	21.6	18.1	21.5
Grades 5–8	17.1	15.8	17.9	17.0	17.6
Rural schools	**23.0**	**27.7**	**27.3**	**22.3**	**27.2**
Grades 1–4	15.0	28.9	28.6	28.9	28.6
Grades 5–8	27.0	20.3	24.5	21.9	24.3

Note: Refers to government teachers only.
Source: Analysis of Oromiya teacher census for 2002–03.

If instructional hours are relatively uniform across schools in urban and rural areas throughout the country as they are in Oromiya, differences in the teaching loads of teachers in urban and rural schools can be inferred from data on pupil-teacher and pupil-section ratios, based on the algebraic relationships discussed earlier. In particular, the average teaching load of rural teachers as a multiple of the average load of urban teachers is simply the ratio between teacher's teaching load and pupils' instructional hours in rural schools relative to the corresponding ratio for urban schools. The results across regions in 2002–03 appear in the last column of Table 5.18 below. The diversity across regions is striking: workloads for rural teachers are comparable to those for urban teachers in Addis Ababa; they are between 11 and 16 percent heavier in Tigray, Benshangul-Gumuz, Harari, and Dire Dawa; and they are as much as 67 percent heavier in Gambella.

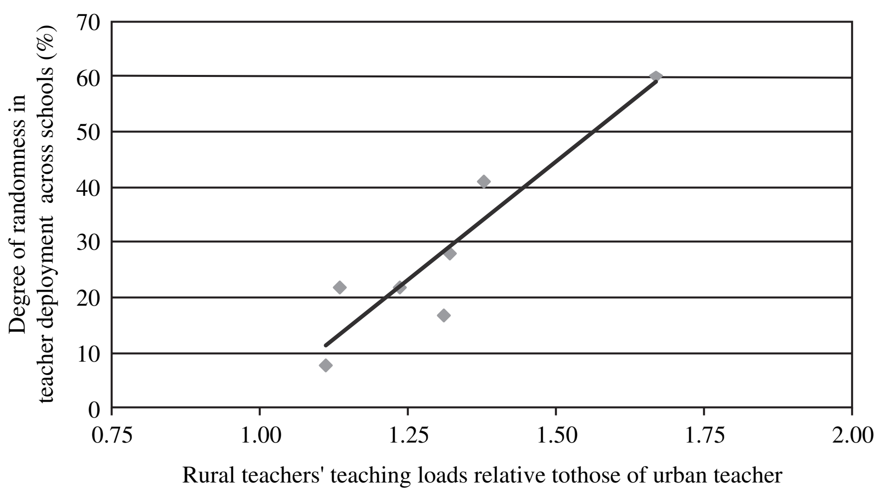
Consistent with the wide urban-rural gap in teaching load in Gambella, the region (which has a total of only 108 schools offering primary school instruction) also has the greatest difficulty among all the regions in rationalizing the deployment of its government primary school teachers across schools. As indicated earlier in this chapter, we can use the R^2 statistic from a regression relating numbers of pupils and teachers across schools to compute $1–R^2$ as a measure of the degree of randomness in teacher deployment. Figure 5.14 relates this index of randomness to the teaching loads of rural teachers relative to their urban

Table 5.18. Pupil-Teacher and Pupil-Section Ratios and Teaching Loads Relative to Pupils' Instructional Hours in Urban and Rural Government Primary Schools, by Region, Ethiopia, 2002–03

Region	Pupil-Teacher ratio		Pupil-section ratio		Ratio between teachers' teachingload and pupils' instructional hours[a/]		
	Urban	Rural	Urban	Rural	Urban	Rural	Index (urban=1.0)
Ethiopia	**51.5**	**71.7**	**69.7**	**74.1**	**0.74**	**0.97**	**1.31**
Tigray	59.8	59.7	67.1	60.2	0.89	0.99	1.11
Afar	33.9	25.5	56.0	32.1	0.61	0.79	1.31
Amhara	60.3	74.7	74.4	74.5	0.81	1.00	1.24
Oromiya	55.8	75.2	74.4	75.8	0.75	0.99	1.32
Benshangul-Gumuz	51.8	48.8	72.2	59.8	0.72	0.82	1.14
SNNPR	51.5	73.7	76.4	79.4	0.67	0.93	1.38
Gambella	31.9	41.2	70.3	54.5	0.45	0.76	1.67

SNNPR Southern Nations and Nationalities Peoples Republic.
Note: Data for Somali excluded because unavailable; data for Addis Ababa, Harari, and Dire Dawa excluded because of the largely urban character of these localities.
a. Data derived by taking the ratio between the pupil-teacher ratio and the pupil-section ratio, as explained in the text.
Source: Analysis of data from the Ministry of Education's school censuses for the year indicated.

Figure 5.14. Relation between Relative Teaching Loads in Rural and Urban Schools and Randomness in Teacher Deployment across Regions, Ethiopia, 2002–03



Note: Each point denotes a region; Somali excluded for lack of data; and Harari, Addis Ababa, and Dire Dawa excluded because of their largely urban character.
Source: Based on data in tables A5.5 and 5.18.

counterparts. The positive link between these variables is what one might expect: the more disparate the work conditions between urban and rural areas, the more difficult it is to rationalize teacher deployment across schools.

Assessing the Tradeoffs in Teacher Recruitment Options in Rural Areas. Setting fiscally unsustainable standards typically sets off a vicious cycle of worsening conditions that eventually harms rural schools the most. In 1994–95, the standards did not seem overly demanding, but as enrollments grew and the demand for teachers rose, the effects of budget constraints began to set in, even as the government started to commit more resources to education. Yet the increase was constrained by competing demands on government funds, and the education system adapted by default through increases in pupil-teacher and pupil-section ratios as well as in teaching loads. Teaching posts in rural areas are typically less attractive to begin with than those in urban areas: there is no electricity or running water, no social services, entertainment, or other amenities to provide for a comfortable family life; the opportunities for teachers to earn extra income by teaching in evening classes are also limited, if not entirely absent. But under the circumstances, they have become even more unattractive because teachers in rural schools carry substantially heavier teaching loads than their urban counterparts. Indeed, in terms of earnings per hour of classroom teaching, rural teachers currently earn only about 75 percent as much as similarly certified teachers in urban schools. This fact is not lost on teachers, and it exacerbates the already difficult task of recruiting and retaining teachers in rural schools.

Relieving the staffing pressures in rural schools will require a recruitment policy adapted to conditions in rural areas. One option involves incentive packages that are attractive enough to hire and retain the desired number of certified teachers in rural areas. Naturally, the issue of costs arises. If our estimates are a guide, teacher wages for rural postings would have to rise by as much as 30 percent, on average, just to compensate for the bigger workloads in rural schools, and they would need to rise even more if quality-of-life differences were also taken into account. The question is whether the resources can be found to pay for these packages, and whether the money thus spent will have been put to the best use in terms of schooling outcomes. A second option currently implemented throughout the country (albeit in an ad hoc manner), particularly in the centers offering alternative basic education, involves hiring teachers at lower cost from local labor pools who satisfy minimum standards of certification (grade 10 or grade 12 graduates rather than TTI graduation). The issue here is quality: can such teachers teach the curriculum; can they be trained to do so; and most important, are they effective? In the end the choice comes down to these tradeoffs: increasing public spending dramatically to put sufficient numbers of teachers that meet national standards into rural schools so that these schools can function properly, versus adapting teacher certification and curriculum standards to local conditions in rural areas in order to hire the desired number of teachers within the available budget.

Taking Advantage of Decentralization Based on Lessons from International Experience. As mentioned above, Ethiopia is currently undergoing a profound decentralization of the structure of government. Budgets are allocated to the regions in block grants, and the regions in turn are expected to make block grants to the *woredas* governments. In the new governance landscape, these subnational governments are directly responsible for service delivery in primary and secondary education (as well as some other subsectors). As noted in this chapter, two major challenges loom large for them in this regard, namely, improving discipline in the allocation of resources across schools, so that human and financial resources are effectively channeled to the frontlines (the school); and reducing the disconnect between resources and learning outcomes. Although the process of decentralization is at an early stage, and roles, responsibilities, and governance frameworks are still being defined and refined, Ethiopia might well note the accumulated experience of other countries who are further along in education decentralization. Winkler and Gershberg (2003) distill the following lessons based mostly on experiences in Latin America and Eastern Europe:

- "Efficiency and effectiveness are most likely to improve under decentralization when service providers—schools, local governments, or regional governments—are held *accountable for results.*
- Accountability requires *clear delineation of authority and responsibility* and transparent and *understandable information* on results (both educational and financial).
- Decentralization of real decision making power to schools or school councils can significantly increase *parental participation* in the school, and high levels of parental and community participation are associated with improved school performance.
- Decentralization of education to sub-national governments does not in and of itself empower parents and improve *school performance.* Further decentralization to schools (school councils or school boards) or local communities does empower parents and can improve school performance.
- For decentralization to schools to be successful, *principals* must acquire new skills in leadership and management—financial, of teachers, and with the community.
- The *design of financial transfers* to sub-national governments or schools has powerful effects on both efficiency and equity.
- Decentralization requires that national and/or regional *ministries of education* be restructured; failure to restructure ministries is a serious obstacle to realizing the benefits of decentralization.
- The decentralization of *teacher management* is critical to creating accountability and realizing the potential benefits of decentralization.
- National education ministries frequently resist decentralization on the grounds that sub-national governments, communities, and/or schools lack the *capacity to manage* education. In practice, this is seldom true.
- Real decentralization is a long, evolutionary process."

Bearing in mind Winkler and Gershberg's last point, one sees clearly that decentralization in Ethiopia will take time to produce the results expected of it. While not all aspects of other countries' experiences are applicable—or indeed, even useful—the concepts are highly relevant and the lessons from international experience can already be incorporated to cultivate the key characteristics and behavior patterns that characterize high-performance systems: clarity of mission, roles, and responsibilities; effective empowerment of the relevant actors; greater parent participation in schools; and, above all, an emphasis on accountability for results. The Ethiopian government has already set the process in motion, as reflected in its recently issued "Guidelines for Organization of Educational Management, Community Participation and Educational Finance" (Govt. of Ethiopia 2000d). Regional and local governments are moving rapidly to claim and exercise their new powers, for example, by adapting policies on teacher training, recruitment, and remuneration, as well as school construction to local realities. In this evolving context, it will be important for the central government to provide flexible guidelines without stifling local initiatives, to encourage problem solving and learning-by-doing through systematic evaluation of new initiatives, and to facilitate the exchange of ideas for improving the system's performance at all levels of management.

Mobilizing and Using Information to Enhance Accountability for Results. Strengthening accountability for results is difficult in schooling because many actors are involved and the outcomes are typically multidimensional. Yet appropriate use of information flows can help improve performance by ensuring that resources are at least reaching schools. In Uganda a large-scale public dissemination of information on grants for schooling gave schools and parents the information they need to monitor the grants. Over the space of just six years, the leakage of funds fell from 80 to 20 percent, and schools were able to use the resources now reaching them to purchase textbooks and other pedagogical inputs (World Bank 2004a). Information flow can of course be channeled in other ways too; report cards such as those used in Parana State in Brazil are an interesting example (Servilla and Winkler 2003). They provide schools with information that compares indicators for the school (for example, pupil-teacher ratios, examination results, and parent feedback) with reference averages at the national and relevant subnational levels. Report cards for school districts and other higher levels of aggregation can also provide similar comparative information. The availability of such information may be expected to improve conditions in schools in two ways: by creating incentives for underendowed schools to seek redress; and by pinpointing specific schools in the system that warrant the attention of those in charge. In Ethiopia, as in other countries, the use of information on student achievement for accountability purposes remains at an early stage. The country has already established a baseline, and this can be built on as part of the broader effort to mobilize appropriate information for better management.

Conclusion

Ethiopia's education system is poised to continue in the coming years as the country makes progress toward achieving the Millennium Development Goal of universalizing primary school completion by 2015. If in that year all the children ages 7–10 were enrolled, the system would be catering to nearly 11 million pupils in just grades 1–4 alone, up from about 6 million today. In such a large system, the challenges of good management become even more daunting. Ideally, access and learning outcomes must both improve without putting a heavy burden on the public purse. While the solutions to these complex challenges will require a deeper assessment than has been possible here, this chapter has highlighted the need to adapt national standards, particularly for teacher recruitment and school construction, so as to avoid continued and probably inevitable deterioration of the country's already poor conditions in schools. These conditions are manifested in exceptionally high and rising pupil-teacher ratios, overcrowded classrooms and schools, and a dearth of instructional materials. At the same time, the process of decentralization is a very promising development, but its ability to improve the education system's performance will require, among other things, changes that give parents and communities a real say in how schools are run, increase accountability at all levels in the system, and provide appropriate information flows to give concrete meaning to the concept of accountability.

CHAPTER 6

Aspects of the Market and Nonmarket Benefits of Schooling

This chapter brings together some key aspects of the market and nonmarket benefits of education. It documents the impact of education on agricultural productivity and on workers' wages in the modern sector; consolidates available information on the relation between education and poverty, fertility and child health and nutrition; and sheds light on the transition between school and work among recent labor market entrants so as to provide an added perspective on the implications for policy development. While admittedly not exhaustive, the information presented creates a basis for dialog on ways to ensure that investments in education respond to the economy's requirements for trained labor, while also promoting widespread social wellbeing.

In brief, the assembled evidence offers clear support for the government's intention to make education a centerpiece of its strategy for economic and social development. Because of past neglect, the average Ethiopian adult has fewer than two years of formal schooling. This weak human capital base has not only impeded economic productivity among farmers and other workers but also made it difficult to reduce poverty and improve the country's social indicators. Raising the educational profile of the population is thus critical for the country's future progress. In practice, it makes sense to expand the education system in stages: universalizing at least four years of schooling as soon as possible, which serves both economic and social goals, while expanding the other levels more slowly. This approach recognizes that tradeoffs are inevitable in the allocation of ultimately limited resources for education and that the economy may also face constraints in its capacity to absorb large numbers of educated labor, particularly in the short run.

Employment Patterns and Workers' Educational Attainment

To set the stage for discussing the external efficiency of education, this section presents data on the structure of the economy and the educational profile of the workforce.[123] To summarize, more than 80 percent of Ethiopia's workforce in 2001 is employed in agriculture and most of the workers are either self-employed or used as unpaid family labor. The latter category remains dominant, even though the share has shifted in favor of self-employment since 1994. Literacy rates are generally low in Ethiopia: in 2001, seven in ten workers could not read or write. In agriculture, nearly 80 percent of the workforce is illiterate, while the corresponding share in the formal sector is about 28 percent.

Aggregate Patterns of Employment. Table 6.1 shows the size of the labor market and selected indicators of labor force participation. During the 1990s and in 2001, the share of Ethiopians aged 10 years and older who were working or actively looking for a job has remained relatively stable at between 72 and 75 percent. As is typical of low-income economies, the rate of unemployment is modest: in 2001, only 5 percent of the active labor force reported being jobless, while the share was 3 percent in 1994 and 8 percent in 1999.

Table 6.1. Trends in the Economically Active Population, Ethiopia, 1994, 1999 and 2001 (In thousands unless otherwise indicated)

Indicator	1994	1999	2001
Population aged 10 and above	36,626.4	36,022.2	36,795.9
Population in the labor force	26,503.1	27,068.3	27,168.2
Employed population	25,732.2	24,896.6	25,747.6
Labor force participation rate (%)[a/]	72.4	75.1	73.3
Unemployment rate (%)[b/]	2.9	8.0	5.2

a. Percentage of population age 10 and older who are employed or seeking a job.
b. Percentage of the jobless among the population age 10 and older who are either employed or seeking a job.
Source: Data for 1994, the 1994 Ethiopia Housing and Population Census; for 1999, authors' estimates based on the 1999 Ethiopia Labor Force Survey (ELFS); for 2001, authors' estimates based on the 2001 Ethiopia Stand-Alone Child Labor Force Survey (ESACLFS).

Among those in the labor force, a significant share are children of school-going age: according to the 2001 Ethiopia Stand-Alone Child Labor Force Survey (ESACLFS), those ages 10–14 account for some 24 percent of the employed population; more than half of these young workers are engaged in economically productive activities (production of goods and services for sale or exchange).[124] Although the legal minimum age for starting work in

123. Because of differences in definitions and data collection methods, the data for 1994, 1999 and 2001 are not strictly comparable. They nonetheless offer a perspective on trends in labor market developments over time.

124. See Table A.6.1 for percentages based on the 1999 Ethiopia Labor Force Survey. In general the percentages are typically smaller than those based on the 2001 Ethiopia Stand-Along Child Labor Force Survey—a pattern that is perhaps to be expected given that the latter survey was intended to ensure that children's work activities are fully captured.

Ethiopia is 10 years, nearly 40 percent of those ages 5–9 already report being engaged in a productive activity; among boys, the share rises to nearly half (Table 6.2). The significant rate of labor market participation by school-age children is consistent with the pattern in other low-income countries. As discussed elsewhere in this report and confirmed by the data in the table, not all work by children is incompatible with schooling, particularly if the activities do not require a substantial time commitment. Thus, among children ages 10–14 who perform housekeeping and other unpaid domestic chores, two-thirds are enrolled for school (which is only slightly smaller than the share of 70 percent among non-working children); and among those who work in productive activities (with or without housekeeping or other household chores), the share enrolled for school is still high at 43 percent.

Table 6.2. Labor Force Participation by School-Age Children, Ethiopia, 2001

Indicator	Ages 5–9	Ages 10–14	Ages 5–14
Population (thousands)	8,625.4	6,533.1	15,158.5
Percent not working	25.4	4.2	16.3
Percent working	74.6	95.8	83.7
In unpaid domestic activities only [a/]	35.4	33.0	34.4
In productive activities only [b/]	5.3	6.7	6.0
In both productive and domestic activities	33.9	56.0	43.4
Percent enrolled in school among:			
Non-working children	19.3	69.9	24.9
Working children	26.9	51.5	39.0
In unpaid domestic activities only	31.1	68.2	46.5
In productive activities only or in productive and domestic activities	23.1	42.7	33.9
Percent working in productive activities			
Among boys	48.3	73.2	59.1
Among girls	29.7	51.8	39.2
Among children in urban areas	5.0	22.5	14.2
Among children in rural areas	42.9	69.8	54.1

a. Domestic activities refer to personal services of a domestic nature provided by unpaid household child members in the household of their own parents, grandparents or guardians, or spouse. The services include such chores as preparing and serving meals; making, mending, washing and pressing clothes; shopping; caring for siblings or sick and infirm persons in the household; cleaning and maintaining dwelling; transporting household members or their goods; and so on.
b. Productive activities refer to the production of goods and services for sale or exchange; and production and processing of primary products (e.g. agriculture, hunting, etc.) for own consumption or sale on the market; and own account construction or other fixed asset formation.
Source: authors' estimates based on the 2001 ESACLFS.

Distribution of Employment by Sector and Type of Work. Between 1994 and 2001, the share of Ethiopian workers in agriculture declined—by some 7 percentage points—while the share of workers in industry and in commerce and other services rose (Table 6.3). Yet agriculture remains dominant, employing four out of every five workers. Thus, while the

Table 6.3. Distribution of Employment by Economic Sector, Ethiopia, 1994, 1999 and 2001

	1994	1999		2001	
Economic sector	Percentage share	Number of workers (thousands)	Percentage share	Number of workers (thousands)	Percentage share
Agriculture, hunting, forestry and fishing	89.3	19,869.1	79.6	21,143.5	82.1
Mining and quarrying	0.1	15.7	0.1	26.3	0.1
Manufacturing	1.8	1,107.2	4.4	914.9	3.6
Construction	0.3	228.5	0.9	162.6	0.6
Electricity, gas and water supply	0.1	28.0	0.1	33.9	0.1
Wholesale, retail trade and catering	4.2	2,341.9	9.6	1,948.1	7.6
Transport, storage and communication	0.6	122.9	0.5	111.0	0.4
Financial intermediation	0.1	19.6	0.4	16.8	0.1
Other services	3.6	1,163.7	4.4	1,390.6	5.4
All sectors	100	24,896.6	100	25,747.6	100

Sources: data for 1994, 1994 Ethiopia Population and Housing Census; data for 1999, 1999 LFS; data for 2001, 2001 ESACLFS.

prospects for work elsewhere in the economy have improved between 1994 and 2001, such jobs are still relatively rare.

With regard to types of jobs, the data in Table 6.4 indicate that most jobs are in the informal sector: self-employed and unpaid family workers account for about 90 percent of all workers in 2001, about the same as in 1994. The unpaid workers continue to make up the single largest block of workers with a share of about 50 percent in of all workers in 2001. Salaried jobs remain rare, even though their share grew from about 6 percent of all jobs in 1994 to nearly 9 percent in 2001. Salaried jobs requiring the highest qualifications—managerial jobs and professional and technical jobs—represent only 1.4 percent of all jobs in 1999.

Educational Attainment of the Workforce. The number of educated workers in Ethiopia has risen over time, thanks to the government's massive investment since 1994. Yet, the gains have made only a modest impact on the illiteracy rate, which fell from 77 percent in 1994 to 71 percent in 2001 (Table 6.5). The educational profile of workers differs greatly across sectors, however. In agriculture, nearly 80 percent of the workers are illiterate, and 11 percent have between one and four years of primary schooling; workers have on average some 1.7 years of schooling. By contrast, in the formal sector, only 28 percent of the workers are illiterate and workers have on average more than 7 years of schooling.

Table 6.4. Distribution of Employment by Type, Ethiopia, 1994, 1999 and 2001

		1999							
		Formal sector		Informal sector		Both sectors		2001	
Type of Employment	1994 %	No. of workers ('000)	%	No. of workers ('000)	%	No. of workers ('000)	%	No. of workers ('000)	%
Salaried jobs	5.7	1,117.5	90.2	914.3	3.9	2,031.8	8.2	2,212.8	8.6
Executives	—	103.0	8.3	1.7	0.0	104.8	0.4	109.8	0.4
Technicians/ associate professionals	—	190.8	15.4	8.8	0.0	199.6	0.8	255.9	1.0
Others	—	823.7	66.5	903.7	3.8	1,727.4	6.9	1,847.0	7.2
Apprentices	0.0	3.5	0.28	8.5	0.0	12.0	0.1	19,2	0.1
Employers	2.6	3.6	0.29	189.1	0.8	192.6	0.8	239.0	0.9
Self-employed	39.5	38.9	3.14	10,798.8	45.7	10,837.7	43.5	10,129.9	39.3
Unpaid family workers	51.1	20.0	1.62	11,677.5	49.4	11,697.5	47.0	12,770.7	49.6
Others	1.1	55.4	4.47	69.5	0.3	124.9	0.5	376.0	1.5
All types	100.0	1,238.9	100.0	23,657.7	100.0	24,896.6	100.0	25,747.6	100.0

—Data unavailable.
Source: for 1994, the 1994 Ethiopia Population and Housing Census; for 1999, authors' estimates based on the 1999 LFS; for 2001, authors' estimates based on the 2001 ESACLFS.

The Market Returns to Education

In this section, we present evidence on the returns to education in agriculture and in salaried employment. This evidence has been distilled from the results reported in the most reliable published reports accessible at the time of report writing. It is supplemented by original estimates of the returns to education in salaried employment that were prepared for this report using data from the 2001 Ethiopia Stand-Alone Child Labor Force Survey. Although the focus of this survey was child labor, it contains information on the earnings of all members of households sampled, and as such provide the data needed for the estimates on returns.[125]

Education and Agricultural Productivity. Ethiopian farmers are in general technically inefficient: a careful study by Suleiman (1995) suggests that outputs would have increased by

125. By contrast, the 1999/2000 Household Income and Consumption Expenditure Survey (HICES) and the Welfare Monitoring Survey (WMS) contain earnings information only for the household head. Although such data can also be used to estimate earnings functions, the underlying data suffer from obvious limitation because of selection bias. For the results based on these data see Table T3.3 in Technical Note 3.

Table 6.5. Educational Attainment of Workers Aged 10 and Above, Ethiopia, 1994, 1999 and 2001

	1994	1999 Formal sector	1999 Informal sector Overall	1999 Informal sector Agriculture	1999 All sectors	2001
Distribution by educational attainment (%)						
Illiterate	76.6	27.6	75.9	78.5	73.5	70.5
Literacy campaign and non formal education	—	4.9	4.5	4.6	4.5	3.6
Grades 1–4	—	7.0	10.7	10.5	10.5	12.9
Grades 5–6	—	7.7	4.4	3.7	4.6	5.2
Grades 7–8	—	7.8	2.6	1.8	2.8	3.2
Grades 9–12	—	25.4	1.8	0.8	3.0	3.2
Above grade 12	—	19.5	0.1	0.0	1.1	1.3
All education levels	100.0	100.0	100.0	100.0	100.0	100.0
Average years of schooling	—	7.1	1.7	1.5	2.00	1.5
Employed population (in thousands)	25,732.2	1,238.9	23,657.7	19,869.1	24,896.6	25,747.6

—Data unavailable.
Source: For 1994, the 1994 Ethiopia Population and Housing Census; for 1999, authors' estimates based on the 1999 LFS; for 2001, authors' estimates based on the 2001 ESACLFS.

50 percent had the farmers used the right technology.[126] For our purpose here, the issue is whether or not education makes a difference to their performance. If international experience is a guide, we should expect educated farmers to be more willing to adopt new farming techniques, to be able to manage their production better, and to be generally more productive (see, for example, Jamison and Lau 1982 and Rozenzweig 1995 for well-known summaries on the international evidence in this regard). For Ethiopia, we summarize the results reported in Weir (1999), perhaps one of the most accessible works on the topic at this writing.[127] As in Suleiman, Weir relies on data from the first round of the Ethiopia Rural Household Survey (ERHS). He estimates standard production functions that relate the value of cereal crops to a set of inputs (land, human, and animal [ox] labor, and capital) as well as

126. The results reported in Suleiman (1995) were generated by applying the analytical technique of data envelopment analysis to data from the first round of the Ethiopia Rural Household Survey (ERHS) conducted in 1994 by the Department of Economics, Addis Ababa University, in collaboration with the Center for the Study of African Economies, Oxford University, and the International Food Policy Research Institute, Washington D.C. The data covered 1,477 households associated with 18 peasant associations, in 15 *woredas* and six regions. Data for about 250 farmers were used in Suleiman's analysis. The ERHS, which is a nonrepresentative panel survey, captures information on the family background in each household as well as their activities pertaining to production, consumption, and access to and use of credit.

127. Other citations include Asfar and Admassie (1996) and Croppenstedt, Demeke and Meshi (1999). Unfortunately neither of them was accessible at the time of writing.

to a set of household characteristics, including the educational attainment of the household head and all the adult workers on the farm. Table 6.6 displays a summary of the results pertaining to the education variables. They show that farmers' average years of schooling have no influence on agricultural productivity—a disappointing but not surprising finding, given the extremely low stock of human capital among farmers. When educational attainment is specified in terms of dummy variables, however, the regression estimates indicate that farmers with four to six years of primary schooling are significantly more productive than those who are either illiterate or have three or fewer years of schooling. On the assumption that investing in four to six years of primary schooling involves three years of forgone production, the magnitude of the estimated regression coefficients imply a return of between 5 and 7 percent a year, depending on the regression specification.

Table 6.6. Regression Estimates of the Effect of Education on Farmer Productivity, Ethiopia, 1994

	Specification 1: Education of household head			Specification 2: Education of all adults workers on the farm		
Specification of the education variable in the regression equation	Sample average	Effect on the the log of value of cereal crops	Rates of returns (%)[a/]	Sample average	Effect on log of the the value of cereal crops	Rates of returns (%)[a/]
Years of schooling	1.14	–0.01	n.s.	1.45	0.01	n.s
Level of education						
Illiterate (omitted category)	0.63	—	—	0.56	—	—
Grades 1–3	0.25	–0.06	n.s.	0.33	0.05	n.s.
Grades 4–6	0.08	0.12**	6.6	0.09	0.18*	4.6
Grade 7 and higher	0.04	–0.33	n.s.	0.02	–0.14	n.s.

—Not applicable.
n.s. Not statistically significant.
*Statistically significant at the 10% level.
**Statistically significant at the 5% level.
Note: Estimates are based on 616 observations; see Weir 1999 for complete results on coefficient estimates for other regression variables.
a. Computed on the assumption that workers with an educational attainment of grades 4–6 forgo three years of earnings.
Source: Weir 1999—tables 3a and 3.b, equation 5a for years of schooling; Tables 4a and 4b, equation 11a for education dummies.

The positive relation between education and farmer productivity works through many channels. Among them is the widely documented tendency of better-educated farmers to adopt modern farming technologies and inputs (Lau and Jamison 1982; Rosenzweig 1995). The behavior of Ethiopian farmers is no different, as the findings in various studies confirm (Croppenstedt, Demeke and Meshi 1999; Tesfaye and Shiferaw 2001; and Weir and Knight 2000). To illustrate, the results in Weir and Knight (2000) on the impact of education on fertilizer use—based again on the ERHS data—are summarized in Table 6.7 below.[128] They show that each additional year of schooling above the sample mean raises the probability of fertilizer use by 1.3 percent. Interestingly, peer group effects are very large: an additional year of schooling among adults in the locality of the farm raises the probability of fertilizer use by nearly 22 percent, regardless of the farmers' own level of educational attainment. The magnitude of this estimate is comparable to the finding reported in Croppenstedt, Demeke, and Meshi (1999) that the rate of fertilizer use is 29 percent more intensive among literate farmers than among their illiterate counterparts. The role of peer group effects suggests that if education is to help improve farmer productivity, the strategy would necessarily involve broadening access to basic schooling as much as possible.

Table 6.7. Education's Influence on Fertilizer Use, Ethiopia, 1994

Indicator	Sample mean	Estimated marginal effect on the probability of fertilizer use
Average years of education of all adults		
In farmer's household	1.47	0.013*
In the locality of the farm (i.e., peasant association)	1.46	0.217*
Percentage of farmers using fertilizer	46	n.a.

n.a. Not applicable.
*Denotes statistical significance at the 10% level.
Note: Estimates are based on data for a sample of 1,191 farmers.
Source: Weir and Knight 2000—table 1 for sample average; Table 7, equation 1, for estimates of the marginal effects.

Education and Earnings Among Salaried Workers. Consider first the pattern of mean earnings shown in Table 6.8. It reflects the expected positive relation between earnings and education: on average, those with higher education earn 93 percent more than those with secondary education; those with secondary education earn 47 percent more than those with only a Grades 5–8 primary education; those with a Grade 5–8 education, in turn, earn about 76 percent more than those with only a Grade 1–4 education; and the latter earn about 72 percent more than workers who are illiterate. That earnings rise with educational attainment is a pattern found among men and women workers, as well as among those in urban and rural areas.[129]

128. The analysis involves estimation of a probit model in which the regressors include the main characteristics of the farmer's household and his land, as well as the average years of schooling of adults in the farmers' household, and in the locality of the farm (peasant association).

129. The pattern is consistent with those reported in Krishnan, Selassie and Dercon (1998). The data from this study also reveal the characteristic wage compression in the public sector: at low levels of qualification, workers earn more than their private sector counterparts, but as the level of education rises, the opposite is true. Thus, while the government pays workers with less than a primary education 24 percent more than similarly qualified workers in the private sector, it pays workers with secondary education 17 percent less, and workers with higher education, 14 percent less, than workers in private employment with a corresponding level of education.

Table 6.8. Monthly Mean Earnings by Level of Education, Ethiopia, 2001
(Current Birrs)

Workers' level of educational attainment	Whole sample	Gender		Area	
		Male	Female	Urban	Rural
Illiterate	75	96	61	84	63
Primary education					
Grade 1–4	129	174	77	129	131
Grade 5–8	227	281	136	238	147
Total	193	248	112	203	139
Secondary education	334	378	266	347	256
Higher education	645	681	552	701	378
No. of observations in sample	9,145	5,221	3,924	952	8,193

Note: Wage earners paid on a monthly term of payment only; excluding workers with a secondary occupation.
Source: authors' estimates based on the 2001 ESACLFS.

The Private Returns to Education. The foregoing patterns provide a first hint that education is an attractive investment for individuals seeking salaried employment. Several studies have attempted to quantify the magnitude of the returns but as Technical Note 3 documents and explains, none of them is free from serious data limitations and other constraints which make it difficult to draw solid conclusions from the results.[130] Below we report on new results which are based on the recently released 2001 Ethiopia Stand-Alone Child Labor Force Survey in which earnings data were collected from all adult members of the sampled households (Table 6.9). The returns are computed from the coefficient estimates in standard Mincerian earnings equations.[131]

For the country as a whole, the private returns follow a U-shape, in which they are highest at the lowest levels of educational attainment as well as at the top end. Given these patterns, it is not surprising that the demand for education is strong throughout the system. The U-shape is also characteristic of the returns to education among men. Compared with men, women receive higher returns on their education at all levels except the lowest. Finally, the pattern of returns in urban and rural areas also add new insight: for Grades 1–4, the returns in rural returns are much higher than those in urban areas; but they also drop off much more precipitously than in urban areas as the level of education rises, falling to only 8 percent a year for Grades 9–12, compared with a still reasonably high 12 percent in urban areas. We can thus expect the demand for schooling in rural areas to weaken considerably beyond grades 1–4. Further, it is possible that even in grades 1–4, the lack of

130. See Technical Note 3 for a more detailed commentary on the available studies that were published after 1990. See especially Table T3.4 which summarizes the estimate of returns from the most reliable of the studies. Data for 1994 suggest that in urban areas, an additional year of schooling yields a return of about 7 to 9 percent a year, depending on sector of employment, compared with as high as 18 percent a year in rural areas; estimates based on data for 2000 indicate a return of 16 percent a year. The latter data also suggest that the private returns average 33 percent a year for primary education, 19 percent for secondary education, and 22 percent for higher education.

131. See Table 6.9, footnote a.

Table 6.9. Private Rates of Returns to Education by Level of Education, Ethiopia, 2001
(percent per year unless otherwise indicated)

	Ethiopia		Men		Women		Urban		Rural	
Educational attainment	Average years of schooling	Returns	Average years of schooling	Returns	Average years of schooling	Returns	Average years of schooling	Returns	Average years of schooling	Returns
Illiterate	0	—	0	—	0	—	0	—	0	—
Grade 1–4	3.0	25	3.1	30	2.9	15	2.9	22	2.8	38
Grade 5–8	6.6	15	6.6	12	6.6	16	6.6	15	6.4	11
Grade 9–12	11.3	12	11.3	10	11.4	17	11.3	12	11.2	8
Diploma	14.0	39	14.0	38	14.0	40	—	—	—	—
Degree	17.0	22	17.0	20	17.0	30	—	—	—	—

—Not applicable.

a. The returns are calculated as [(exp(bj–bi)–1]/[mj–mi] where bj is the regression coefficient of the educational dummy variable j and mj is the corresponding average years of schooling (see appendix A6.2 for the relevant regression estimates).

Source: analysis of the 2001 Ethiopia Stand-Alone Child Labor Survey (ESACLFS).

information about schooling's benefits may lead parents, particularly those who have themselves never been to school, to underestimate the returns and thus under invest in their children's schooling, particularly that of their daughters.

The Impact of Education on Poverty and Nonmarket Outcomes

Education also produces benefits through its impact on poverty and other indicators of the population's wellbeing. In this section, we briefly review the evidence on the relation between educational attainment and poverty, fertility behavior, and child health and nutritional status.

Educational Attainment and Poverty. The recently completed World Bank (2004c) study on poverty in Ethiopia underscores that while many factors are involved in reducing poverty, education plays a key role. Table 6.10 shows, for example, that whereas the overall poverty rate is around 38 percent, the share of households living in poverty falls to 32 percent among those headed by someone with some primary education, and 21 and 9 percent, respectively, among those whose household heads have completed secondary and postsecondary education.

Table 6.10. Incidence of Poverty by Gender and Education of Household Head, Ethiopia, 1999

Characteristic of household head	Percentage living in poverty[a/]
Male	0.38
Female	0.37
Completed some primary education	0.32
Completed secondary	0.21
Completed postsecondary	0.09

a. Refers to share of households whose consumption expenditure (food and nonfood) per adult equivalent falls below a lower bound threshold estimated in World Bank 2004c; see World Bank 2004c, box 1.2, for more details on the estimation method.
Source: World Bank 2004c—table 1.8, which is based on data from the 1999 Ethiopia Household Income and Consumption Expenditure Survey.

Regression analysis confirms the positive impact of education on poverty reduction: on average, increasing a household head's schooling by one grade would raise the consumption expenditure per adult equivalent in male-headed households by around 1.6 percent, and in female-headed households by between 1.5 and 2.5 percent (Table 6.11). These impacts are of the same order of magnitude as the annual growth rate of Ethiopia's per capita GDP during the past 12 years. They imply that raising the average educational attainment of household heads by an extra year would boost consumption expenditure by roughly the same amount as a year of economic growth at its current pace. It is interesting to

Table 6.11. Regression Estimates of the Impact of Education on Poverty, Ethiopia, 1999

Indicator	Regression results: Sample mean	Regression results: Marginal impact of education	Simulated impact of endowing all adults with a grade 4 education (% change)
Consumption expenditure per adult equivalent, 1995–99 (Birr)	1,435		8
Mean years of schooling of adult males		1.5 to 1.6*	3
Mean years of schooling of adult females		1.5 to 2.5*	5
Probability of living in poverty, 1995–99 (percent)[a/]			
Men	38	n.a.	–6
Women	37	n.a.	–12
All adults	38	n.a.	–18

n.a. Not applicable.
*Coefficient estimate statistically significant at the 1 percent level.
a. Poor households are defined as those whose consumption expenditure (food and nonfood) per adult equivalent falls below a lower bound threshold estimated in World Bank 2004c (see box 1.2 for more details on the estimation method).
Source: Based on World Bank 2004c—tables 2.9, 2.10, and 2.14).

note that increases from even modest levels of educational attainment would achieve a large impact: an extra grade of primary schooling would expand household consumption expenditure in male-headed households by 1.4 percent compared with an increase of 1.8 percent associated with an extra grade of secondary schooling; and by the corresponding rates of 1.7 and 2.1 percent in female-headed households.[132] Simulations based on these regression estimates suggest that if all Ethiopian adults, men and women, received a grade 4 education, the overall poverty rate would fall by 18 percent. The reduction would be smaller, 12 percent, if only the women were so educated; it would be even smaller, 6 percent, if only the men attained this level.

Education and Fertility Behavior. Fertility behavior plays a major role in changing the size and structure of the population. According to a 2000 estimate, Ethiopian women of childbearing age average an estimated 5.9 births, which makes their total fertility rate one of the highest in the world today. As in many other Sub-Saharan African countries, female education in Ethiopia is inversely related to fertility (Table 6.12). Women with no education expect to average 6.2 live births each, compared with only three live births among women

132. Additional results show that female education generally reduces poverty to a greater extent in urban than in rural areas; in urban areas, its impact is about twice as large as that of male education. There are also important differences across regions: in Amhara and SNNPR, female education exerts a substantially larger impact than male education, whereas in Oromiya, the impacts are comparable; in Tigray, female education has, on average, no impact, while male education achieves a statistically significant, though quantitatively modest, impact.

Table 6.12. Fertility Rate and Number of Children Per Woman by Level of Education, Ethiopia, 2000

Educational attainment	Total fertility rate [a/]	Number of children ever born to women ages 15–49
No education	6.2	7.1
Primary education	5.1	5.9
Secondary and higher education	3.1	4.6
Overall average	5.9	7.0

a. Number of live births per woman between ages 15 and 49 given current age-specific rates of birth over this age span; refers to the rate for the five years preceding the survey in 2000.
Source: 2000 Ethiopia Demographic and Health Survey.

with at least some secondary education. Because of the higher fertility rates among the less-well-educated, these women are also at greater risk of increased maternal mortality.

Education and Child Health and Nutritional Status. Infant and child mortality rates in Ethiopia have been declining since the 1960s, but they remain high today: 97 children per 1,000 who are born die before their first birthday and 188, before their fifth birthday. According to the World Bank and Ministry of Health's 2004 country status report on health and poverty, mother's education is associated with health behaviors that affect the outcomes of children's health in important ways, including the intake of iodized salt and use of immunization vitamin A supplementation. According to regression analysis, an extra year of mother's schooling reduces the under five mortality rate by an estimated 16 deaths per 1,000 live births in rural areas, and by 6 deaths per 1,000 live births in urban areas—significant reductions from the current average of 188 deaths per 1,000 live births (Table 6.13).

Part of the association between mother's education and child health comes from its influence on children's nutritional status. Ethiopian children are generally at higher risk of malnutrition than other children in Sub-Saharan Africa: about 45 percent are underweight compared with the region's average of 33 percent during the 1990s. A study by Christiaensen and Alderman (2003) using data from the 1995, 1997, and 1998 Welfare Monitoring Surveys, as well as data from the 1998 Health and Nutrition Survey, confirms maternal education as a key determinant of chronic child malnutrition in Ethiopia: among children between age 3 and 60 months, each year of schooling of the most educated female in the household raises a child's height-for-age score by 0.03, all else being the same. It is noteworthy that the marginal impact is about twice as large as the corresponding impact for paternal education. The authors also show that the age-for-height score increases by an average of 0.23 points in households where the most educated woman has received postsecondary schooling relative to the score in other households. When thus defined, maternal and paternal education exert a comparable influence on child nutrition. Based on the regression results, the authors estimate that having at least one female adult per household attain primary education would reduce the incidence of stunting in Ethiopia by as much as 6 to 11 percent.

Table 6.13. Parental Education and Child Malnutrition, Ethiopia, 1995–98

Educational attainment of mother or adults in household	Marginal effect[a/] Nutritional status of children ages 3 to 60 months[b/]	Under five child mortality[c/] Rural	Urban
Mother's years of schooling		–0.016 ***	–0.006**
Females adults			
Years of schooling the most-educated woman has	0.031***	—	—
Most educated woman has postsecondary education	0.230*	—	—
Male adults			
Years of schooling the most-educated man has	0.016***	—	—
Most-educated man has postsecondary education	0.246***	—	—

—Not estimated in source.
*statistically significant at the 10 percent level.
**statistically significant at the 5 percent level.
***statistically significant at the 1 percent level.
a. Refers to the regression coefficient on the indicated education variable.
b. Measured in terms of height-for-age Z scores. The score is computed as (h-hr)/sdr, where h is the child's observed height, and hr and sdr are, respectively, the median height and the standard deviation in the population of children in the child's sex and age group.
c. Measured as the probability of a child death.
Source: or impact on child nutritional status, Christiaensen and Alderman 2003, Table 3; for impact on child mortality, World Bank 2004c, Table 4.5.

Issues for Policy Development

The evidence presented above raises issues for policy development from two perspectives—the long and short term. Ensuring that all Ethiopian citizens attain at least four years of schooling is essential for the country's long-term economic and social progress. Because it lays the foundation for not only raising productivity in agriculture and salaried employment, but also for reducing poverty and improving human welfare, this minimum investment in the country's human capital is arguably an immediate priority. Beyond this minimum, the main issue is to set a pace of expansion that is appropriate to the country. Two considerations are relevant in this regard: overly rapid expansion of postprimary levels of schooling may outstrip the economy's capacity to create jobs for the correspondingly large output of highly educated graduates that the system will produce; and it may divert public funds away from educational investments that need to be prioritized (for example, universalization of primary education). As a contribution to the discussion, we present below some information on the employment experience of recent graduates in the Ethiopian labor market; and estimates of the social returns to education.

Output of Graduates and Their Absorption into the Workforce. Although a full assessment would require more detailed data than were available for this report (such as tracer surveys that track recent graduates' transition from school to work), some insights nevertheless emerge from a review of unemployment among workers by age group. For example, secondary school graduates entering the workforce for the first time are likely to be concentrated among workers ages 20–24, while those with vocational and higher education are likely to be concentrated in the 25–29 age bracket. Thus, the incidence of unemployment among workers in these age groups can provide indirect evidence on the labor market absorption of graduates by educational attainment.

Table 6.14, which is based on the 2001 Ethiopia Stand-Alone Child Labor Force Survey, provides some interesting results in this regard. Unemployment in 2001 is more widespread among those with secondary education than among the lesser qualified, as well as among higher education graduates. Yet, the incidence of unemployment among recent labor market entrants (whose unemployment rates are denoted in the shaded cells in the table) is even higher, reaching 34 percent among graduates attaining grades 11–12, and 25 percent among those attaining grades 9–10, compared with about 9 percent among higher education graduates.[133] Among new workers with grades 5–8, the unemployment rate averages 10 percent, compared with just 4 percent among those with an attainment of only grades

Table 6.14. Unemployment Rate by Educational Attainment and Age, Ethiopia, 2001

Educational attainment	10–14	15–19	20–24	25–29	30–34	> 34	All ages
No schooling	1.6	5.8	5.3	4.7	4.7	3.6	3.7
	(14,250)	(7,116)	(6,587)	(6,078)	(4,426)	(20,030)	(58,487)
Primary							
Grades 1–4	4.4	5.1	5.4	2.8	3.5	2.9	4.3
Grades 5–8	6.7	9.6	11.0	7.0	4.5	5.8	7.8
Sub-total	4.7	6.9	8.2	5.0	4.0	4.3	5.7
	(4,355)	(5,133)	(3,965)	(3,438)	(2,122)	(4,366)	(23,379)
Secondary							
Grades 9–10	—	26.3	24.4	14.0	10.7	6.6	16.4
Grades 11–12	—	45.3	34.4	21.4	12.6	9.4	22.1
Sub-total	—	33.7	30.6	18.8	11.9	8.3	19.9
	—	(875)	(2,272)	(2,397)	(1,307)	(1,897)	(8,755)
Higher education	—	—	16.6	9.1	3.7	3.3	7.1
			(485)	(776)	(598)	(1,374)	(3,258)

— Too few observations to compute reliable rates of unemployment
Note: Shaded cells refer to the age groups where first-time entrants from each education category are concentrated. Number of observations in the sample in parentheses.
Source: Authors' estimates based on the 2001 ESACLFS.

133. Data from the 1999 Ethiopia Labor Force Survey show similar patterns of graduate unemployment. That survey indicate that unemployment rate among recent graduates of vocational and technical education is about 25 percent, compared with 44 percent among general secondary school graduates.

1–4. Taken as a whole, these results suggest that the most highly qualified workers—those with higher education—enjoy good employment prospects at present, whereas other educated workers, especially those with secondary schooling face substantially greater difficulty in landing their first job. While the situation may improve as the modern sector of the economy develops, these patterns caution against an overly ambitious plan for expanding postprimary education. Even for higher education, the favorable picture could well deteriorate as graduate output from the system rises (because of planned expansion of the system); jobs in government administration would then level off as vacancies associated with decentralization are filled and the pace of job creation in the private sector of the modern economy remains tepid.

The Social Returns to Education. These data provide another perspective for prioritizing public investments in education. Unlike the private returns to education presented earlier, the results shown in Table 6.15 refer to social rates which take into account both the private and public costs of education.[134] Because of data constraints, we apply the method only to the data for primary and secondary education. The results indicate that in urban areas, the social returns for grades 1–4, grades 5–8 and grades 9–12 are comparable, ranging from 11 to 13 percent a year. By contrast, in rural areas, the returns for grades 1–4 are much higher than in subsequent grades, averaging 20 percent a year com-

Table 6.15. Social Rates of Returns to Education in Ethiopia, 2001
(percent per year unless otherwise indicated)

Level of educational attainment	Average years of schooling	Urban[a/]	Rural[a/]
Grades 1–4	3.0	12	20
Grades 5–8	6.6	11	8
Grades 9–12	11.3	13	9

a. The returns are calculated, based on results from the Mincerian regressions reported in Appendix Table A6.2, as [(exp(bj–bi)–1]/([mj–mi] × k) where bj is the regression coefficient of the educational dummy variable j and mj is the corresponding average years of schooling, and k given by the ratio between the total cost of the average year of schooling (including direct costs and forgone earnings) and the forgone earnings from a full year of work had the person been in the labor market instead of at school. For estimating the private returns, the direct costs refer only to what the individual incurs, while for the social returns, it also includes what the government spends. For the purpose of these calculation we assume that students continue to be able to contribute to household production while in school: those in Grades 1–8 contribute an assumed 10 percent of their time to productive activities, while those in Grades 9–12 contribute 25 percent. The impact of these assumptions is to reduce the forgone cost of school participation and raise the returns by 1 to 2 percentage points compared to the results obtained when it is assumed that students make no contribution to work while enrolled. For further details on the method of estimation see Chiswick 1988.
Source: authors' calculations based on analysis of the 2001 ESACLFS.

134. See Chiswick 1998 for a detailed description of the method used here. In keeping with custom, the returns are called social returns even though the calculations ignore possible externalities associated with the various levels of education. Incorporating externalities in the calculation is often not attempted because of the difficulty of estimating them unambiguously and accurately.

pared with only 8 percent a year for grades 5–8 and 9 percent a year for grades 9–12. These patterns imply that expansion of Grades 1–4 in rural areas warrants particularly strong support; and that the case for expansion of subsequent levels is generally weaker, though less so in urban than in rural areas.

Conclusion

At the start of the 21st century, Ethiopia's population is among the least educated in the world, averaging fewer than two full years of formal schooling among the adults. Strengthening the country's human capital base to fuel its economic and social performance will require sustained investments in education. An important priority is to ensure that all Ethiopians acquire at least four years of primary schooling. Such a strategy can be expected to produce high social returns as well as boost social equity. Beyond this minimum target, additional investments will be required to help meet the expected increase in demand for educated labor as the economy expands and diversifies out of agriculture. What is at issue is the pace of expansion of the system beyond the first four years of primary schooling. In this regard, it is important to recognize that the demand for educated labor is a derived demand, one that is driven by how fast the modern sector of the economy grows. This sector has indeed been expanding in recent years in Ethiopia, but its growth has proceeded modestly. As a result, agriculture continues to dominate the economy with more than 80 percent of the workforce. Two other features of the labor market are also relevant: (a) most workers engage in self-employment or work as unpaid family labor; and (b) unemployment among recent labor market entrants, especially among the moderately well educated, is relatively high. Taken together, these characteristics suggest that while it makes good economic and social sense to universalize four years of primary schooling as soon as possible, the pace of expansion in subsequent grades may need to proceed in tandem with the economy's capacity to absorb well-educated graduates into jobs for which their training has prepared them.

APPENDIXES

TECHNICAL NOTE 1

Preparation of the Data on Current Public Expenditure on Education in Ethiopia

This note explains the preparation of the data reported in Chapters 1 and 3 on public current spending on education in Ethiopia. The main source of the aggregate expenditure data are the consolidated figures from the Ministry of Finance and Economic Development (MOFED).[135] These data are coded in sufficient detail to reveal broad categories of spending by level of education and function at the federal and regional levels. Yet because the reporting system has been evolving, no doubt reflecting the progress of efforts by the government to improve it, the reported aggregates sometimes suffer from changes in definitions, misclassifications, and periodic gaps in certain items of expenditure or in the reporting of regional spending. For the purpose of this report, an effort was therefore made to: (a) "clean" the reported MOFED data to ensure time-series consistency in the data underlying the aggregate amounts; and (b) for one year, 1994 E.C. (2001–02), to supplement and compare them with information on spending culled from other sources (especially the school census for that year and reports from specific institutions).[136] Below we provide details on how we have dealt with missing data, and how we have estimated items of spending needed to construct a more detailed picture of the composition of the government's recurrent spending on education.

135. Prior to 1986 E.C. (1993–94), current expenditures on education are based on the *Countrywide budgetary revenue and expenditure* data from the Ministry of Finance and Economic Development (MOFED). For subsequent years, the main source of data are MOFED's electronic budget data files.

136. Specifically, we used data from the Ministry of Education's School Census for 1994 E.C., and regional reports submitted to the Ministry on physical and financial performance in 1994 E.C. under the Education Sector Development Programme (ESDP); and data supplied by individual teacher training institutes (TTIs), teacher training colleges (TTCs), and other institutions of higher education.

General Definitions

Data for the period 1986–92 E.C. (1993–94 to 1999–2000) refer to actual current expenditures, while those for 1993 E.C. and 1994 E.C. refer to the voted budget. In Chapter 3 where detailed estimates of spending are made for 1994 E.C., aggregate spending on the salaries of teachers and administrative staff in primary and secondary schools refer to actual spending, based on data reported by each school through the school census; the same item for teacher training institutes, teacher training colleges, and institutions of higher education refer to estimates based on reports from individual institutions in the corresponding categories.[137]

To construct our time series on current spending on education, we make the following adjustments to the reported data available from MOFED: (a) we exclude spending on items that should in fact be classified as capital spending (for example, purchase of equipment and motor vehicles, and of materials for school construction; see Appendix Table A1.5 for the amounts excluded); and (b) we minimize double counting by excluding the amounts shown under "retained revenues" where these are likely to be transfers between spending units (for example, between regional governments and the National Organization of Examinations). Our calculations include grants to institutions and individuals, but exclude current spending financed by external sources of funding, the latter treatment necessitated by the incompleteness of data on external funding. Whenever possible, they exclude spending on noneducation services that are included in the reported budget data; the most important example is spending on Black Lion Hospital which appears under the budget for Addis Ababa University.

Economic Classification

Total current expenditures include spending on the following items:

- *Staff remuneration.* This item refers to the expenditure on the salaries, allowances, and pensions of teaching and nonteaching staff. The amounts for the latter two items are estimated from their proportionate share of the wage bill as reported in MOFED's data for the Ministry of Education.
- *Expenditures on contract and casual staff.* Note that the data are available only for 1994 E.C. and at the federal level.
- *Miscellaneous payment to staff.* The data are again available only for 1994 E.C. and at the federal level.
- *Education supplies.*
- *Foodstuff.*
- *Uniforms, clothing, and bedding.*
- *Grants to individuals.*
- *Other expenditure.* This category is defined as the difference between total current expenditure net of the spending on the items listed above.

137. Because of data constraints, the same approach could not be used to estimate the salary bill for technical and vocational education and training; for this subsector, the spending is thus simply the budgeted amount reported in MOFED's budget data files.

Functional Classification

The current expenditures detailed above are disaggregated along the following functional categories:

- *Administration.* Under this rubric are included expenditures on: (a) administrative and general services at both the federal and regional levels; (b) the National Organization of Examinations (or its predecessor organization, the Examination Agency) at the federal level; (c) the Higher Education Main Department (for 1986 E.C. only); and (d) the Curriculum and Supervision Institute (for 1986 E.C. and 1987 E.C. in Oromiya Region).
- *Primary education.* This item includes expenditures at the federal and regional levels on grades 1–8, as well as expenditures incurred by the Ethiopian Community School.
- *Secondary education.* In this category are expenditures at the federal and regional levels on grades 9–12, as well as expenditures incurred by the Bole Boarding School.
- *Technical and vocational education and training (TVET).* TVET expenditures include those at the federal and regional levels to provide technical and vocational training.
- *Teacher Training Institutes (TTIs).* Under TTIare expenditures on the institutes at Adwa, Arba Minch, Bonga, Hosana, Assela, Debre Berhan, Dessie, Gambella, Harar, Metu, Nekemte, Jijiga, and Robe; because some of these institutions were created only recently, the data naturally exclude them for the years preceding their establishment.
- *Teacher Training Colleges (TTC).* This item comprises expenditures of the colleges as Kotebe, Abi Adi, Awassa, Gondar, and Jimma. As with the TTIs, some of these colleges are new and the data naturally exclude them if the year in question precedes their date of creation.
- *Higher education.* Higher education expenditures refer to the following institutions: Addis Ababa Junior College of Commerce, Bahar Dar Polytechnic, Ambo Agricultural College, Jimma College of Agriculture, Addis Ababa University (excluding spending on Black Lion Hospital, which was reported only in 1994 E.C.), Mekele University College, Alamaya Agricultural College, Nazareth Technical Teachers Education College, Mekele Business College/Mekele University, Arba Minch Institute of Water Technology, Wondogonet College of Forestry, Jimma Health Science College/Jimma University, Awassa College of Agriculture, Bahir Dar Teacher Training College/Bahr Dar University, Gonder College of Medical Science, Dila Health and Education College, Ethiopian Civil Service College, Education Mass Media Training Institute, Art College (Tigray region). Due to lack of data, expenditure on Maichew Technical College (Tigray region) is excluded.
- *Other.* Under this rubric are included the expenditures of the following institutions: Educational Mass Media (federal and regional levels); adult education (federal and regional levels); kindergarten teacher training institutes (regional level); special education at the regional level; Study and Research Center (Amhara region); Adama Teacher Training College (for E.C. 1993 and 1994 only; Oromiya Region).

In order to fill gaps in the reported budget data, we took the following measures. The data for the National Organization of Examinations was completed with information supplied directly by the institution itself. The expenditures of the Teacher Training Institutes at Harari and Amhara, and of the Teacher Training Colleges at Abi Adi, Awassa, Gondar, Jimma, and Kotebe were missing for some years; in response to a request made in the context of the present study, the institutions supplied the information. The data for two regions, Benshangul-Gumuz and Gambella, proved particularly problematic. Reporting was incomplete; the data that were reported were presented in different formats over time and were aggregated in ways that made it difficult to prepare a complete time series with the same economic and functional classifications as for the other regions. For these two regions, only a functional breakdown was possible to construct for the period under analysis. For the years 1986 E.C. to 1988 E.C. (1993–94 to 1995–96), the budget data were complete and had the required format. For the other years, the data were pieced together as follows. For 1994 E.C. (2001–02), the functional breakdown was constructed from ad hoc information contained in each of the two regions' report on physical and financial performance under the Education Sector Development Programme (ESDP) for 1994 E.C. For the years 1989 E.C. to 1993 E.C. (1995–96 to 2001–02), the breakdown of spending was estimated using the following information: (a) the trend in total current expenditure between 1988 E.C. and 1994 E.C. (1994–95 to 2001–02); and (b) the trends in key cost-related education sector variables in the two regions (such as unit costs, pupil-teacher ratio, teacher-administrative staff ratio, and so on).

Detailed Estimates of the Composition of Spending in 1994 E.C. (2001–02)

To better understand the pattern of education spending, we made further estimates of the economic breakdown of spending by level and type of education, using the data for 1994 E.C., the most recent year for which the relevant data were available to us at the time of data analysis. The estimates pertain to expenditures at the federal and regional levels on the following: grades 1–4, grades 5–8, grades 9–12, TTI, TTC, and higher education. For the reasons explained above, we excluded Benshangul-Gumuz and Gambella from the exercise because of insurmountable data constraints. Our method involved combining budget data for nonsalary expenditures with estimates of staff remuneration based on data collected through the Ministry of Education's 1994 E.C. school census (for primary and secondary education) and on those collected (as part of this study) from the teacher training institutes and colleges and the various institutions of higher education. This approach implies that the spending on nonsalary items pertains to voted budget amounts, while the expenditure on staff salaries refers to the estimated actual spending.

Nonsalary Expenditures

For each level of education, expenditure on educational supplies, foodstuff, uniforms, clothing, and bedding, we took grants to individuals and others directly from the reported federal and regional budgets. For Addis Ababa, the breakdown of spending on grades 1–4 and grades 5–8 are not shown separately. We estimate the breakdown between these cycles by prorating the aggregate amount for grades 1–8 according to each cycle's share of total enrollments.

Wage Bill of Teaching and Nonteaching Staff in Grades 1–4, 5–8, and 9–12

The 1994 E.C. school census contains information for 11,444 schools (out of a total of some 12,000 schools nationwide) on the distribution of teachers assigned to teach in grades 1–4, 5–8, or 9–12 and, within each instructional cycle, the distribution of the teachers by salary range (see Table 17.2 of the school questionnaire). This information makes it possible to estimate the average remuneration of the teachers in each of the three instructional cycles.[138] For schools with missing data in the school census, we imputed the average salary of teachers at the school level by first estimating a regression equation relating the average remuneration of teachers to the vector of variables consisting of: (a) average of teachers' age; (b) teachers' age squared; (c) percentage of teachers by rank; and then using the regression equation to fill the wage data gaps. This approach failed in Somali, however, because none of the schools in this region were included in the school census. We thus made the assumption that the average wage of teachers in this region is the same as in Afar, the other region where teachers routinely receive hardship allowances. Once we have obtained estimates of the average wage of teachers assigned to each level of education, the desired aggregate wage bill by level of schooling in each region is obtained in two steps: (a) topping up the estimated average wages by payments for pensions (assumed to be the same percentage of the total wage bill as in the reported budget) and for allowances (which are reported as a lump sum in the budget for teaching and nonteaching staff, and which we split between the two categories according to their share of the wage bill); and (b) multiplying the result by the corresponding number of staff.

We estimated the salaries for nonteaching staff in a similar fashion. However, because administrative staff are allocated to schools and not to a particular subcycle within each school, we distributed the wage bill of these staff members in schools offering multiple cycles of instruction (those offering grades 1–8 and grades 1–12) across subcycles by prorating it according to the distribution of teachers assigned to each subcycle.

Teaching and Nonteaching Staff Remuneration in TTIs, TTCs, and Higher Education Institutions

We based our estimates on data supplied by each institution in response to a request made in the context of this study. Because the data were patchy, we made various assumptions to complete the gaps.

For TTIs, we used the data supplied by 6 of the 13 institutions (Abar Minch, Assela, Nekemte, Gambella, Harar, and Jijiga) to estimate the average wages of teachers and administrative staff in such institutions, and then applied the average to the staff in the remaining seven institutions with missing data. This approach does not take into account differences in staff qualification between the two sets of institutions.

138. The format of the school census questionnaire is such that teachers are counted in only one cycle of instruction, even if they have teaching duties in more than one cycle. However, because information is lacking on the number of teachers involved, it is impossible to adjust the estimates of average remuneration accordingly.

For TTCs, we first estimated the average salary of teachers by rank from the records of individual staff in Jimma TTC. We then made an adjustment to include payment of pension and allowances (by an amount suggested by the share of such items in the total wage bill reported in the MOFED budget), and multiplied the result by the total number of TTC teaching staff by rank as reported in the Ministry of Education's Statistical Abstract for 1994 E.C. For administrative staff in TTCs, we used a similar approach, but applied the average salary of staff by qualification observed in all institutions of higher education rather than in Jimma TTC alone. This broader data source is justified by the fact that whereas TTC teachers are not paid at the same rate as teachers in universities and other institutions of higher education, administrative staff tend to be.

For higher education, we obtained our estimates of the aggregate spending on staff remuneration as follows. For Addis Ababa University, the available data pertain to the individual staff, their assignment to teacher and nonteaching functions, and their salaries. This information allows us to obtain an aggregate of spending on teaching and nonteaching staff at this institution. For the other institutions of higher education, we first estimated the average remuneration of staff by qualification using the data from the Jimma University and the Abar Minch Institute, the only two institutions for which we have data on the rank of individual staff and their salary. We applied the average from these institutions to the number of staff by rank in the other institutions of higher education, and added the resulting wage bill estimate to the wage bills of Addis Ababa University, Jimma University, and Abar Minch Institute, thus obtaining the aggregate for higher education as a whole. From the data for Addis Ababa University, supplemented by data from the Ministry of Education on the amount of transfers to institutions to cover the cost of expatriate staff, we were also able to compute the average remuneration of expatriate teachers paid on local and international pay scales.

Estimating Student Flow Profiles

Below we elaborate on the three methods of estimation that were presented in the text: the pseudo-cohort method, the UNESCO reconstructed cohort method, and the composite cohort method.

The Basic Data

All three methods rely on the same basic data on enrollments and repeaters (Table T2.1). In Ethiopia, the authorities make a distinction between repeaters and readmitted students: the former are students who take and fail the year-end examination, and return to the same grade the next school year; readmitted students are those who drop out during the school year without taking the year-end examination and return to the same grade the next school year. The distinction supposedly allows educators to isolate two factors associated with grade repetition: inefficiencies in the teaching process itself, and demand-side constraints that result in students dropping out before the end of the school year; this in turn retards their learning and makes it necessary for them to repeat the grade. While the separation of the two types of students has its use, it is not relevant for the student flow calculations presented below. The two groups are thus combined into a single group, which for lack of a better term we also call repeaters, following standard education terminology. Treating readmitted students as repeaters is important to avoid serious underestimation of the cohort survival rates. Two other reasons make it important to combine the two groups of students into one. First, it renders Ethiopia's data comparable to those of other countries. Second, because the distinction between repeaters and readmitted students was made only from 1993 E.C. (school year 2000–01) onward, combining the two groups makes it possible to construct an internally consistent time series for Ethiopia as well.

Table T2.1. Number of Students and Repeaters, Girls and Boys, Ethiopia, 1992–93 to 2002–03

Item/grade	1992–93	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–2000	2000–01	2001–02	2002–03
Enrollments											
1	623,663	907,576	1,107,751	1,424,754	1,611,928	1,751,600	1,840,185	1,955,035	2,052,607	2,053,135	2,092,159
2	331,767	394,095	500,007	636,395	858,043	951,944	1,070,382	1,235,823	1,363,249	1,448,462	1,445,630
3	261,426	305,826	356,448	445,780	550,862	721,587	818,086	940,891	1,096,122	1,208,636	1,262,631
4	236,185	252,422	298,508	348,153	418,716	515,300	639,276	741,934	871,320	1,015,721	1,124,084
5	207,945	212,979	232,970	273,268	316,265	384,756	466,222	576,199	673,280	786,058	902,320
6	194,908	210,741	226,508	251,718	249,894	282,546	333,431	397,377	497,980	580,773	667,612
7	184,660	178,225	188,129	218,552	255,394	264,518	299,355	346,831	419,904	537,454	633,588
8	164,143	179,203	188,101	189,299	207,192	218,419	235,296	268,413	299,659	352,521	444,291
9	120,144	134,778	151,028	167,000	172,453	191,408	210,375	211,278	265,664	312,058	354,965
10	88,234	87,097	93,525	103,516	110,176	116,479	135,035	156,103	112,463	156,088	193,108
11	86,562	75,709	77,036	84,352	91,396	103,772	111,790	131,598	175,712	32,953	49,965
12	68,746	59,611	49,327	47,885	52,470	56,010	64,528	72,740	95,382	183,531	28,676
Gr. 1–12	2,568,383	2,998,262	3,469,338	4,190,672	4,894,789	5,558,339	6,223,961	7,034,222	7,923,342	8,667,390	9,199,029

Repeaters & readmitted[a/]											
1	—	95,804	126,234	197,054	192,952	269,676	303,256	356,938	374,769	387,191	391,140
2	—	28,871	29,539	41,693	44,644	77,770	94,465	131,628	161,220	186,698	203,655
3	—	18,069	16,912	20,580	20,208	30,563	59,191	91,606	117,830	141,028	159,165
4	—	19,794	21,765	25,353	23,823	31,824	39,807	74,760	106,089	129,413	163,063
5	—	12,801	13,551	14,029	18,097	26,255	33,128	60,554	83,959	98,164	124,711
6	—	21,516	28,791	29,583	14,039	14,444	16,252	31,542	44,402	53,774	67,005
7	—	23,108	26,222	33,405	33,860	41,743	43,025	58,807	76,940	97,077	121,555
8	—	34,904	43,460	42,965	44,192	38,992	48,400	57,879	62,389	63,661	77,885
9	—	25,743	30,208	36,855	43,550	40,020	44,400	56,214	77,756	80,208	91,492
10	—	14,466	16,025	17,527	19,948	19,784	18,361	28,402	15,050	5,762	6,069
11	—	13,223	14,927	16,972	17,719	20,604	26,303	30,032	33,419	201	903
12	—	0	595	0	0	0	0	2,207	8,136	4,166	36
Gr. 1–12	—	308,299	368,229	476,016	473,032	611,675	726,588	980,569	1,161,959	1,247,343	1,406,679

—Data not available.

Note: Data include students in government and nongovernment schools in regular programs only (i.e., they exclude evening students); data for grades 11–12 for 2000–01 and 2001–02 show unusual trends. The number of grade 12 repeaters in 2001–02 is probably inaccurate, being inconsistent with the number reported in grade 11 in 2000–01 and in grade 12 in 2001–02. The inconsistency is being checked by the authorities at the time of report writing.

a. Readmitted students refer to students who dropped out before the end of a school year and returned the next year. Separate data on repeaters and readmitted students available only from 1993 E.C. [or 2000–01] onward.

Source: Govt. of Ethiopia 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002; and UNESCO for data on repeaters for 1993–94 to 1996–97.

Pseudo-Cohort Method

True cohort survival rates can only be computed from data for an actual cohort whose year-to-year or grade-to-grade progression is traced. Because we only have cross-sectional data at our disposal, our calculations are an approximation of the true pattern, yielding what we call pseudo-cohort survival rates. Table T2.2 shows the data on nonrepeaters that are used in the calculation. For pupils entering grade 1 for the first time in 1994–95, we could compute the pseudo-survival rate to grade 8 by dividing the number of nonrepeaters in grade 8 in 2001–02 (288,860) by the number of nonrepeaters in grade 1 in 1994–95 (981,517)—which yields 29.4 percent. The result is inaccurate to the extent that the non-repeaters in 2001–02 are unlikely to be the same group as the new grade 1 entrants in 1994–95. The former group will inevitably include many who entered grade 1 in years prior to 1994–95 and were straggling along and by chance found themselves in grade 8 in 2000–01; and it will exclude the new first-graders starting in 1994–95 who have yet to reach grade 8 in 2001–02 because of grade repetition.

The longer is the distance between the two years to which the calculation refers, the fewer the number of pupils in the two years who belong to the same cohort, and the less the result will resemble a pseudo-cohort survival rate. One way to reduce the distortion is to take a shorter time span of, say, four years (which conveniently matches perfectly the current structure of the Ethiopian education system). In the table above, the shaded cells exemplify the calculations of pseudo-cohort survival rates: for 1993–94, the survival rate from grade 1 to grade 4 is 48.6 percent (=394,893/811,772), and for 1997–98, the survival rate from grade 5 to grade 8 is 81.4 percent (=237,270/358,501). Table T2.3 shows the result of applying this algorithm to the rest of the data. Note that the pseudo-cohort survival rates can only be computed up to 1999–2000 because the first-graders, fourth-graders, and ninth-graders in subsequent years have yet to reach the corresponding end grades in 2002–03, the last year for which data are available at time of data analysis.

UNESCO Reconstructed-Cohort Method

To make the calculations more up-to-date, educators have developed other methods to compute cohort survival rates. We explain here the UNESCO reconstructed-cohort method. The Ethiopian Ministry of Education also reports this calculation in its annual statistical abstract, but the calculations do not count readmitted students as repeaters (effectively treating them as dropouts), thus underestimating the survival rates. Here we replicate the calculations counting readmitted students as repeaters, and examine as well the implications of two alternative assumptions about repetition behavior.

Computing the Repetition, Promotion, and Dropout Rates

The first step is to compute these rates based on data for enrollment and repeaters in two consecutive years. Table T2.4 illustrates the calculation with data for 1992–93 and 1993–94. In 1992–93, 623,366 pupils were in grade 1; in 1993–94, 394,095 pupils were in grade 2. Because in 1993–94 there were there were 95,804 repeaters in first grade and 28,871

Table T2.2. Number of Nonrepeaters, Boys and Girls, Ethiopia, 1993–94 to 2002–03

Grade	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–2000	2000–01	2001–02	2002–03
1	811,772	981,517	1,227,700	1,418,976	1,481,924	1,536,929	1,598,097	1,677,838	1,665,944	1,701,019
2	365,224	470,468	594,702	813,399	874,174	975,917	1,104,195	1,202,029	1,261,764	1,241,975
3	287,757	339,536	425,200	530,654	691,024	758,895	849,285	978,292	1,067,608	1,103,466
4	232,628	276,743	322,800	394,893	483,476	599,469	667,174	765,231	886,308	961,021
5	200,178	219,419	259,239	298,168	358,501	433,094	515,645	589,321	687,894	777,609
6	189,225	197,717	222,135	235,855	268,102	317,179	365,835	453,578	526,999	600,607
7	155,117	161,907	185,147	221,534	222,775	256,330	288,024	342,964	440,377	512,033
8	144,299	144,641	146,334	163,000	179,427	186,896	210,534	237,270	288,860	366,406
9	109,035	120,820	130,145	128,903	151,388	165,975	155,064	187,908	231,850	263,473
10	72,631	77,500	85,989	90,228	96,695	116,674	127,701	97,413	150,326	187,039
11	62,486	62,109	67,380	73,677	83,168	85,487	101,566	142,293	32,752	49,062
12	59,611	48,732	47,885	52,470	56,010	64,528	70,533	87,246	179,365	28,640

Note: Shaded cells contain the data used in the discussion of an example in the text.
Source: computed from data in Table T2.1 by subtracting repeaters (including readmitted students) from total enrollments.

Table T2.3. Pseudo-Cohort Survival Rates, Ethiopia, 1993–94 to 1999–2000

Year when cohort started in the cycle	Percentage of cohort surviving to end of cycle		
	Grades 1 to 4	Grades 5 to 8	Grades 9 to 12
1993–94	48.6	81.4	48.1
1994–95	49.3	81.8	46.4
1995–96	48.8	72.1	49.6
1996–97	47.0	70.6	54.7
1997–98	51.6	66.2	57.6
1998–99	57.7	66.7	[a]
1999–2000	60.1	71.1	18.5[b]

a. The available data imply a rate of 108.1 percent, which is impossible by definition. The result signals probable inaccuracies that have arisen in the counts of repeaters and readmitted students as the new policy was implemented, beginning in 2001–02, to restrict entry to grades 11 and 12.
b. The drastic decline in survival between grades 9 and 12 reflects the impact of the new policy noted in footnote a.
Source: Computed from data in Table T2.2; see main text for further details.

repeaters in second grade, it can be deduced that of the 623,366 first-graders in 1992–93, 365,224 advanced to grade 2 (= 394,095 – 28,871); and 162,635 dropped out (= 623,663 – 365,224 – 95,805).

The repetition, promotion, and dropout rates in grade 1 are therefore as follows:

- Repetition rate = 0.154 (= 95,804/623,663)
- Promotion rate = 0.586 (= 365,224/623,663)
- Dropout rate = 0.261 (= 162,635/623,663)

Table T2.5 shows these rates for each grade, each year since 1993–94; this is the first year that data are available both on total enrollments and the number of repeaters among them.

Table T2.4. Example Calculation of Promotion, Repetition, and Dropout Rates

Enrollment (Boys and Girls)		
Grades	1992–93	1993–94
Grade 1	623663	907576
Grade 2	331767	394095

Repeaters (Boys and Girls)	
Grades	1993–94
Grade 1	95804
Grade 2	28871

Source: Authors' construction.

Setting Up the Calculations

Once the repetition, promotion, and dropout rates have been computed, they can be set up as in Figure T2.1 to reconstruct a cohort's movement from grade to grade in each year. Suppose 1,000 students enroll in grade 1 in 1999–2000. Using the grade-specific flow rates computed for 2000–01 (as reported in the previous table), we would expect 192 pupils to repeat grade 1 the next

Table T2.5. Promotion, Repetition, Dropout Rates, Ethiopia, 1993–94 to 2001–02

Indicator & grade	1992–93	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–2000	2000–01	2001–02
Promotion rate										
1	0.586	0.518	0.537	0.571	0.542	0.557	0.600	0.615	0.615	0.605
2	0.867	0.862	0.850	0.834	0.805	0.797	0.793	0.792	0.783	0.762
3	0.890	0.905	0.906	0.886	0.878	0.831	0.816	0.813	0.809	0.795
4	0.848	0.869	0.868	0.856	0.856	0.840	0.807	0.794	0.789	0.766
5	0.910	0.928	0.953	0.863	0.848	0.824	0.785	0.787	0.783	0.764
6	0.796	0.768	0.817	0.880	0.891	0.907	0.864	0.863	0.884	0.882
7	0.781	0.812	0.778	0.746	0.703	0.707	0.703	0.684	0.688	0.682
8	0.664	0.674	0.692	0.681	0.731	0.760	0.659	0.700	0.774	0.747
9	0.605	0.575	0.569	0.540	0.561	0.610	0.607	0.461	0.566	0.599
10	0.708	0.713	0.720	0.712	0.755	0.734	0.752	0.912	0.291	0.314
11	0.689	0.644	0.622	0.622	0.613	0.622	0.631	0.663	1.021	0.869
12[a/]										
Repetition rate										
1	0.154	0.139	0.178	0.135	0.167	0.173	0.194	0.192	0.189	0.191
2	0.087	0.075	0.083	0.070	0.091	0.099	0.123	0.130	0.137	0.141
3	0.069	0.055	0.058	0.045	0.055	0.082	0.112	0.125	0.129	0.132
4	0.084	0.086	0.085	0.068	0.076	0.077	0.117	0.143	0.149	0.161
5	0.062	0.064	0.060	0.066	0.083	0.086	0.130	0.146	0.146	0.159
6	0.110	0.137	0.131	0.056	0.058	0.058	0.095	0.112	0.108	0.115
7	0.125	0.147	0.178	0.155	0.163	0.163	0.196	0.222	0.231	0.226
8	0.213	0.243	0.228	0.233	0.188	0.222	0.246	0.232	0.212	0.221
9	0.214	0.224	0.244	0.261	0.232	0.232	0.267	0.368	0.302	0.293

(continued)

Table T2.5. Promotion, Repetition, Dropout Rates, Ethiopia, 1993–94 to 2001–02 (*Continued*)

Indicator & grade	1992–93	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–2000	2000–01	2001–02
10	0.164	0.184	0.187	0.193	0.180	0.158	0.210	0.096	0.051	0.039
11	0.153	0.197	0.220	0.210	0.225	0.253	0.269	0.254	0.001	0.027
12	0.000	0.010	0.000	0.000	0.000	0.000	0.034	0.112	0.044	0.000
Dropout rate										
1	0.261	0.343	0.285	0.294	0.290	0.270	0.206	0.193	0.197	0.205
2	0.046	0.063	0.066	0.096	0.104	0.104	0.084	0.078	0.080	0.098
3	0.041	0.040	0.037	0.069	0.067	0.087	0.072	0.061	0.063	0.073
4	0.069	0.045	0.047	0.075	0.068	0.082	0.076	0.063	0.062	0.074
5	0.028	0.008	–0.014	0.071	0.069	0.090	0.085	0.067	0.071	0.077
6	0.094	0.095	0.052	0.064	0.051	0.035	0.042	0.025	0.008	0.003
7	0.093	0.041	0.045	0.099	0.134	0.131	0.100	0.094	0.081	0.092
8	0.123	0.083	0.080	0.086	0.081	0.019	0.095	0.067	0.014	0.032
9	0.181	0.201	0.187	0.199	0.207	0.158	0.126	0.171	0.132	0.107
10	0.128	0.103	0.092	0.096	0.066	0.108	0.038	–0.008[b/]	0.658	0.647
11	0.159	0.159	0.158	0.168	0.162	0.125	0.100	0.083	–0.022[b/]	0.103
12[a/]										

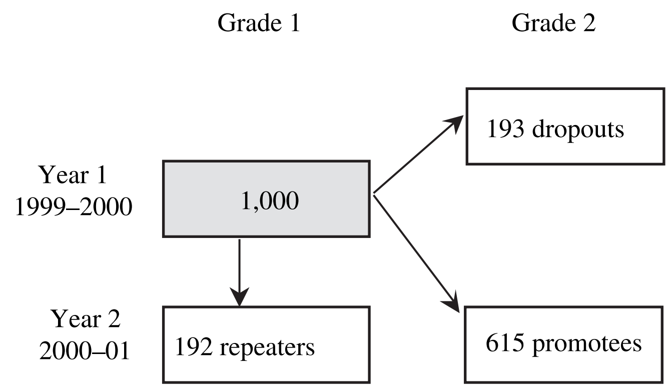
Note: Data refer to the promotion, repetition, and dropout rates between the year in each column and the following year. Shaded cells highlight the impact of the new policy beginning in 2001–02 to regulate student flow at grade 10.

a. Data unavailable on transition to postsecondary education, making it impossible to distinguish between those who stop after grade 12 and those who go on to higher education.

b. The two negative entries, for grade 11 in 2002–01 and grade 12 in 2001–02, are an indication of underlying inaccuracies in the data on repeaters and readmitted. Coincidentally, a new policy was being implemented that year that radically reduced access to grade 11 and 12.

Source: Computed from data in Table T2.1.

Figure T2.1. Example Calculation in the Reconstructed-Cohort Method



Source: Authors' construction, based on data for Grade 1 in 2000–01.

school year, 615 pupils to advance to grade 2 the next school year, and 193 pupils to drop out.

In 2000–01, of the 192 repeaters in grade 1, we would expect 37 (= 192 × 0.192) to repeat grade 1 in 2001–02, 118 (= 192 × 0.615) to advance to grade 2, and 37 (= 192 × 0.193) to drop out. In 2000–01, there would be 615 grade 2 pupils—those who advanced from grade 1 in 1999–2000. Of these we would expect 80 (= 615 × 0.130) to repeat the grade in 2001–02, 487 (= 615 × 0.792) to advance to grade 3 in 2001–02, and 48 (= 615 × 0.078) to drop out. The calculations are repeated in a similar way in subsequent grades and years to yield a complete picture of the student flow by grade through the system.

The Results Using the Classical Algorithm

The classical calculation calls for the foregoing algorithm to be repeated as many years as are needed for members of the initial cohort to exit the grade, either through promotion to the next grade or through dropping out. Figure T2.2 summarizes the result of the calculations. The last row shows the pattern of cohort survival: of the 1,000 entrants to grade 1, the number who eventually reach grade 2 is simply the sum of pupils promoted from grade 1 to grade 2 in the four years it took for everyone in the cohort to pass out of grade 1, which is 761 (= 615 + 118 + 23 + 4 + 1). Expressed as a percentage of the 1,000 pupils in the initial cohort, the survival rate would thus be 0.761 percent. The survival rates to grade 4 are 0.644 percent, and to grade 8 are 0.469 percent.

The Results with a Modified Algorithm

The Ethiopian Ministry of Education uses a modified approach to compute survival rates. In particular, the repetition algorithm is applied only twice in each grade, and students who

Figure T2.2. Computing Survival Rates Using the UNESCO Reconstructed-Cohort Method with Repetition Algorithm Applied until All Repeaters in Each Grade Exit the System

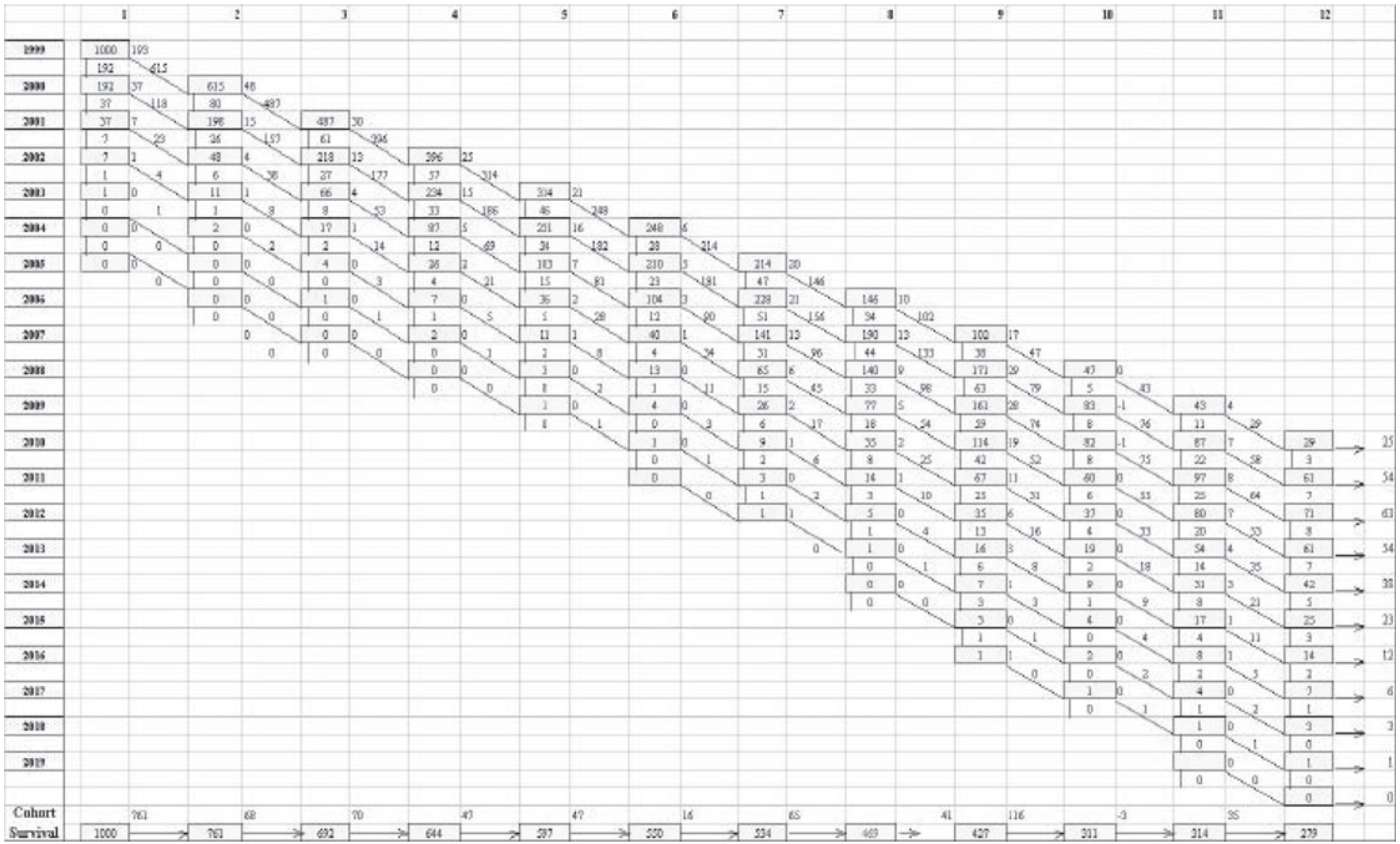
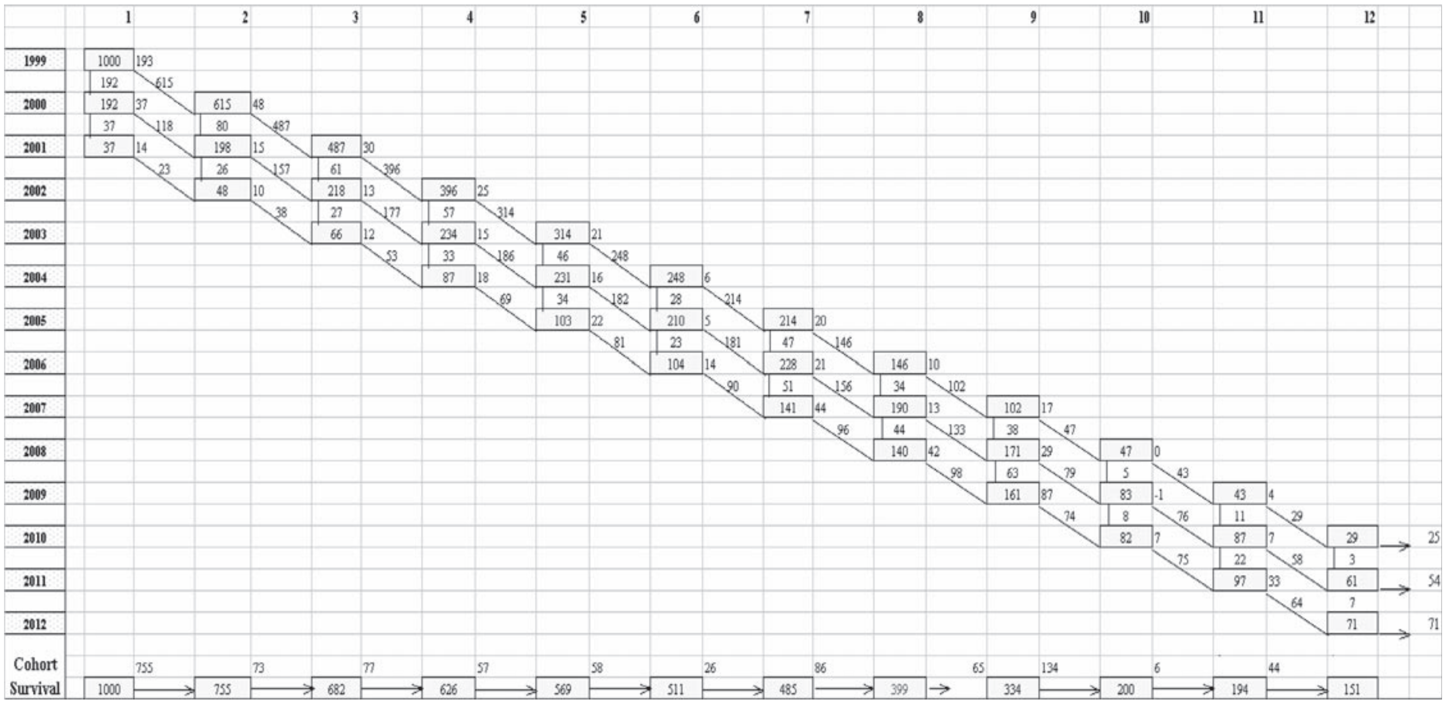


Figure T2.3. Computing Survival Rates Using the UNESCO Reconstructed-Cohort Method with Repetition Algorithm Applied Only Twice Per Grade



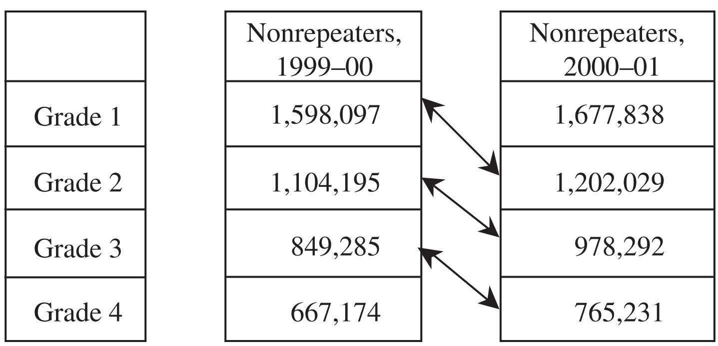
Note: Repeaters still left are thus treated as dropouts in this calculation.

have not been promoted at that point are treated as dropouts. Although this calculation departs from the logic of the reconstructed method, it is viewed as being more realistic given the current rule that allows children to repeat the same grade no more than twice. Figure T2.3 shows the adjusted calculations; these are the same as those reported in the Ministry of Education's annual statistical abstract, with the exception that readmitted students are treated as repeaters rather than as dropouts.[139] Strictly speaking, we would more properly describe this approach as a simulation rather than a reconstruction of student flow. As expected, the simulation yields an appreciably lower survival rate: 0.626 instead of 0.644 from grade 1 to grade 4; and 0.399 instead of 0.469 from grade 1 to grade 8.

Composite Cohort Method

The idea behind this method is simple. Using data on nonrepeaters from two adjacent years, we compute the proportion of pupils in one grade that advances to the next grade. In Figure T2.4, the survival rate from grade 1 to grade 2 is 0.752 (=1,202,029/1,598,097), and that from grade 2 to grade 3 is 0.889 (=978,292/1,104,195). The cohort survival rate from grade 1 to grade 3 would then simply be the result of multiplying the two grade-to-grade survival rates: 0.669. By computing the survival rates for all adjacent pairs of grades, we can compute the survival rates from grade 1 to any subsequent grade. Table T2.5 shows the data and the results based on them.

Figure T2.4. Example Calculation in the Composite Cohort Method



Source: Authors' construction based on data in table A2.2.

139. For this reason, the results show a survival rate of 0.399 instead of the much smaller value of 0.275 reported in the Ministry of Education's 2001–02 Annual Statistical Abstract.

Table T2.6. Number of Nonrepeaters, Boys and Girls, Ethiopia, 1993–94 to 2002–03

Indicator	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–2000	2000–01	2001–02	2002–03
Number of non repeaters										
Grade 1	811,772	981,517	1,227,700	1,418,976	1,481,924	1,536,929	1,598,097	1,677,838	1,665,944	1,701,019
Grade 2	365,224	470,468	594,702	813,399	874,174	975,917	1,104,195	1,202,029	1,261,764	1,241,975
Grade 3	287,757	339,536	425,200	530,654	691,024	758,895	849,285	978,292	1,067,608	1,103,466
Grade 4	232,628	276,743	322,800	394,893	483,476	599,469	667,174	765,231	886,308	961,021
Grade 5	200,178	219,419	259,239	298,168	358,501	433,094	515,645	589,321	687,894	777,609
Grade 6	189,225	197,717	222,135	235,855	268,102	317,179	365,835	453,578	526,999	600,607
Grade 7	155,117	161,907	185,147	221,534	222,775	256,330	288,024	342,964	440,377	512,033
Grade 8	144,299	144,641	146,334	163,000	179,427	186,896	210,534	237,270	288,860	366,406
Grade 9	109,035	120,820	130,145	128,903	151,388	165,975	155,064	187,908	231,850	263,473
Grade 10	72,631	77,500	85,989	90,228	96,695	116,674	127,701	97,413	150,326	187,039
Grade 11	62,486	62,109	67,380	73,677	83,168	85,487	101,566	142,293	32,752	49,062
Grade 12	59,611	48,732	47,885	52,470	56,010	64,528	70,533	87,246	179,365	28,640
Grade-to-grade survival rates[a/]										
Grade 1–2	—	0.580	0.606	0.663	0.616	0.659	0.718	0.752	0.752	0.746
Grade 2–3	—	0.930	0.904	0.892	0.850	0.868	0.870	0.886	0.888	0.875
Grade 3–4	—	0.962	0.951	0.929	0.911	0.868	0.879	0.901	0.906	0.900
Grade 4–5	—	**0.943**	**0.937**	**0.924**	**0.908**	**0.896**	**0.860**	**0.883**	**0.899**	**0.877**
Grade 5–6	—	0.988	1.012	0.910	0.899	0.885	0.845	0.880	0.894	0.873
Grade 6–7	—	0.856	0.936	0.997	0.945	0.956	0.908	0.937	0.971	0.972
Grade 7–8	—	0.932	0.904	0.880	0.810	0.839	0.821	0.824	0.842	0.832
Grade 8–9	—	**0.837**	**0.900**	**0.881**	**0.929**	**0.925**	**0.830**	**0.893**	**0.977**	**0.912**
Grade 9–10	—	0.711	0.712	0.693	0.750	0.771	0.769	0.628	0.800	0.807

(*continued*)

Table T2.6. Number of Nonrepeaters, Boys and Girls, Ethiopia, 1993–94 to 2002–03 (*Continued*)

Indicator	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–2000	2000–01	2001–02	2002–03
Grade 10–11	—	**0.855**	**0.869**	**0.857**	0.922	**0.884**	**0.871**	**1.114**	**0.336**	**0.326**
Grade 11–12	—	0.780	0.771	0.779	0.760	0.776	0.825	0.859	1.261	0.874
Composite cohort survival rates from grade 1 to:[a/]										
Grade 1	—	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Grade 2	—	0.580	0.606	0.663	0.616	0.659	0.718	0.752	0.752	0.746
Grade 3	—	0.539	0.548	0.591	0.523	0.572	0.625	0.666	0.668	0.652
Grade 4	—	0.518	0.521	0.549	0.477	0.496	0.550	0.600	0.605	0.587
Grade 5	—	0.489	0.488	0.507	0.433	0.444	0.473	0.530	0.544	0.515
Grade 6	—	0.483	0.494	0.461	0.389	0.393	0.399	0.467	0.486	0.450
Grade 7	—	0.413	0.462	0.460	0.368	0.376	0.363	0.437	0.472	0.437
Grade 8	—	0.385	0.418	0.405	0.298	0.315	0.298	0.360	0.398	0.363
Grade 9	—	0.322	0.376	0.357	0.277	0.292	0.247	0.322	0.389	0.331
Grade 10	—	0.229	0.268	0.247	0.207	0.225	0.190	0.202	0.311	0.267
Grade 11	—	0.196	0.233	0.212	0.191	0.199	0.166	0.225	0.105	0.087
Grade 12	—	0.153	0.179	0.165	0.145	0.154	0.137	0.193	0.132	0.076

—Data on survival rates not computed for lack of data on enrollments and repeaters for 1992–3

Note: Figures in bold font refer to transition rates between cycles; shaded cells signal probable errors in the counts of repeaters (including readmitted students) since transition rates by definition cannot exceed unity. As indicated in Table T2.4, the inaccuracy is probably associated with introduction of a new policy in 2001–02 to regulate student flow after grade 10.

a. Estimates reflect student flow among students enrolled in the preceding year.

Source: Data in first block, Table T2.2; the other two blocks, computed from data in the first block.

TECHNICAL NOTE 3

Selected Studies on Rates of Return to Education in Ethiopia

We focus on the seven studies published since 1990 that we have been able to access. Using data for 2000, we complement the studies' findings with our own estimates of the returns to education in Ethiopia. In brief, most of the studies, including our own, suffer from serious data and other shortcomings, which makes it difficult to place a high degree of confidence in many of reported results. Below we provide a short review of the studies and summarize what are, in our view, the most meaningful estimates as of this writing on the rates of return to education in Ethiopia.

An Overview of Seven Studies

The seven studies and our estimate are listed in Table T3.1, along with selected details about each study and the underlying database, as well as the corresponding regression model specification and coefficient estimate on the education variables. Following is a brief comment on each study.

Study No. 1: Krishnan (undated). The results refer only to young people ages 15–29 in urban areas. Because the data are for 1990, the last year of the Marxist regime, the results may no longer be relevant in the country's current economic context. Although separate estimates of returns are made by gender and sector of employment, the very small sample sizes—ranging from 59 to 213 observations, depending on gender and sector—are a serious drawback, one that considerably weakens the reliability of the results.

Study No. 2: Verwimp (1996). The results are based on a small sample of 422 male wage earners employed in the public and private sectors in 1994. An extra year of schooling yields an estimated return of 15 percent.

Table T3.1. Selected Studies on the Returns to Education in Ethiopia

Study no.	Author	Sample date	Sample size	Sample characteristics	Sector	Sex	Average of years of schooling in the sample	Coefficients in the semilog earnings models: Years of schooling	Primary	Secondary	Junior secondary	Senior secondary	Higher education	Diploma & Certificate	Above diploma
1	Krishnan (undated)[a]	1990	275 men & 272 women	Young people aged 15–29 from the Survey of Adolescent Fertility, Reproductive Behavior and Employment Status of the youth population of urban Ethiopia	Public & private separately	Male & female separately	?	Ma.Pu Ma.Pr Fe. Pu Fe. Pr	0.551 –0.534* –0.209 0.318		–0.607* 0.973*** 0.386** 0.560	0.475*** 0.263 0.737*** –0.277			
2	Verwimp (1996)	1994?	422	Ethiopian Rural Household Survey	Public & private	Male	?	0.15***	—	—	—	—	—	—	—
3	Zinash (2001)[b]	1994?	550	Ethiopian Urban Household Survey	?	?	?	?	n.s.	signif.			signif.		
4	Mengistae (1998)[c]	1994	1,170	Full-time wage employees	Public & private separately	Male & female	Pu=10.3 Pr=9.2	Pu= 0.085*** Pr= 0.074***	—	—	—	—	—	—	—
5	Wolday (1997)[d]	1996	Pu=843 Pr=170	Wage earners in one state-owned enterprise (Edget Cotton Factory) & in one private enterprise (MOENCO)	Public & private separately	Male & female	?	Pu= 0.05*** Pr= 0.08***	0.195*** — 0.656***	—	0.305*** –0.416**	0.409*** 0.235	—	0.774*** 0.166	1.003*** 0.177***

6	World Bank (1998)[e]	1996	1,474	Household heads in single-wage-earner households with positive labor market earnings, aged 15–64. (from HICES/WMS)	Public, private, formal, and informal	Male & female	3.8	0.231***	0.742***	2.196***		—	3.261***	—	—
7	Krishnan, Selassie & Dercon (1998)[f]	1997	MaPu=336 MaPr=249 FePu=248 FePr=125	Ethiopian Urban Household Survey; samples of men and women aged 15–64	Public & private separately	Male & female separately	LP=20; 37 P=23; 36 S=26; 18 H=31; 10	Ma.Pu Ma.Pr Fe. Pu Fe. Pr	0.276*** 0.047 –0.032 0.012	0.746*** 0.552** 0.186 0.995**			1.219*** 1.172*** 0.761 1.313**		
8	Our estimates	2000	1,024	Household heads in single-wage-earner households with positive labor market earnings, aged 15–64. (from HICES/WMS)	Public, private, formal, and informal	Male & female	3.5	15.6	—	—	—	—	—	—	—

— Not applicable.
?Source information is uncertain.
*Significant at 10%.
**Significant at 5%.
***Significant at 1%.
a. Coefficients of education dummies: Ma.Pu=Male Public sector; Ma.Pr=Male Private sector; Fe.Pu=Female Public sector; FE.Pr=Female Private sector.
b. Our information is from Mulat Demeke 2003.
c. Coefficient of year of schooling: Pu=Public sector worker; Pr=Private sector worker.
d. Sample size: Pu= number of observations in the public sector; Pr= number of observations in the private sector. Coefficient of years of schooling: Pu= coefficient for public sector; Pr=coefficient for private sector; Education dummies= first row for public sector; second row for private sector.
e. Coefficients of education dummies are for men only.
f. Sample size and coefficients of education dummies: Ma.Pu=Male Public sector; Ma.Pr=Male Private sector; Fe.Pu=Female Public sector; FE.Pr=Female Private sector.; the cell "Average of years of schooling" shows the percentage of male workers in public (1st figure) and private (2nd figure) with less than primary education (LP), primary completed (P), secondary completed (S) and tertiary education completed (H).
Source: As indicated in "author" column.

Study No. 3: Zinash (2001). The data are undated but probably refer to 1994. They pertain to a small sample of 550 wage earners in urban areas. The coefficient estimate for primary education was not statistically significant; those for secondary and tertiary education have the expected positive sign. The magnitude of the returns to these two levels of education is not documented, however, in the version of the paper to which we had access.

Study No. 4: Mengistae (1998). The data pertain to 1994 and relate to a sample of 1,170 full-time male and female employees of public agencies or private firms in major towns. However, the sample is unlikely to be a representative sample of Ethiopian workers in the formal and informal wage sector since the mean years of schooling in the sample were about ten years. According to this study, an additional year of schooling yields, on average, a private return of 8.5 percent a year in the public sector and 7.4 percent in the private sector. These figures are probably good estimates of the returns to education in the formal sector.

Study No. 5: Wolday (1997). The study relies on data for 1996 for 843 workers in a state-owned enterprise (Edget Cotton Factory) and 170 workers in a formal sector private enterprise (MOENCO). According to this study, an additional year of schooling yields, on average, a return of 5 percent in the public sector and 8 percent in the private sector. Note that these results stand in contrast to those reported in Study No. 4 above, which finds that the returns to education are comparable in both sectors—8.5 and 7.4 percent a year, respectively. For employees in the state-owned firm, the study estimates a return of 3.3 percent for primary education, 5.5 percent for junior secondary education, and 2.8 percent for senior secondary education; in contrast to these low numbers, the returns soar to 18 percent for diploma holders and 11.3 percent for those qualified beyond the diploma level.[140]

Study No. 6: World Bank (1998). The study uses data from the 1995/96 Ethiopia Household Income and Consumption Expenditure Survey. It restricts the observations to a subsample of households that have sole wage earners ages 15 to 65 who reported positive labor market earnings. The resulting subsample is thus highly restricted and is in no way representative of the population. This study finds that an additional year of schooling yields a return of 23 percent a year, which is very high compared with estimates reported in the other studies (for example, Studies No. 4 and 5 report returns ranging between 5.0 and 8.5 percent a year). The wage specification involving dummy variables for education (estimated only for males) also implies very high returns by level of education: 37 percent a year for primary education, 55 percent for secondary education, and 48 percent for higher education.[141] These magnitudes are sufficiently out of line with most of the results in the other studies as to raise doubts about their reliability.

Study No. 7: Krishnan, Selassie, and Dercon (1998). Based on data from the 1997 Ethiopian Urban Household Survey, this study estimates separate earnings functions for urban men

140. As reported in Wolday Amha (1997, Table 3).

141. Rates of returns to different levels of education are calculated as [exp(bj-bi)–1]/(sj-si) where bi and bj are the regression coefficients of two successive levels of complete education and sj and si stand for the total number of years of schooling in both levels i and j. As in World Bank (1998), we have assigned 3 years of forgone earnings for wage earners with primary education completed, 6 years for those with secondary education, and 4 years for those with higher education.

and women ages 14–65 by sector of employment. The sample sizes are relatively small, ranging between 125 and 336 observations depending on gender and sector of activity. The study estimates the returns to education by introducing a set of three dummy variables for education: (a) whether or not a person has completed primary education; (b) whether or not he or she has completed secondary education; and (c) whether or not he or she has completed higher education (as such, the omitted category comprise individuals with less than primary schooling). Because of the small number of observations for women, the estimated returns to education for them are probably not reliable. For men employed in the public sector, the study estimates a return of 10.6 percent for primary education, and 15 percent for both secondary and higher education (see Table T3.2); for those working in the private sector, the returns are virtually 0 for primary education, while they are estimated at 8.2 percent a year for secondary education and 21.5 percent for higher education.

Table T3.2. Returns to Education in Ethiopia, Computed Using Regression Coefficients in Krishnan, Selaissie, and Dercon (1998)

	Male		Female	
Education level	**Public sector**	**Private sector**	**Public sector**	**Private sector**
Primary education	10.6	n.s.	n.s.	n.s.
Secondary education	15.0	8.2	n.s.	20.9
Higher education	15.1	21.5	n.s.	9.0

n.s. The regression coefficient is not statistically significant.
Note: The rates of return to a given level of education i are calculated as [exp(bj–bi)–1]/(sj–si) where bi and bj are the regression coefficients on the education variable for level i and the next level, j; and sj and si are the total number of years of schooling in levels i and j, respectively. We have assigned three years of forgone earnings for wage earners with primary education, eight years for those with secondary education and four years for those with higher education.
Source: Authors' estimates computed from reported regression results in Krishnan, Selassie, and Dercon 1998, Table A.3.

Study No. 8: Our estimates based on data from the 1999/2000 Ethiopia Household Income and Consumption Expenditure Survey/Welfare Monitoring Survey. As in Study No. 6 described above, the data are such as to require restriction of the sample to men ages 14 to 65 who are the sole wage earners in their households and who reported positive labor market earnings. As in that study, this restriction drastically reduced the sample size, cutting it down from 17,000 observations to 2,000. The resulting subsample contained an overrepresentation of public sector workers: 54 percent compared with 13 percent—the share of comparable workers in the universe of wage earners. We thus draw a random sample of the public sector workers in the data, in order to reduce their share to 13 percent. As a result of this procedure, the final subsample of data contained only 1,024 observations. On average, the workers in this subsample have three years of schooling. The regression estimates imply that an additional year of education yields a private return of 15.6 percent a year—a return that is smaller than the estimate reported in the earlier World Bank study (Study No. 6) and comparable to that reported in Study No. 2. However, as before, the fact that the data refer to a specific type of household (with only one wage earner), the estimated returns are probably biased; a further difficulty is that little can be said about the direction and magnitude of the bias.

Table T3.3. Estimation of Earnings Model Based on Data from the 1999/2000 Ethiopia HICES/WMS

Regressors	Sample average	Coefficient	Coefficient
Age	37.92	–0.0047	–0.0049
Age^2	—	0.0002	0.0002
Years of schooling	3.54	0.1563*	—
Education dummies[a/]			
Primary education	0.31	—	0.6800*
Secondary education	0.11	—	1.6112*
Higher education	0.06	—	2.2517*
Intercept	—	3.7158*	3.7378*
R^2	—	0.2455	0.260
Number of observations in the subsample analyzed	1,024	n.a.	n.a.
Number of private sector workers in the survey	16,834	n.a.	n.a.

n.a. Not applicable.
— Category not used in regression equation.
Statistical significance at the 1% level.
Note: The data refer to a subsample of male household heads ages 14 to 65 who are the sole wage earners in their households and who reported positive labor market earnings; dependent variable is the natural logarithm of monthly earnings.
a. The omitted category comprises individuals with less than primary education.
Source: Authors' estimate based on the 1999/2000 Ethiopia Household Income and Consumption Expenditure Survey (HICES)/Welfare Monitoring Survey (WMS).

Summary of the Estimates of the Returns to Education

None of the estimates based on the eight analyses discussed above is perfect. Nonetheless, the shortcomings in Studies 1, 3, and 6 are sufficiently serious for us to discard the estimates. We also exclude the estimates reported in Study No. 5, since the data refer to workers in only two enterprises; we exclude those for urban workers in Study No. 7 because of the tiny sample on which the estimates were based. Table T3.4 summarizes what we consider to be the most meaningful estimates from the studies we reviewed.

Table T3.4. Summary of the Rates of Returns to Education, Ethiopia
(Percent per year)

	Urban areas			Public and private sectors	
		Private sector			
Rate of return	Public sector[a]	Formal[b]	Formal and informal[c]	Rural areas[d]	All areas[e]
Average rate of return	8.5 (1994; 10.3)	7.4 (1994; 9.2)	—	18.0 (1994)	15.6 (2000; 3.5)
Rate of return by level[f]					
Primary	10.6	—	n.s.	—	32.5
Secondary	15.0	—	8.2	—	19.2
Higher	15.1 (1997)	—	21.5 (1997)	—	22.4 (2000)

— Estimate not available.
n.s. Estimate not statistically different from 0.
Note: Figures in parentheses refer, respectively, to the year of the data and the average years of schooling in the sample of observations.
a. Estimates of average rate of return pertain to full-time employees of both sexes working in public and private enterprises or organizations in major towns, based on the results in Mengistae 1998, Table 3.6; estimates of the returns by level of education pertain to urban male workers ages 14–65, computed by the authors from the results reported in Krishnan, Selassie, and Dercon 1998, Table A.3, using the method described in footnote g below.
b. Estimates refer to the returns for full-time employees of both sexes in public and private sector enterprises or organizations in major towns, based on the results in Mengistae 1998, Table 3.6.
c. Estimates refer to urban male workers ages 14–65, computed by the authors from the results reported in Krishnan, Selassie, and Dercon 1998, Table A.3 using the method described in footnote f below.
d. Estimates refer to rural male full-time nonfarmers, as reported in Verwimp 1996, Table 3.
e. Authors' estimates based on the 1999/2000 *HICES/WMS* (subsample of male household heads ages 14–65 in households where they are the only wage earners and they report positive labor market earnings).
f. The rates of returns to each level of education are calculated as [exp(bj–bi)–1]/(sj–si) where bi and bj are the regression coefficients of two successive levels of completed education and sj and si stand for the total number of years of schooling in both levels i and j. We have assigned 3 years of forgone earnings for wage earners with primary education completed, 8 years for those with secondary education, and 4 years for those with higher education.
Source: See footnotes above.

Appendix Tables

Table A1.1. GDP and Overall Government Revenues, Ethiopia, 1981–2002

				Government revenues (millions of current Birr)				
Ethiopian Calendar	Gregorian calendar	GDP (millions of currentBirr)	GDP deflator (1987 E.C.=100)	Total including grants	Total excluding grants	Grants	Per capita revenues (excl. grants)	Estimated population (millions)
1973	1980/81	10,721.3	40.3	1,947.3	1,756.9	190.4	45.3	38.8
1974	1981/82	11,280.9	41.9	2,138.3	1,876.7	261.6	47.1	39.9
1975	1982/83	12,540.0	43.2	2,433.8	2,174.5	259.3	53	41
1976	1983/84	11,849.3	41.8	2,547.5	2,293.8	253.7	54.4	42.2
1977	1984/85	13,876.2	55.3	2,954.3	2,323.0	631.3	53.6	43.4
1978	1985/86	14,414.5	52.4	3,249.2	2,806.1	443.1	62.8	44.7
1979	1986/86	15,407.7	49.1	3,247.9	2,925.9	322.0	63.5	46.1
1980	1987/88	15,901.5	50.6	4,103.0	3,467.1	635.9	72.8	47.6
1981	1988/89	16,773.9	53.5	4,698.2	3,899.2	799.0	79	49.3
1982	1989/90	17,788.4	55.3	3,544.0	3,142.6	401.4	61.4	51.2
1983	1990/91	19,688.3	66.0	3,169.6	2,706.3	463.3	51.1	53
1984	1991/92	20,792.0	76.4	2,751.1	2,208.1	543.0	40.3	54.8
1985	1992/93	26,671.4	86.4	3,657.4	3,191.3	466.1	59.9	53.3
1986	1993/94	28,328.9	88.7	4,926.1	3,938.9	987.2	71.8	54.9
1987	1994/95	33,885.0	100.0	7,044.6	5,912.9	1,131.7	104.6	56.5
1988	1995/96	37,937.6	100.9	8,063.0	6,966.2	1,096.8	119.6	58.2
1989	1996/97	41,465.1	104.7	9,034.1	7,530.1	1,504.0	126	59.8
1990	1997/98	44,840.3	115.4	9,373.9	8,100.6	1,273.3	132.2	61.3
1991	1998/99	48,687.5	118.2	10,415.0	8,653.0	1,762.0	137.8	62.8
1992	1999/2000	52,074.2	121.9	11,222.5	9,498.5	1,724.0	147.7	64.3
1993	2000/01	52,871.7	114.1	12,819.0	10,191.0	2,628.0	154.8	65.8
1994	2001/02	59,108.5	106.0	13,893.0	11,306.0	2,587.0	167.9	67.3

Source: Africa Live Database, World Bank 2003b; Govt. of Ethiopia (various), Budgetary Revenues and Expenditures; Ministry of Finance and Economic Development.

Table A1.2. Evolution of Revenue-Sharing Formula, Ethiopia, 1994–95 to 2001–02

	Weights assigned to indicators (%)			
Indicators in weighting formula	**1994–95**	**1996–97**	**1997–98**	**2001–02**
Population	30	33.3	60	55
I-distance[a/]	25			
Own revenue to budget ratio	20	33.3	15	
Capital budget allocation in 1993–94	15			
Area	10			
Level of development/expenditure needs[b/]		33.3	25	20
Level of poverty[c/]				10
Revenue-raising effort and sectoral output performance				15

a. Refers to an index of development distance, computed on the basis of indices for education, health, road density, electric power sales, telephone line density, and safe drinking water.
b. Computed using a series of indicators relating to education, health, access to safe drinking water, roads, and recurrent budget implication, as follows. For education, the indicators include: (i) inverse of student to classroom ration; (ii) unit cost of primary school construction; (iii) inverse of pupil-teacher ratio; (iv) primary and secondary school participation rates. For health, they include: (i) health center to population ratio; (ii) hospital bed to population ratio; (iii) unit cost of constructing health center; (iv) under 5 mortality rate; (v) doctors per 100,000 population; (vi) health assistants per 100,000, and primary health services coverage. For access to safe drinking water, the indicator is simply percentage of the population covered. For roads, it is the unit cost of constructing a kilometer of rural road. For recurrent budget implication, the indicator is the region's share of the number of *woredas* and area.
c. Measured by: (i) own revenue to income ratio adjusted by population share; (ii) change in primary school participation rate; (iii) change in the number of health centers; and (iv) change in the length of rural road constructed.
Source: Govt. of Ethiopia 2000a.

Table A1.3. Government Expenditures, Ethiopia, 1981–2002
(millions of current Birr)

		Government expenditures			Interest payment on debt			Recurrent spending	
Ethiopia Calendar	Gregorian calendar	Total	Recurrent	Capital	All debt	Domestic debt	External debt	Net of all debt interest payment	Net of external debt interest payment
1973	1980/81	2,281.5	1,776.4	505.1	84.2	65.0	19.2	1,692.2	1,757.2
1974	1981/82	2,780.8	2,065.8	715.0	83.8	66.1	17.7	1,982.0	2,048.1
1975	1982/83	3,786.1	2,540.8	1,245.3	91.3	70.5	20.8	2,449.5	2,520.0
1976	1983/84	3,347.8	2,414.8	933.0	147.4	120.5	26.9	2,267.4	2,387.9
1977	1984/85	3,883.4	2,696.4	1,187.0	225.4	196.4	29.0	2,471.0	2,667.4
1978	1985/86	4,073.2	2,601.4	1,471.8	194.0	155.2	38.8	2,407.4	2,562.6
1979	1986/86	4,023.7	2,640.6	1,383.1	222.9	151.8	71.1	2,417.7	2,569.5
1980	1987/88	4,893.0	3,433.9	1,459.1	256.2	156.9	99.3	3,177.7	3,334.6
1981	1988/89	5,731.5	3,791.9	1,939.6	248.7	164.3	84.4	3,543.2	3,707.5
1982	1989/90	5,280.9	3,840.8	1,440.1	227.6	180.4	47.2	3,613.2	3,793.6
1983	1990/91	4,849.4	3,635.4	1,214.0	263.2	212.7	50.5	3,372.2	3,584.9
1984	1991/92	4,205.3	3,253.5	951.8	307.3	246.0	61.3	2,946.2	3,192.2
1985	1992/93	5,219.2	3,434.3	1,784.9	530.3	408.9	121.4	2,904.0	3,312.9
1986	1993/94	7,094.0	4,399.5	2,694.5	956.9	809.9	147.0	3,442.6	4,252.5
1987	1994/95	8,371.9	5,215.4	3,156.5	838.6	596.8	241.8	4,376.8	4,973.6
1988	1995/96	9,144.7	5,582.0	3,562.7	922.5	609.6	312.9	4,659.5	5,269.1
1989	1996/97	9,906.0	5,738.0	4,168.0	918.7	635.3	283.4	4,819.3	5,454.6
1990	1997/98	11,229.0	7,082.0	4,147.0	835.7	526.1	309.6	6,246.3	6,772.4
1991	1998/99	14,916.0	10,126.0	4,790.0	957.0	588.0	369.0	9,169.0	9,757.0
1992	1999/00	17,183.6	13,741.6	3,442.0	1,122.0	723.0	399.0	12,619.6	13,342.6
1993	2000/01	15,370.0	10,352.0	5,018.0	1,080.0	575.0	505.0	9,272.0	9,847.0
1994	2001/02	17,394.0	11,366.0	6,028.0					

Source: Africa Live Database, World Bank 2003b; Govt. of Ethiopia various; Budgetary Revenues and Expenditures; Ministry of Finance and Economic Development; World Bank 1998; Public Expenditure Review. All figures are in current prices.

Table A1.4. Current and Capital Government Spending on Education, Ethiopia, 1980–81 to 2001–02

Ethiopian Calendar	Gregorian calendar	GDP (million current Birr)	Spending on education (in millions of current Birr)			GDP deflator (1987 = 100)	Spending on education (in millions of 1987 E.C. Birr)		
			Current	Capital	Total		Current	Capital	Total
1973	1980/81	10,721	—	—	228.3	40.3	—	—	567.2
1974	1981/82	11,281	—	—	270.6	41.9	—	—	645.1
1975	1982/83	12,540	—	—	276.7	43.2	—	—	639.9
1976	1983/84	11,849	—	—	295.6	41.8	—	—	706.8
1977	1984/85	13,876	—	—	327.0	55.3	—	—	591.5
1978	1985/86	14,415	—	—	344.8	52.4	—	—	658.6
1979	1986/86	15,408	—	—	375.3	49.1	—	—	763.6
1980	1987/88	15,902	—	—	403.0	50.6	—	—	795.9
1981	1988/89	16,774	—	—	484.7	53.5	—	—	905.7
1982	1989/90	17,788	—	—	495.6	55.3	—	—	895.6
1983	1990/91	19,688	—	—	489.7	66.0	—	—	742.5
1984	1991/92	20,792	—	—	528.5	76.4	—	—	691.8
1985	1992/93	26,671	—	—	745.8	86.4	—	—	862.8
1986	1993/94	28,329	848	274	1,121.5	88.7	955.4	308.8	1,264.1
1987	1994/95	33,885	913	287	1,199.9	100.0	913.1	286.8	1,199.9
1988	1995/96	37,938	979	457	1,436.8	100.9	970.2	453.1	1,423.3
1989	1996/97	41,465	1,084	427	1,511.5	104.7	1,035.5	408.2	1,443.6
1990	1997/98	44,840	1,175	408	1,582.4	115.4	1,018.3	353.3	1,371.6
1991	1998/99	48,688	1,266	454	1,720.1	118.2	1,070.6	384.2	1,454.8
1992	1999/00	52,074	1,343	296	1,638.8	121.9	1,102.2	242.5	1,344.7
1993	2000/01	52,872	1,564	623	2,186.8	114.1	1,370.5	546.3	1,916.9
1994	2001/02	59,109	1,799	570	2,369.2	106.0	1,696.8	537.4	2,234.2

— Data not available.

Note: Data for the last two years refer to budgets; see Appendix Table A1.5 for the rearrangement of source budget on capital spending.

Source: Africa Live Database, World Bank 2003b; Govt. of Ethiopia various; Budgetary Revenues and Expenditures; Ministry of Finance and Economic Development; World Bank 1998; Public Expenditure Review. All figures are in current prices.

Table A1.5. Capital Spending on Education, Ethiopia, 1993–94 to 2001–02
(millions of current Birr)

		Capital spending included in reported budget for current spending			
Ethiopian calendar	Gregorian calendar	Vehicles & equipment	Education building and construction material	Capital spending as reported in budget data	Total capital spending
1986	1993–94	15.4	2.6	256.0	273.9
1987	1994–95	14.8	2.8	269.2	286.8
1988	1995–96	13.7	1.9	441.9	457.4
1989	1996–97	6.4	0.9	420.1	427.3
1990	1997–98	12.2	0.0	395.4	407.6
1991	1998–99	12.3	0.1	442.0	454.3
1992	1999–2000	7.8	0.0	287.8	295.5
1993	2000–01	17.7	0.1	605.5	623.2
1994	2001–02	30.1	0.0	539.8	569.9

Source: Analysis of budget data files from the Ministry of Finance and Economic Development (MOFED). See Technical Note 1 on the preparation of the data on public spending on education.

Table A2.1. Number of Participants in Nonformal Education by Age Group and Region, Ethiopia, 1999–2002

Age of participants and year of data	Tigray	Afar	Amhara	Oromiya	Dire Dawa	Somali	Benshangul -Gumuz	SNNPR	Harari	Gambella	Addis Ababa	All regions
Ages 7–15												
1999–2000	—	—	—	275,952	967	—	2,711	56,215	560	4,583	11,049	352,037
2000–01	—	—	—	300,020	3,823	—	2,040	74,530	587	1,802	13,824	396,626
2001–02	—	—	—	325,355	5,825	—	4,508	91,032	477	4,826	18,082	450,106
Age above 15 years												
1999–2000	—	—	—	550,765	849	—	4,690	22,206	2,026	5,003	8,346	593,885
2000–01	—	—	—	436,420	758	—	1,228	7,088	1,567	1,944	12,522	461,527
2001–02	—	—	—	337,264	633	—	4,999	9,022	1,335	4,235	21,206	378,694
All ages												
1997–98	—	—	—	—	—	—	—	—	—	—	—	997,967
1998–99	—	—	—	—	—	—	—	—	—	—	—	1,265,007
1999–2000	—	—	—	826,717	1,816	—	7,401	78,421	2,586	9,586	19,395	945,922
2000–01	—	—	—	736,440	4,581	—	3,268	81,618	2,154	3,746	26,346	858,153
2001–02	109,465	—	123,760	662,619	6,458	—	9,507	100,054	1,812	9,061	39,288	828,800

SNNPR Southern Nations and Nationalities Peoples Republic.
— Data not available.
Note: Data refer to students enrolled at all three levels of nonformal education classes. In Table 2.2, the totals enrolled in nonformal education are shown at about 1 million, divided more or less evenly between those aged 7–14 and those aged 15 and older. The distribution between the two age groups is an estimate based on the trend data shown here and the assumption that in Tigray and Amhara (where only total enrollments are known) the distribution is the same as the average observed in the other regions; and that in Afar and Somalia (where data are not available), total enrollments in nonformal programs may reach about 30,000 in total.
Source: IIZ/DVV-ETH various issues.

Table A2.2. Percentage of Population Ever Enrolled in Grade 1 at Each Age, Ethiopia, 1996 to 2000

	Welfare Monitoring Surveys			Labor Force Survey
Age	Jan./Feb. 1996 (SY: 1995–96)	Mar./April 1998 (SY: 1997–98)	Jan./Feb. 2000 (SY: 1999–2000)	May 1999 (SY: 1998–99)
7	12.6	17.3	20.6	21.9
8	17.0	24.7	31.5	29.3
9	23.2	32.2	38.4	37.7
10	27.6	38.7	46.3	45.7
11	30.4	44.1	51.0	50.8
12	32.1	43.3	51.9	51.4
13	34.2	43.7	53.2	54.4
14	36.7	45.5	51.8	54.6
15	37.4	41.4	49.7	—
16	37.0	41.1	46.1	—
17	36.9	42.6	46.7	—
18	35.2	38.1	39.8	—

SY School year.
— Data not available.
Note: The first date in each column refers to the date of data collection in each survey; the second, to the corresponding school year (SY).
Source: Authors' estimates based on the indicated surveys.

Table A2.3. Cohort Completion Rates, Ethiopia, 1995–96 and circa 2000

	Composite cohort rates		Cross-sectional rates
Grade	1995–96	2001–02	2000
1	37.2	60.5	90.70
2	24.6	45.1	81.32
3	22.0	39.4	74.03
4	20.4	35.5	65.56
5	18.9	31.2	52.72
6	17.2	27.2	41.80
7	17.1	26.4	38.91
8	15.1	22.0	30.92
9	13.3	20.1	21.90
10	9.2	16.2	17.82
11	7.9	5.3	14.49
12	6.1	4.6	6.39

Source: Rates are obtained as the product of entry rates reported in Table A2.2 and survival rates reported in Technical Note Table T2.5; see text section on completion rates for an explanation of the difference between cohort and cross-sectional survival rates.

Table A3.1. Recurrent Public Spending on Education by Region, Ethiopia, 1993–94 to 2001–02
(in millions of current Birr)

Region	1986 E.C. 1993–94	1987 E.C. 1994–95	1988 E.C. 1995–96	1989 E.C. 1996–97	1990 E.C. 1997–98	1991 E.C. 1998–99	1992 E.C. 1999–2000	1993 E.C. 2000–01	1994 E.C. 2001–02
Tigray	39.0	43.5	52.6	59.9	64.0	70.3	72.2	82.0	96.7
Afar	15.2	16.6	13.2	8.0	8.8	12.5	16.3	17.7	24.5
Amhara	163.7	179.0	205.5	212.9	222.0	232.4	229.8	259.0	280.2
Oromiya	259.4	283.1	321.6	344.3	370.2	408.0	416.4	460.2	540.3
Somali	19.1	21.2	15.4	14.2	13.0	13.7	16.8	22.7	26.1
Benshangul-Gumuz	12.4	13.7	14.3	17.7	21.0	22.4	22.4	25.0	25.3
SNNPR	129.8	141.2	147.3	184.0	195.5	218.7	218.0	250.8	261.6
Gambella	6.7	7.6	8.2	10.3	11.8	13.6	16.7	16.2	20.3
Harari	7.5	7.7	8.1	10.0	12.3	11.9	13.2	16.7	16.1
Addis Ababa	75.7	83.4	76.8	81.5	94.5	93.9	109.1	126.0	146.1
Dire Dawa	5.7	6.2	7.2	6.8	7.8	8.6	8.4	11.6	14.3
Federal	113.4	109.9	109.3	134.4	154.0	159.7	203.9	275.6	347.8
Ethiopia	847.6	913.1	979.4	1,084.1	1,174.8	1,265.8	1,343.2	1,563.5	1,799.3
Memorandum:									
GDP deflator	88.7	100.0	100.9	104.7	115.4	118.2	121.9	114.1	106.0

SNNPR Southern Nations and Nationalities Peoples Republic.
Source: Electronic data files from MOFED, supplemented with estimates based on annual school censuses.

Table A3.2. Current Expenditures by Function, Ethiopia, 1993–94 to 2001–02 (1986 E.C. to 1994 E.C.)
(in millions of current Birr)

Indicator	1986 E.C. 1993–94	1987 E.C. 1994–95	1988 E.C. 1995–96	1989 E.C. 1996–97	1990 E.C. 1997–98	1991 E.C. 1998–99	1992 E.C. 1999–2000	1993 E.C. 2000–01	1994 E.C. 2001–02
Administration	42.6	48.0	67.8	102.0	119.3	151.1	157.0	169.3	190.0
Primary & secondary	685.4	737.3	783.6	820.3	860.1	901.2	926.4	1,062.7	1,134.7
Grades 1–8	583.8	628.8	670.7	722.7	761.0	798.8	822.0	915.1	979.7
Grades 9–12	101.6	108.5	112.9	97.6	99.1	102.4	104.3	147.6	155.0
TVET	6.3	8.2	7.1	7.7	15.2	17.0	16.2	25.1	91.4
TTI	12.8	12.7	13.6	15.6	14.3	19.0	19.5	16.9	21.4
TTC	3.7	4.0	3.9	7.7	11.5	16.3	15.8	18.1	20.4
Higher education	78.8	86.0	89.0	119.1	140.3	145.6	190.2	247.1	310.5
Other	18.1	16.8	14.6	11.7	14.2	15.5	18.1	24.3	31.0
Total	847.6	913.1	979.4	1,084.1	1,174.8	1,265.8	1,343.2	1,563.5	1,799.3
Memoranda:									
GDP Deflator	88.7	100.0	100.9	104.7	115.4	118.2	121.9	114.1	106.0
GDP	28,328.9	33,885.0	37,937.6	41,465.1	44,840.3	48,687.5	52,074.2	52,871.7	59,108.5

TTC Teacher training institutes; TTI Teacher training colleges; TVET Technical and vocational education and training.
Note: Other includes special education and adult education.
Source: Electronic data files from MOFED, supplemented with estimates based on annual school censuses.

Table A3.3. Recurrent Spending by Subsector and Region, Ethiopia, 1993–94 to 2001–02 (in millions of current Birr)

	1986 E.C.	1987 E.C.	1988 E.C.	1989 E.C.	1990 E.C.	1991 E.C.	1992 E.C.	1993 E.C.	1994 E.C.
Region/subsector	**1993–94**	**1994–95**	**1995–96**	**1996–97**	**1997–98**	**1998–99**	**1999–00**	**2000–01**	**2001–02**
Tigray									
Administration	2.5	3.2	4.1	4.5	4.7	4.8	4.9	5.8	6.4
Primary & secondary	33.4	36.7	45.2	53.0	55.4	59.9	61.3	69.7	82.8
Grades 1–8	29.6	32.3	39.9	48.1	50.7	54.9	56.9	64.2	73.2
Grades 9–12	3.9	4.5	5.3	4.9	4.7	5.0	4.4	5.4	9.6
TVET	0.4	0.6	0.7	0.7	1.1	1.2	1.7	1.7	2.0
TTI	1.0	1.3	1.4	1.2	1.1	1.2	1.4	1.6	1.7
TTC	0.0	0.0	0.0	0.0	0.6	1.9	1.6	1.8	2.1
Higher education	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.8
Other	1.6	1.7	1.1	0.5	1.1	1.3	1.2	1.0	1.0
Total	39.0	43.5	52.6	59.9	64.0	70.3	72.2	82.0	96.7
Afar									
Administration	0.7	0.9	1.0	1.4	2.1	3.0	6.2	3.0	4.4
Primary & secondary	14.4	15.5	12.0	6.6	6.7	9.4	10.1	14.7	19.1
Grades 1–8	12.1	13.1	10.1	6.0	5.2	7.2	7.4	8.7	10.8
Grades 9–12	2.3	2.5	1.9	0.7	1.5	2.2	2.7	5.9	8.4
TVET	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTI	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Higher education	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	1.0
Total	15.2	16.6	13.2	8.0	8.8	12.5	16.3	17.7	24.5

(continued)

Table A3.3. Recurrent Spending by Subsector and Region, Ethiopia, 1993–94 to 2001–02 (*Continued*)
(in millions of current Birr)

Region/subsector	1986 E.C. 1993–94	1987 E.C. 1994–95	1988 E.C. 1995–96	1989 E.C. 1996–97	1990 E.C. 1997–98	1991 E.C. 1998–99	1992 E.C. 1999–00	1993 E.C. 2000–01	1994 E.C. 2001–02
Amhara									
Administration	3.8	5.3	23.4	23.9	30.8	33.4	25.0	29.9	36.4
Primary & secondary	154.6	166.9	175.0	180.2	182.6	187.7	197.2	219.3	230.0
Grades 1–8	136.7	147.6	155.1	163.3	166.2	170.9	180.9	200.1	210.4
Grades 9–12	17.9	19.3	19.9	16.9	16.3	16.8	16.3	19.3	19.6
TVET	0.6	0.8	0.7	1.0	0.8	0.9	0.8	1.4	4.8
TTI	2.1	3.1	3.4	3.9	2.1	3.1	1.6	1.8	1.8
TTC	0.0	0.0	0.0	0.7	1.9	2.6	1.3	1.8	1.8
Higher education	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	2.7	2.9	3.0	3.3	3.8	4.6	3.8	4.9	5.4
Total	163.7	179.0	205.5	212.9	222.0	232.4	229.8	259.0	280.2
Oromiya									
Administration	4.7	6.5	7.4	27.2	35.6	50.8	54.1	40.3	44.2
Primary & secondary	245.8	265.4	302.4	305.3	320.0	339.7	346.8	395.0	434.5
Grades 1–8	214.1	230.1	261.3	272.3	287.3	307.5	313.3	338.9	370.2
Grades 9–12	31.7	35.3	41.1	33.1	32.8	32.2	33.5	56.1	64.3
TVET	0.8	1.0	1.1	1.2	3.0	4.1	4.2	10.7	42.6
TTI	3.2	4.6	4.9	5.6	5.6	5.7	4.8	4.7	7.8
TTC	0.0	0.0	0.0	1.3	1.7	2.6	2.9	3.1	3.1
Higher education	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	4.9	5.6	5.7	3.6	4.4	5.1	3.6	6.2	8.1
Total	259.4	283.1	321.6	344.3	370.2	408.0	416.4	460.2	540.3

Somali									
Administration	1.1	1.3	2.9	5.4	4.8	6.2	5.5	2.8	2.9
Primary & secondary	17.9	19.7	12.4	8.7	8.3	6.8	9.9	18.2	20.8
Grades 1–8	15.7	17.0	10.9	7.7	7.5	6.3	9.0	15.8	18.7
Grades 9–12	2.2	2.7	1.6	1.0	0.7	0.5	1.0	2.4	2.1
TVET	0.0	0.0	0.0	0.0	0.0	—	—	—	0.7
TTI	0.0	0.0	0.0	0.0	0.0	0.8	1.4	1.7	1.7
TTC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Higher education	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	19.1	21.2	15.4	14.2	13.0	13.7	16.8	22.7	26.1
Benshangul-Gumuz									
Administration	0.9	1.2	1.6	2.1	2.5	2.9	3.4	4.1	4.5
Primary & secondary	11.3	12.3	12.5	15.3	18.1	19.2	18.7	20.6	20.2
Grades 1–8	10.3	11.1	11.4	13.5	16.3	16.7	16.7	18.1	18.2
Grades 9–12	1.1	1.2	1.1	1.8	1.9	2.5	2.0	2.6	2.0
TVET	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTI	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Higher education	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.2	0.2	0.1	0.3	0.3	0.3	0.3	0.4	0.7
Total	12.4	13.7	14.3	17.7	21.0	22.4	22.4	25.0	25.3

(*continued*)

Table A3.3. Recurrent Spending by Subsector and Region, Ethiopia, 1993–94 to 2001–02 (*Continued*)
(in millions of current Birr)

	1986 E.C.	1987 E.C.	1988 E.C.	1989 E.C.	1990 E.C.	1991 E.C.	1992 E.C.	1993 E.C.	1994 E.C.
Region/subsector	**1993–94**	**1994–95**	**1995–96**	**1996–97**	**1997–98**	**1998–99**	**1999–00**	**2000–01**	**2001–02**
SNNPR									
Administration	4.9	8.5	7.7	15.0	15.3	23.8	22.8	23.7	25.0
Primary & secondary	120.9	126.6	135.1	161.7	168.0	179.0	179.6	207.2	211.4
Grades 1–8	107.1	111.8	119.6	148.2	154.9	166.9	167.3	190.9	194.9
Grades 9–12	13.7	14.8	15.5	13.5	13.1	12.0	12.3	16.4	16.5
TVET	0.0	0.7	0.8	0.8	3.5	4.1	3.5	4.3	6.1
TTI	1.6	2.4	2.4	3.4	4.1	6.9	7.1	4.0	5.2
TTC	0.0	0.0	0.0	1.5	3.0	4.3	4.3	5.6	7.0
Higher education	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	2.4	3.1	1.3	1.6	1.5	0.8	0.7	6.0	6.9
Total	129.8	141.2	147.3	184.0	195.5	218.7	218.0	250.8	261.6
Gambella									
Administration	0.7	1.0	1.4	1.9	2.4	2.9	3.6	3.8	4.0
Primary & secondary	5.5	6.0	6.1	7.6	8.4	9.6	10.5	10.4	13.4
Grades 1–8	5.0	5.4	5.5	7.0	7.5	8.5	9.5	9.5	10.2
Grades 9–12	0.5	0.6	0.6	0.6	0.9	1.1	1.0	0.9	3.2
TVET	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
TTI	0.4	0.5	0.6	0.7	0.9	1.0	2.4	1.9	2.1
TTC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Higher education	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.5
Total	6.7	7.6	8.2	10.3	11.8	13.6	16.7	16.2	20.3

Harari									
Administration	0.4	0.4	0.4	0.7	1.0	1.1	1.1	1.2	1.3
Primary & secondary	6.2	6.5	6.9	8.4	10.7	10.3	11.2	14.1	13.6
Grades 1–8	5.2	5.5	5.6	6.5	8.8	8.4	9.2	10.4	10.3
Grades 9–12	1.0	1.0	1.2	1.9	1.9	1.9	2.0	3.7	3.3
TVET	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTI	0.8	0.7	0.8	0.8	0.5	0.4	0.8	1.2	1.1
TTC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Higher education	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
Total	7.5	7.7	8.1	10.0	12.3	11.9	13.2	16.7	16.1
Addis Ababa									
Administration	2.0	2.8	4.5	7.2	8.7	9.7	18.2	27.5	25.6
Primary & secondary	69.6	75.4	68.6	66.6	74.8	72.5	74.3	84.9	79.1
Grades 1–8	43.3	49.9	45.4	44.6	50.9	46.1	46.7	52.8	56.2
Grades 9–12	26.3	25.6	23.2	22.1	23.9	26.4	27.6	32.0	22.9
TVET	2.5	4.6	3.1	3.3	6.2	6.0	5.4	6.2	33.3
TTI	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTC	0.0	0.0	0.0	4.1	4.4	4.9	5.6	5.9	6.4
Higher education	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	1.6	0.6	0.5	0.3	0.5	0.7	5.6	1.6	1.7
Total	75.7	83.4	76.8	81.5	94.5	93.9	109.1	126.0	146.1

(*continued*)

Table A3.3. Recurrent Spending by Subsector and Region, Ethiopia, 1993–94 to 2001–02 (*Continued*)
(in millions of current Birr)

Region/subsector	1986 E.C. 1993–94	1987 E.C. 1994–95	1988 E.C. 1995–96	1989 E.C. 1996–97	1990 E.C. 1997–98	1991 E.C. 1998–99	1992 E.C. 1999–00	1993 E.C. 2000–01	1994 E.C. 2001–02
Dire Dawa									
Administration	0.1	0.2	0.2	0.3	1.0	1.2	1.3	2.1	2.9
Primary & secondary	5.0	5.3	6.1	5.9	6.2	6.6	6.6	8.6	9.7
Grades 1–8	3.9	4.1	4.6	4.7	4.7	5.0	5.1	5.7	6.6
Grades 9–12	1.1	1.2	1.5	1.2	1.4	1.6	1.5	2.9	3.2
TVET	0.4	0.5	0.7	0.6	0.6	0.7	0.5	0.9	1.7
TTI	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Higher education	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.2	0.2	0.2	0.0	0.0	0.1	0.0	0.0	0.0
Total	5.7	6.2	7.2	6.8	7.8	8.6	8.4	11.6	14.3
Federal government									
Administration	20.9	16.7	13.1	12.4	10.5	11.2	11.0	25.0	32.6
Primary & secondary	0.7	1.0	1.1	1.0	1.0	0.4	0.1	0.1	0.1
Grades 1–8	0.7	1.0	1.1	1.0	0.9	0.4	0.0	0.0	0.0
Grades 9–12	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1

TVET	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTC	3.7	4.0	3.9	0.0	0.0	0.0	0.0	0.0	0.0
TTI	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Higher education	78.8	86.0	89.0	119.1	140.3	145.6	190.2	246.6	309.7
Other	4.0	2.2	2.3	2.0	2.3	2.5	2.6	3.9	5.4
Total	113.4	109.9	109.3	134.4	154.0	159.7	203.9	275.6	347.8
Ethiopia									
Administration	42.6	48.0	67.8	102.0	119.3	151.1	157.0	169.3	190.0
Primary & secondary	685.4	737.3	783.6	820.3	860.1	901.2	926.4	1062.7	1134.7
Grades 1–8	583.8	628.8	670.7	722.7	761.0	798.8	822.0	915.1	979.7
Grades 9–12	101.6	108.5	112.9	97.6	99.1	102.4	104.3	147.6	155.0
TVET	6.3	8.2	7.1	7.7	15.2	17.0	16.2	25.1	91.4
TTC	12.8	12.7	13.6	15.6	14.3	19.0	19.5	16.9	21.4
TTI	3.7	4.0	3.9	7.7	11.5	16.3	15.8	18.1	20.4
Higher education	78.8	86.0	89.0	119.1	140.3	145.6	190.2	247.1	310.5
Other	18.1	16.8	14.6	11.7	14.2	15.5	18.1	24.3	31.0
Total	847.6	913.1	979.4	1084.1	1174.8	1265.8	1343.2	1563.5	1799.3
Memoranda:									
GDP deflator	88.7	100.0	100.9	104.7	115.4	118.2	121.9	114.1	106.0

— Data not available.
SNNPR Southern Nations and Nationalities Peoples Republic.
Source: Electronic data files from MOFED, supplemented with estimates based on annual schools census.

Table A3.4. Earnings Function for Teachers in Grades 1–12 in Government Schools, Oromiya, 2002–03

Variable	Sample mean	Coefficient	t-statistic
Experience (in years)	12.2	0.060**	248.89
Experience^2	213.8	–0.001**	–135.79
Teacher certification[a/]			
TTC (omitted category)	2.0	n.a.	n.a.
TTI	84.8	–0.183**	–42.27
BA/MA	2.9	0.308**	53.37
Diploma	7.6	0.031	6.53
1, 2, or 3 years of university	2.0	–0.020**	–3.46
Grades 9, 10, 11, 12, 12+1	0.5	–0.221**	–24.46
Other	0.3	–0.133**	–10.9
Teaching assignment			
Grades 1–4 (omitted category)	59.5	n.a.	n.a.
Grades 5–8	31.0	0.029**	21.48
Grades 9–12	9.6	0.109**	34.55
Intercept		6114.0	1371.13
R-squared	n.a.	0.84	n.a.
Number of observations	45,439	n.a.	n.a.
Memorandum on the dependent variable[b/]:			
ln (monthly salary)	6.5	n.a.	n.a.
Monthly salary (excl. pension; in Birr)	683	n.a.	n.a.

BA Bachelor's degree; MA Master's degree; TTC Teacher training institutes; TTI Teacher training colleges; TVET Technical and vocational education and training.
n.a. Not applicable.
**Statistical significance at the 1% confidence level.
a. The certification categories include university diploma; incomplete university studies lasting one to three years; and secondary school completion at grades 9–12, with additional sundry training in some cases; and a residual "other" category comprising teachers with qualifications other than those listed above.
b. The dependent variable is the monthly salary expressed on a logarithm scale.
Source: Analysis of a data file on teachers supplied by the Oromiya Bureau of Education in the context of this study.

Table A3.5. Teacher Salary Scale in Primary and Secondary Education, Ethiopia (effective February 2001)

Level of instruction			Salary Scale (Birr per month)										
First cycle primary	Second cycle primary	Secondary and teacher training institute (TTI)	Starting	1	2	3	4	5	6	7	8	9	Ceiling
Beginner teacher			403	426	450	475	502	530	560	595	630	672	716
Junior teacher			475	502	530	560	595	630	672	716	760	805	850
Teacher	Beginner teacher		560	595	630	672	716	760	805	850	895	942	990
Senior Teacher	Junior teacher		672	716	760	805	850	895	942	990	1,040	1,092	1,145
Associate lead teacher	Teacher	Beginner teacher	805	850	895	942	990	1,040	1,092	1,145	1,200	1,255	1,310
Lead teacher	Senior teacher	Junior teacher	942	990	1,040	1,092	1,145	1,200	1,255	1,310	1,370	1,435	1,500
	Associate lead teacher	Teacher	1,092	1,145	1,200	1,255	1,310	1,370	1,435	1,500	1,565	1,635	1,707
	Lead teacher	Senior teacher	1,255	1,310	1,370	1,435	1,500	1,565	1,635	1,707	1,780	1,853	1,926
		Associate lead teacher	1,435	1,500	1,565	1,635	1,707	1,780	1,853	1,926	2,000	2,075	2,150
		Lead teacher	1,635	1,707	1,780	1,853	1,926	2,000	2,075	2,150	2,225	2,325	2,425

Note: Salaries reflects the new scale following an 18 percent raise that became effective February 2001.
Source: Federal Civil Service Commission; 1994 E.C., as reported in ECORYS-NEI 2003.

Table A3.6. Data for Decomposition of Spending Per Student in Government Primary and Secondary Schools, Ethiopia, 2001–02

		Components of spending on teachers per student					
Grades and Region	Overall spending per student (Birr/year)	Share of recurrent spending on teachers (%)	Average remuneration of teacher (Birr/year)	Pupil-Teacher ratio	Average section size	Students' weekly instructional hours	Teachers' weekly teaching load (hours)
Grades 1–4							
Ethiopia	**86**	**92.5**	**5,987**	**75.2**	**77.0**	**24.6**	**24.0**
Tigray	77	89.8	4,882	70.3	64.9	24.1	26.1
Afar	302	71.9	7,037	32.5	42.5	25.6	19.5
Amhara	86	96.4	6,259	75.6	78.4	24.3	23.4
Oromiya	84	90.4	6,017	79.2	76.8	24.9	25.6
Somali	148	84.5	7,037	56.3	—	—	—
Benshangul-Gumuz	—	—	5,628	46.4	57.3	25.9	—
SNNPR	78	97.7	6,062	79.6	84.4	24.5	23.1
Gambella	—	—	5,326	40.2	60.8	25.6	—
Harari	254	73.2	5,079	27.3	56.2	24.1	11.7
Dais Ababa	174	75.2	5,440	41.7	62.0	22.7	15.3
Dire Dawa	199	80.5	6,486	40.5	61.4	24.6	16.2
Grades 5–8							
Ethiopia	**160**	**89.8**	**7,005**	**48.8**	**68.0**	**24.0**	**17.2**
Tigray	126	82.2	7,192	69.2	67.1	23.8	24.6
Afar	456	65.5	8,383	28.1	41.4	25.5	17.3
Amhara	129	94.8	7,131	58.4	70.0	23.7	19.8

Oromiya	177	89.3	7,251	45.9	66.3	24.3	16.8
Somali	402	87.4	8,383	23.9	0.0	—	—
Benshangul-Gumuz	—	—	6,746	78.2	63.4	25.9	—
SNNPR	159	93.8	6,855	45.9	70.2	24.2	15.8
Gambella	—	—	6,382	34.7	64.8	25.5	—
Harari	412	82.1	7,682	22.7	53.9	24.0	10.1
Dais Ababa	200	76.7	5,365	35.0	69.1	22.7	11.5
Dire Dawa	190	91.4	7,522	43.3	66.2	23.9	15.6
Grades 9–12							
Ethiopia	**283**	**71.0**	**10,341**	51.5	**82.6**	**24.08**	**15.0**
Tigray	205	66.3	12,102	89.1	80.5	24.01	26.6
Afar	1852	13.4	13,604	54.8	108.0	25.63	13.0
Amhara	239	82.7	8,720	44.1	77.2	24.00	13.7
Oromiya	372	69.2	12,022	46.7	79.9	24.09	14.1
Somali	557	73.5	13,604	33.2	—	—	—
Benshangul-Gumuz	—	—	10,595	23.6	65.7	25.25	—
SNNPR	168	73.1	7,468	60.8	91.5	24.23	16.1
Gambella	—	—	14,233	39.0	62.7	26.25	—
Harari	579	64.0	12,299	33.2	83.0	23.63	9.5
Dais Ababa	251	78.8	10,262	51.8	87.4	23.63	14.0
Dire Dawa	343	73.3	10,178	40.5	76.7	23.63	12.5

— Data not available; data for Ethiopia exclude data for Benshangul-Gumuz, Gambella, and Somali.
SNNPR, Southern Nations and Nationalities Peoples Republic.
Source: Analysis of the Ministry of Education's Ethiopia 2001–02 school census, supplemented with estimates of student's instructional hours based on distribution of schools by shifts of operation and hours of instruction in the curriculum, and estimates of teaching loads based on the data in the rest of the Table. See text discussion for algebraic relationships underlying the calculations.

Table A4.1. Percentage of the Population Ever Enrolled in Grade 1 at Each Age by Locality, Gender, and Wealth Group, Ethiopia, 2000

Age (years)	By gender		By locality		By wealth group[a/]		
	Male	Female	Urban	Rural	Poorest quintile	Richest quintile	Whole sample
7	21.4	19.6	69.7	14.9	22.6	52.4	20.5
8	33.0	29.8	80.2	25.4	35.3	64.5	31.4
9	40.6	35.7	87.2	31.7	42.8	70.7	38.2
10	47.5	44.8	87.4	39.6	49.8	76.7	46.2
11	55.4	46.2	91.1	44.5	55.4	78.6	50.9
12	57.3	45.8	92.4	45.0	53.9	77.5	51.8
13	61.1	45.0	90.3	46.2	50.7	75.8	53.1
14	58.5	44.5	89.8	44.4	58.7	76.5	51.8
15	58.9	39.7	86.7	42.2	51.3	76.2	49.7
16	54.9	36.6	85.4	37.9	46.4	77.1	46.1
17	56.0	36.9	85.7	36.6	54.5	78.2	46.7
18	50.4	30.5	83.2	30.1	44.3	74.5	39.8
Cohort entry rate to grade 1[b/]	**59.8**	**44.8**	**90.0**	**45.3**	**54.0**	**76.1**	**52.4**

a. Defined according to a ranking of households by household consumption expenditure per adult equivalent. Because of missing consumption expenditure data, the data by wealth group is based on fewer observations than the rest of the Table, and the percentages appear to be biased upward, by about 15 to 20 percent. To the extent that the upward bias is greater among the poorest quintile, the rich-poor gap would be larger than implied by the data shown here.
b. Computed as the average of the percentage ever enrolled among 13–14 year olds, the ages at which the percentage tends to peak. For the percentage among the poorest quintile, the average is based on the data for ages 11–15 to smooth out the somewhat erratic pattern.
Source: Analysis of the 2000 Ethiopia Welfare Monitory Survey and the 2000 Ethiopia Household, Income and Consumption Expenditure Survey.

Table A4.2. Student Flow Indicators in Primary Education across Regions, Ethiopia, circa 2000

Region	Percentage of cohort ever enrolled in grade 1	Composite cohort survival rate from grade 1 (%)		Composite cohort completion rate(%)		Repeaters as percentage of enrollments (grades 1–8)
		To grade 4	To grade 8	Grade 4	Grade 8	
Tigray	61.4	84.2	69.9	51.7	42.9	10.1
Afar	38.1					20.7
Amhara	46.2	65.5	41.0	30.2	19.0	16.6
Oromiya	51.2	60.6	37.2	31.0	19.1	12.1
Somali	32.1					
Benshangul-Gumuz	65.0	47.6	17.5	31.0	11.4	22.7
SNNPR	60.0	45.0	16.5	27.0	9.9	24.3
Gambella	89.8	39.1	16.6	35.2	14.9	20.1
Harari	73.9	55.5	46.8	41.1	34.6	14.0
Addis Ababa	94.5	91.8	87.0	86.8	82.3	10.3
Dire Dawa	79.1	68.3	61.5	54.0	48.7	11.2

SNNPR, Southern Nations and Nationalities Peoples Republic.
Note: Blanks denote data unreliable; see previous table for notes on each indicator.
Source: Percentage ever enrolled in grade 1 based on analysis of the 1999 Labor Force Survey; remaining columns based on data supplied by the Ministry of Education on enrollments and repeaters (including readmitted pupils) by grade for two school years, 2000–01 and 2001–02.

Table A4.3. Probit Estimates of Changes in the Probability of Being Registered for School among Children Ages 7 to 14 Years Using Data from the 1999/2000 WMS/HICES

Indicator	Sample mean (standard deviation)		Change in Probability that child is registered for school[a/]					Rural children	
	Rural sample	Urban sample	All	Children ages 7 & 8	Children ages 13 & 14	Boys	Girls	2 km or less from nearest primary school	More than 2 km from nearest primary school
No. of observations	9,333	8,076	17,409	4,557	4,096	8,676	8,733	4,232	5,101
Dependent variable: Child is registered for school	2,455	6,263							
Change in probability associated with:									
Urban area (relative to rural)[b/]	n.r.	n.r.	0.305*	0.292*	0.253*	0.295*	0.309*	n.a.	n.a.
			(0.020)	(0.031)	(0.029)	(0.023)	(0.025)		
Region (relative to Amhara)[b/]									
Tigray	0.066	0.08	0.008	–0.123*	0.073	–0.023	0.038	0.034	–0.021
			(0.027)	(0.035)	(0.042)	(0.035)	(0.031)	(0.053)	(0.028)
Afar	0.003	0.008	–0.095*	–0.151*	0.039	–0.033	–0.160*	–0.122*	–0.127*
			(0.037)	(0.042)	(0.058)	(0.049)	(0.051)	(0.050)	(0.040)
Oromiya	0.394	0.298	–0.044*	–0.073*	–0.012	0.024	–0.116*	–0.101*	–0.039
			(0.019)	(0.030)	(0.029)	(0.024)	(0.025)	(0.034)	(0.022)
Somali	0.01	0.034	–0.271*	–0.276*	–0.234*	–0.200*	–0.335*	–0.193*	–0.183*
			(0.032)	(0.031)	(0.053)	(0.039)	(0.036)	(0.045)	(0.016)
Benshangul-Gumuz	0.011	0.007	0.090*	–0.02	0.092*	0.179*	–0.017	0.137*	0.084*
			(0.032)	(0.053)	(0.042)	(0.036)	(0.042)	(0.058)	(0.039)
SNNPR	0.249	0.113	–0.049*	–0.128*	0.013	0.045	–0.149*	–0.083*	0.012
			(0.022)	(0.031)	(0.030)	(0.026)	(0.028)	(0.034)	(0.025)

Gambella	0.002	0.004	0.171*	0.047	0.218*	0.213*	0.114	0.251*	0.432*
			(0.044)	(0.067)	(0.040)	(0.043)	(0.058)	(0.062)	(0.066)
Harari	0.001	0.008	0.120*	0.083	0.103*	0.195*	0.026	0.059	0.023
			(0.025)	(0.048)	(0.037)	(0.031)	(0.038)	(0.050)	(0.042)
Addis Ababa	0.001	0.227	0.091*	0.113*	0.056	0.110*	0.065*	0.257*	0.051
			(0.023)	(0.045)	(0.034)	(0.027)	(0.032)	(0.081)	(0.041)
Dire Dawa	0.002	0.02	–0.130*	–0.166*	–0.093	–0.032	–0.233*	–0.139*	–0.092*
			(0.036)	(0.040)	(0.049)	(0.036)	(0.047)	(0.054)	(0.026)
Distance in km to nearest facility									
Primary school	3.467	0.868	–0.020*	–0.035*	–0.018*	–0.017*	–0.026*	–0.057*	–0.015*
	(3.459)	(1.214)	(0.004)	(0.006)	(0.005)	(0.004)	(0.005)	(0.013)	(0.003)
Post office	20.927	5.128	–0.002*	–0.001	–0.001*	–0.001*	–0.002*	–0.001	0
	(17.540)	(13.044)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
All-weather road	10.743	0.415	–0.001	0	–0.001	0	–0.001	–0.001	–0.001*
	(14.345)	(1.693)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Cluster (i.e., **enumeration area**) **averages**									
Percentage of other households in cluster using nearest primary school	0.482 (0.254)	0.654 (0.217)	0.339* (0.029)	0.229* (0.044)	0.325* (0.041)	0.339* (0.035)	0.342* (0.037)	0.382* (0.050)	0.298* (0.038)
Percentage literate among other household heads in cluster	0.245 (0.167)	0.579 (0.192)	0.210* (0.037)	0.275* (0.055)	0.220* (0.050)	0.190* (0.046)	0.233* (0.047)	0.153* (0.072)	0.032 (0.055)
Household resource dummy variable[b/,c/] (**relative to quintile 1, the poorest**)									
Quintile 2	0.253	0.192	0.042*	0.032	0.043	0.066*	0.018	0.061*	0.043*
			(0.013)	(0.025)	(0.023)	(0.017)	(0.019)	(0.023)	(0.018)

(*continued*)

Table A4.3. Probit Estimates of Changes in the Probability of Being Registered for School among Children Ages 7 to 14 Years Using Data from the 1999/2000 WMS/HICES (*Continued*)

	Sample mean (standard deviation)		Change in Probability that child is registered for school[a/]						
								Rural children	
Indicator	Rural sample	Urban sample	All	Children ages 7 & 8	Children ages 13 & 14	Boys	Girls	2 km or less from nearest primary school	More than 2 km from nearest primary school
Quintile 3	0.206	0.17	0.059*	0.051	0.029	0.079*	0.037	0.091*	0.050*
			(0.015)	(0.027)	(0.024)	(0.018)	(0.022)	(0.028)	(0.021)
Quintile 4	0.168	0.169	0.073*	0.115*	0.036	0.097*	0.053*	0.083*	0.078*
			(0.016)	(0.030)	(0.027)	(0.020)	(0.021)	(0.030)	(0.024)
Quintile 5	0.096	0.223	0.084*	0.186*	0.023	0.110*	0.054*	0.129*	0.055*
			(0.016)	(0.032)	(0.027)	(0.020)	(0.023)	(0.034)	(0.028)
No. of adult equivalents in household	5.291	5.47	0.008	0.002	0.022*	0.016	–0.003	–0.003	0.017*
	(1.718)	(2.239)	(0.006)	(0.011)	(0.011)	(0.008)	(0.009)	(0.011)	(0.009)
Household head variables									
Male (relative to female)[b/]	0.807	0.659	–0.034	–0.055	–0.027	–0.048	–0.017	–0.054	0.02
			(0.020)	(0.039)	(0.031)	(0.026)	(0.028)	(0.043)	(0.032)
Age in years	46.29	45.005	0.013*	0.006	0.014*	0.009*	0.016*	0.009	0.004
	(12.278)	(12.298)	(0.002)	(0.005)	(0.004)	(0.003)	(0.003)	(0.005)	(0.003)
Age squared			–0.000*	0	–0.000*	–0.000*	–0.000*	–0.000*	0
			0	0	0	0	0	0	0

Is literate[b/]	0.23	0.604	0.114*	0.136*	0.052*	0.113*	0.117*	0.077*	0.069*
			(0.013)	(0.022)	(0.022)	(0.016)	(0.018)	(0.025)	(0.020)
Number of spouses	0.794	0.641	0.013	–0.013	0.071*	0.029	–0.006	0.024	0.001
	(0.440)	(0.492)	(0.019)	(0.035)	(0.029)	(0.024)	(0.025)	(0.035)	(0.030)
Household structure									
Share of members younger than 7 years	0.201 (0/148)	0.136 (0.175)	–0.017* (0.007)	–0.012 (0.011)	–0.038* (0.011)	–0.017* (0.009)	–0.015 (0.009)	0.006 (0.012)	–0.007 (0.008)
Share of male members older than 15 years	0.217 (0.124)	0.214 (0.140)	–0.013 (0.010)	0.001 (0.017)	–0.038* (0.015)	–0.026* (0.012)	0.004 (0.013)	0.003 (0.017)	–0.017 (0.013)
Share of female members older than 15 years	0.228 (0.108)	0.285 (0.147)	0.022* (0.008)	0.032* (0.015)	0.001 (0.014)	0.004 (0.011)	0.041* (0.012)	0.029 (0.015)	–0.017 (0.012)
Child characteristics									
Male (relative to female)[b/]	0.514	0.474	0.104*	0.059*	0.136*		**n.a.**	0.125*	0.096*
			(0.010)	(0.016)	(0.017)			(0.019)	(0.012)
Age in years (relative to 7 years old)[b/]									
8 years	0.148	0.122	0.135*	0.144*	**n.a.**	0.135*	0.136*	0.113*	0.137*
			(0.015)	(0.017)		(0.019)	(0.022)	(0.031)	(0.032)
9 years	0.134	0.115	0.217*	**n.a.**		0.235*	0.193*	0.247*	0.202*
			(0.013)			(0.016)	(0.021)	(0.030)	(0.034)
10 years	0.122	0.136	0.255*			0.242*	0.271*	0.285*	0.299*
			(0.013)			(0.017)	(0.020)	(0.031)	(0.036)

(*continued*)

Table A4.3. Probit Estimates of Changes in the Probability of Being Registered for School among Children Ages 7 to 14 Years Using Data from the 1999/2000 WMS/HICES (*Continued*)

	Sample mean (standard deviation)		Change in Probability that child is registered for school[a/]						
								Rural children	
Indicator	Rural sample	Urban sample	All	Children ages 7 & 8	Children ages 13 & 14	Boys	Girls	2 km or less from nearest primary school	More than 2 km from nearest primary school
11 years	0.096	0.098	0.254*			0.261*	0.245*	0.256*	0.338*
			(0.013)			(0.016)	(0.021)	(0.032)	(0.039)
12 years	0.137	0.154	0.279*			0.293*	0.257*	0.283*	0.362*
			(0.013)			(0.015)	(0.020)	(0.031)	(0.036)
13 years	0.104	0.124	0.248*			0.280*	0.201*	0.326*	0.307*
			(0.015)			(0.016)	(0.023)	(0.033)	(0.039)
14 years	0.109	0.138	0.255*		0.009	0.276*	0.229*	0.317*	0.360*
			(0.014)		(0.016)	(0.016)	(0.022)	(0.032)	(0.039)

n.r. Not reported in source.
n.a. Not applicable.
SNNPR Southern Nations and Nationalities Peoples Republic.
*Estimate is significantly different from 0 at the two-tailed 5 percent level.
Note: Descriptive statistics calculated using population weights.
a. For continuous variables, the estimates refer to the derivative of the probability of being registered for school with respect to the indicated variable, evaluated at the means of all right-hand-side variables. For dichotomous variables, they refer to the change in probability as the variable is changed from 0 to 1, while holding all other right-hand-side variables at their means; standard errors are shown in parentheses.
b. Variable has a value of 1 if the indicated condition is satisfied, and 0 otherwise. Omitted category is reference group.
c. Household resource quintiles are identified with respect to the country-wide distribution of real per adult equivalent consumption expenditure.
Source: Analysis of 1999/2000 Ethiopia Welfare Monitoring Survey (WMS) and the Household Income and Consumption Expenditure Survey (HICES), as reported in Schaffner 2003, Table A.1, and Schaffner 2004, Tables 4–7.

Table A4.4. Estimates of Changes in the Probability of Currently Attending School, Working in a "Job," or Doing Unpaid Housework in Last Seven Days, Using Data from the 1999 Labor Force Survey

	Sample mean (standard deviation)		Probability estimates[a/]					
			Rural sample ages 7–14			Urban sample ages 7–14		
Indicator	Rural sample	Urban sample	Currently attending school	Had "Job" in last 7 days	Did unpaid house-work in last 7 days	Currently attending school	Had "Job" in last 7 days	Did unpaid house-work in last 7 days
No. of observations	49,554	24,539	49,538	49,538	49,538	24,524	24,524	24,524
Dependent variables								
Currently attending school	0.312	0.83						
Had "job" in last seven days	0.428	0.114						
Did unpaid housework in last seven days	0.319	0.43						
Change in probability associated with:								
Region (relative to Amhara)[b/]								
Tigray	0.063	0.065	0.01	–0.106*	0.021	0.023	–0.009	–0.045
			(0.026)	(0.028)	(0.029)	(0.020)	(0.015)	(0.045)
Oromiya	0.421	0.338	–0.015	–0.102*	0.115*	–0.012	0.003	0.116*
			(0.018)	(0.024)	(0.024)	(0.014)	(0.012)	(0.034)
Benshangul-Gumuz	0.013	0.007	0.078*	–0.285*	0.160*	0.037	0.013	0.107
			(0.038)	(0.028)	(0.049)	(0.032)	(0.031)	(0.081)
SNNPR	0.241	0.134	–0.01	–0.158*	0.210*	–0.064*	–0.007	0.224*
			(0.018)	(0.022)	(0.023)	(0.017)	(0.011)	(0.034)
Gambella	0.002	0.006	0.204*	–0.382*	0.255*	–0.067	0.039	0.111
			(0.094)	(0.013)	(0.107)	(0.063)	(0.060)	(0.132)
Harari	0.001	0.01	0.038	–0.232*	0.189*	0.007	–0.018	0.136*
			(0.052)	(0.044)	(0.066)	(0.028)	(0.023)	(0.069)

(*continued*)

Table A4.4. Estimates of Changes in the Probability of Currently Attending School, Working in a "Job," or Doing Unpaid Housework in Last Seven Days, Using Data from the 1999 Labor Force Survey (*Continued*)

	Sample mean (standard deviation)		Probability estimates[a/]					
			Rural sample ages 7–14			Urban sample ages 7–14		
Indicator	Rural sample	Urban sample	Currently attending school	Had "Job" in last 7 days	Did unpaid house-work in last 7 days	Currently attending school	Had "Job" in last 7 days	Did unpaid house-work in last 7 days
Addis Ababa	0.001	0.3	0.037	–0.240*	0.289	0.011	–0.045*	0.01
			(0.100)	(0.077)	(0.187)	(0.022)	(0.013)	(0.066)
Dire Dawa	0.002	0.003	1.000*	1.000*	–0.998*	0.076	0.026	0.128
			(0.000)	(0.000)	(0.011)	(0.042)	(0.037)	(0.169)
Population density in *woreda*								
1,000 population per square kilometer	0.202	5.203	0.316*	0.797*	–0.214	–0.007*	0.001	–0.004
	(0.585)	(12.624)	(0.109)	(0.150)	(0.129)	(0.002)	(0.002)	(0.006)
1,000 population per square kilometer^2/100			–33.523*	–108.57*	31.07	0.013*	–0.004	0.009
			(12.804)	(17.995)	(17.134)	(0.003)	(0.003)	(0.011)
Availability of school services in *woreda*								
No. of schools with grades 1–4 per 1,000 population	0.184 (0.074)	0.159 (0.078)	0.289* (0.116)	–0.074 (0.145)	–0.205 (0.135)	0.055 (0.108)	–0.128 (0.095)	0.044 (0.271)
No. of schools with grades 5–8 per 1,000 population	0.11 (0.053)	0.108 (0.050)	–0.006 (0.139)	0.351 (0.179)	0.156 (0.162)	–0.106 (0.143)	0.212* (0.103)	0.32 (0.343)
No. of schools with grades 9–12 per 1,000 population	0.005 (0.006)	0.011 (0.011)	0.714 (0.857)	–0.57 (1.095)	1.604 (1.014)	0.332 (0.777)	–2.310* (0.674)	–3.397* (1.628)

Number of teachers per school in *woreda*								
Teachers in grades 1–4	6.507	9.797	−0.003	−0.006	0.003	−0.003	0	0.004
	(1.912)	(4.616)	(0.004)	(0.005)	(0.005)	(0.003)	(0.002)	(0.006)
Teachers in grades 5–8	5.083	9.967	0	0.015*	−0.012*	0.003	0.001	0.003
	(2.516)	(6.263)	(0.004)	(0.005)	(0.004)	(0.003)	(0.002)	(0.005)
Teachers in grades 9–12	20.742	34.014	0.001*	−0.001	0.001	0.001*	0	0
	(20.002)	(26.921)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)
Indicators of quality of school inputs in *woreda*								
Share of schools with latrines	0.43	0.44	0.061	−0.153*	0.133*	−0.011	0.017	0.062
	(0.156)	(0.134)	(0.038)	(0.062)	(0.050)	(0.032)	(0.030)	(0.075)
Share of schools with a library	0.182	0.209	0.054	−0.013	−0.032	0.166*	−0.014	−0.033
	(0.124)	(0.127)	(0.049)	(0.069)	(0.059)	(0.040)	(0.037)	(0.101)
Share of female teachers in grades 1–8	0.276	0.33	−0.064	−0.065	0.087	0.229*	−0.066	−0.173
	(0.088)	(0.096)	(0.073)	(0.102)	(0.091)	(0.060)	(0.056)	(0.148)
Share of teachers in grades	0.024	0.04	−0.273*	0.339	−0.261	0.134	0.119	0.134
1–8 with less than TTI	(0.040)	(0.048)	(0.132)	(0.176)	(0.170)	(0.113)	(0.088)	(0.266)
Share of teachers in grades 1–8 with	(0.005)	(0.030)	(0.805)	(1.340)	(1.235)	(0.307)	(0.264)	(0.761)
vocational training, BA, or MA	0.002	0.017	0.912	−0.195	−0.783	0.051	0.232	−0.471
Cluster (i.e., enumeration area) averages								
Share of other household heads	0.257	0.631	0.449*	−0.141*	0.104*	0.123*	−0.023	−0.11
in cluster who are literate	(0.131)	(0.174)	(0.041)	(0.060)	(0.053)	(0.042)	(0.032)	(0.087)
Share of other household heads in	0.01	0.216	0.338	−0.501*	0.221	0.155*	−0.076*	0.207*
cluster who have formal sector job	(0.027)	(0.148)	(0.210)	(0.224)	(0.191)	(0.042)	(0.035)	(0.090)

(*continued*)

Table A4.4. Estimates of Changes in the Probability of Currently Attending School, Working in a "Job," or Doing Unpaid Housework in Last Seven Days, Using Data from the 1999 Labor Force Survey (*Continued*)

Indicator	Sample mean (standard deviation)		Probability estimates[a/]					
			Rural sample ages 7–14			Urban sample ages 7–14		
	Rural sample	Urban sample	Currently attending school	Had "Job" in last 7 days	Did unpaid house-work in last 7 days	Currently attending school	Had "Job" in last 7 days	Did unpaid house-work in last 7 days
Share of other household heads in cluster who are jobless	0.122 (0.111)	0.237 (0.128)	0.098 (0.050)	–0.522* (0.073)	0.146* (0.061)	0.084* (0.040)	–0.182* (0.035)	0.117 (0.100)
Household head characteristics								
Male (relative to female)[b/]	0.813	0.679	–0.041*	0.02	–0.013	–0.057*	0.015*	–0.009
			(0.010)	(0.010)	(0.010)	(0.009)	(0.006)	(0.013)
Age in years	46.22	44.815	0.003*	–0.002	0	0.005*	–0.002*	0.005*
	(12.431)	(12.571)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Age^2			–0.002	0.003*	0.001	–0.004*	0.002*	–0.005*
			(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Is literate[b/]	0.25	0.629	0.086*	–0.006	0.022*	0.106*	–0.028*	0.042*
			(0.007)	(0.007)	(0.007)	(0.008)	(0.006)	(0.011)
Reports religion other than Orthodox, Catholic, Protestant, or Muslim[b/]	0.04	0.004	–0.094* (0.014)	0.042 (0.023)	–0.032 (0.018)	–0.117 (0.068)	–0.011 (0.042)	0.026 (0.058)
Has ever migrated[b/]	0.29	0.849	0.026*	–0.020*	0.017	0.022*	–0.011	0.023
			(0.008)	(0.010)	(0.009)	(0.009)	(0.007)	(0.013)
Has a formal sector job[b/]	0.01	0.217	0.145*	–0.101*	0.007	0.061*	–0.050*	0.057*
			(0.040)	(0.037)	(0.037)	(0.012)	(0.008)	(0.019)

Has no job[b/]	0.092	0.201	–0.041*	–0.047*	0.014	0.012	–0.044*	0.028*
			(0.009)	(0.011)	(0.010)	(0.009)	(0.005)	(0.012)
Household size and structure								
No. of members	6.498	6.578	0.008*	–0.009*	–0.006*	0.011*	–0.002	–0.009*
	(2.123)	(2.593)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Share of children ages 0–6 years	0.202	0.138	–0.076*	0.232*	0.105*	–0.201*	0.047*	0.149*
	(0.152)	(0.142)	(0.024)	(0.027)	(0.025)	(0.025)	(0.018)	(0.038)
Share of male adults 15 years and older	0.212 (0.125)	0.211 (0.144)	–0.116* (0.028)	0.072* (0.030)	0.041 (0.029)	–0.025 (0.030)	–0.029 (0.020)	0.101* (0.042)
Share of female adults 15 years and older	0.224 (0.108)	0.283 (0.141)	–0.009 (0.030)	0.199* (0.034)	–0.155* (0.031)	0.073* (0.030)	–0.077* (0.020)	–0.049 (0.040)
Share of adult members with formal sector job	0.004 (0.028)	0.059 (0.110)	0.357* (0.123)	–0.052 (0.156)	0.202 (0.142)	0.066 (0.055)	0.043 (0.040)	–0.085 (0.067)
Child characteristics								
Male (relative to female)[b/]	0.514	0.481	0.139*	0.225*	–0.212*	0.044*	0.047*	–0.176*
			(0.005)	(0.007)	(0.006)	(0.005)	(0.005)	(0.008)
Age in years (relative to age 7 years)								
8 years	0.151	0.123	0.096*	0.101*	0.059*	0.078*	0.015	0.082*
			(0.010)	(0.010)	(0.008)	(0.007)	(0.013)	(0.014)
9 years	0.131	0.116	0.200*	0.170*	0.118*	0.122*	0.061*	0.185*
			(0.010)	(0.010)	(0.009)	(0.006)	(0.013)	(0.013)
10 years	0.131	0.13	0.267*	0.365*	–0.004	0.138*	0.168*	0.194*
			(0.010)	(0.011)	(0.011)	(0.006)	(0.018)	(0.014)
11 years	0.085	0.099	0.314*	0.389*	–0.001	0.148*	0.218*	0.215*
			(0.011)	(0.010)	(0.012)	(0.006)	(0.020)	(0.015)

(*continued*)

Table A4.4. Estimates of Changes in the Probability of Currently Attending School, Working in a "Job," or Doing Unpaid Housework in Last Seven Days, Using Data from the 1999 Labor Force Survey (*Continued*)

Indicator	Sample mean (standard deviation) Rural sample	Urban sample	Probability estimates[a/] Rural sample ages 7–14 Currently attending school	Had "Job" in last 7 days	Did unpaid house-work in last 7 days	Urban sample ages 7–14 Currently attending school	Had "Job" in last 7 days	Did unpaid house-work in last 7 days
12 years	0.135	0.14	0.331*	0.427*	–0.008	0.146*	0.278*	0.245*
			(0.011)	(0.010)	(0.011)	(0.006)	(0.019)	(0.015)
13 years	0.104	0.13	0.341*	0.454*	–0.013	0.128*	0.321*	0.233*
			(0.011)	(0.010)	(0.012)	(0.006)	(0.021)	(0.015)
14 years	0.102	0.142	0.333*	0.482*	–0.045*	0.121*	0.355*	0.224*
			(0.012)	(0.009)	(0.012)	(0.007)	(0.021)	(0.016)
Fails to report mother alive[b/]	0.056	0.07	–0.057*	0.017	0.002	–0.071*	0.002	–0.002
			(0.011)	(0.013)	(0.011)	(0.016)	(0.009)	(0.018)
Fails to report father alive[b/]	0.12	0.162	–0.049*	0.02	–0.001	–0.053*	0.021*	0.014
			(0.009)	(0.010)	(0.009)	(0.010)	(0.007)	(0.012)
Fails to report both parents alive[b/]	0.012	0.026	–0.034	–0.013	–0.004	–0.002	–0.018	0
			(0.025)	(0.027)	(0.024)	(0.022)	(0.013)	(0.031)

a. For continuous variables, the estimates refer to the derivative of the probability of being registered for school relative to the indicated variable, evaluated at the means of all righthandside variables. For dichotomous variables, they refer to the change in probability as the variable is changed from to, while holding all other righthandside variables at their means; standard errors are shown in parentheses.

b. Variable has a value of 1 if the indicated condition is satisfied and 0 otherwise. Omitted category is reference group.

Source: Analysis of the 1999 Ethiopia Labor Force Survey, merged with data from the Ministry of Education's school census for 1999–2000; as reported in Schaffner 2003, Table B.1 and B.7

Table A4.5. Estimates of Changes in the Probability that Child has Ever Attended School Based on Data from the 2000 Ethiopia Demographic and Health Survey

	Sample mean standard deviation)		Rural sample ages 7–14[a/]			Urban sample ages 7–14[a/]		
			Regression method and probability estimates[b/]					
Indicator	**Rural sample**	**Urban sample**	**Probit**	**Probit**	**EA Fixed Effects[d/]**	**Probit**	**Probit**	**EA Fixed Effects[d/]**
No. of observations	8,387	1,828	8,387	8,387	8,387	1,828	1,826	1,828
Dependent variable: Ever attended school	0.273	0.845						
Change in probability associated with:								
Region (**relative to Amhara**)								
Tigray	0.062	0.131	–0.012	–0.018		–0.016	–0.004	
			(0.073)	(0.072)		(0.048)	(0.040)	
Afar	0.01	0.007	–0.073	–0.079		0.033*	0.035*	
			(0.053)	(0.052)		(0.013)	(0.011)	
Oromiya	0.385	0.282	–0.059	–0.064		0.038*	0.039*	
			(0.042)	(0.041)		(0.015)	(0.013)	
Somali	0.013	0.037	–0.231*	–0.236*		–0.072	–0.087	
			(0.026)	(0.025)		(0.061)	(0.065)	
Bengshangul-Gumuz	0.011	0.007	0.074	0.068		0.021	0.021	
			(0.052)	(0.051)		(0.022)	(0.020)	
SNNPR	0.232	0.122	0.012	0.001		–0.014	–0.012	
			(0.051)	(0.050)		(0.043)	(0.039)	
Gambella	0.002	0.004	0.227*	0.230*		0.027	0.032*	
			(0.075)	(0.077)		(0.019)	(0.014)	
Harari	0.001	0.007	0.149*	0.123		0.047*	0.047*	
			(0.067)	(0.066)		(0.012)	(0.010)	

(*continued*)

Table A4.5. Estimates of Changes in the Probability that Child has Ever Attended School Based on Data from the 2000 Ethiopia Demographic and Health Survey (*Continued*)

	Sample mean standard deviation)		Rural sample ages 7–14[a/]			Urban sample ages 7–14[a/]		
			Regression method and probability estimates[b/]					
Indicator	Rural sample	Urban sample	Probit	Probit	EA Fixed Effects[d/]	Probit	Probit	EA Fixed Effects[d/]
Addis Ababa	0	0.198				0.002	0.004	
						(0.027)	(0.025)	
Dire Dawa	0.002	0.019	–0.003	–0.012		–0.068	–0.055	
			(0.067)	(0.067)		(0.044)	(0.039)	
Household assets								
No. of rooms for sleeping	1.299	1.625	0.044*	0.043*	0.035*	0.033*	0.030*	0.016
	(0.522)	(0.723)	(0.013)	(0.013)	(0.010)	(0.012)	(0.012)	(0.013)
House has dirt floor[c/]	0.022	0.323	0.370*	0.351*	0.189*	0.027	0.02	0.019
			(0.072)	(0.073)	(0.043)	(0.015)	(0.015)	(0.022)
House has electricity[c/]	0.004	0.763	0.301*	0.304*	0.166*	0.138*	0.122*	0.250*
			(0.078)	(0.078)	(0.063)	(0.037)	(0.035)	(0.032)
House has toilet[c/]	0.08	0.711	0.096*	0.087*	0.069*	0.03	0.025	0.052*
			(0.030)	(0.030)	(0.021)	(0.018)	(0.017)	(0.022)
Household owns land[c/]	0.959	0.183	–0.031	–0.025	–0.009	–0.015	–0.013	–0.043
			(0.035)	(0.035)	(0.023)	(0.020)	(0.018)	(0.027)
Household owns animals[c/]	0.892	0.402	0.016	0.013	0.052*	0.01	0.006	0.021
			(0.019)	(0.020)	(0.015)	(0.015)	(0.014)	(0.023)
Household has cash crop[c/]	0.333	0.034	0.001	–0.003	0.01	0.049*	0.045*	0.13
			(0.019)	(0.019)	(0.014)	(0.011)	(0.011)	(0.069)

Household size and structure								
No. of members	7.139	6.85	0.003	0.002	0	–0.004	–0.004	0.001
	(2.141)	(2.459)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.004)
No. of children ages 0–6 years	0.222	0.152	–0.03	–0.03	0.017	0.05	0.054	0.032
	(0.133)	(0.133)	(0.060)	(0.060)	(0.049)	(0.067)	(0.065)	(0.081)
No. of male adults 15 years and older	0.218	0.209	–0.095	–0.11	–0.121*	0.058	0.074	–0.015
	(0.117)	(0.131)	(0.064)	(0.064)	(0.051)	(0.061)	(0.059)	(0.075)
No. of female adults 15 years and older	0.218	0.284	0.160*	0.161*	0.044	0.06	0.07	0.037
	(0.097)	(0.124)	(0.071)	(0.071)	(0.060)	(0.071)	(0.066)	(0.082)
Language of household (relative to all other languages)[c/]								
Amarigna	0.302	0.526	0.154*	0.139*	0.130*	0.063*	0.058*	0.038
			(0.048)	(0.047)	(0.032)	(0.020)	(0.020)	(0.027)
Oromigna	0.357	0.207	0.067	0.06	0.016	–0.002	–0.005	–0.016
			(0.048)	(0.047)	(0.029)	(0.015)	(0.015)	(0.031)
Tigrigna	0.062	0.142	0.038	0.019	0.114	0.058*	0.051*	0.065
			(0.078)	(0.074)	(0.074)	(0.011)	(0.011)	(0.042)
Parental characteristics								
Has no father[c/]	0.081	0.139	–0.004	–0.006	–0.026	–0.043	–0.04	–0.052*
			(0.021)	(0.021)	(0.017)	(0.023)	(0.022)	(0.024)
Mother's age in years	36.653	35.974	0.022	0.023	0.006	0.011	0.011	0.024
	(6.638)	(6.017)	(0.014)	(0.015)	(0.008)	(0.009)	(0.008)	(0.014)
Mother's age^2			0	0	0	0	0	0
			0	0	0	0	0	0
Father has completed grade 1[c/]	0.177	0.456	0.173*	0.165*	0.086*	0.040*	0.035*	0.035
			(0.022)	(0.022)	(0.014)	(0.013)	(0.013)	(0.018)
Mother has completed grade 1[c/]	0.075	0.463	0.129*	0.113*	0.045*	0.051*	0.037*	0.016
			(0.031)	(0.031)	(0.021)	(0.017)	(0.015)	(0.020)

(*continued*)

Table A4.5. Estimates of Changes in the Probability that Child has Ever Attended School Based on Data from the 2000 Ethiopia Demographic and Health Survey (*Continued*)

	Sample mean standard deviation)		Rural sample ages 7–14[a/]			Urban sample ages 7–14[a/]		
			Regression method and probability estimates[b/]					
Indicator	Rural sample	Urban sample	Probit	Probit	EA Fixed Effects[d/]	Probit	Probit	EA Fixed Effects[d/]
Mother was born in rural area[c/]	0.98	0.546	–0.181*	–0.167*	–0.092*	–0.012	–0.013	–0.016
			(0.052)	(0.052)	(0.030)	(0.013)	(0.012)	(0.017)
Father has other wives[c/]	0.159	0.065	0.01	0.007	0.01	0.02	0.016	0.083
			(0.022)	(0.022)	(0.017)	(0.022)	(0.024)	(0.058)
Mother is not father's first wife[c/]	0.076	0.035	–0.02	–0.019	–0.035	0.024	0.026	–0.058
			(0.026)	(0.026)	(0.022)	(0.022)	(0.020)	(0.072)
Child characteristics								
Male (relative to female)[c/]	0.517	0.49	0.085*	0.084*	0.084*	0.012	0.012	0.022
			(0.012)	(0.012)	(0.009)	(0.011)	(0.011)	(0.015)
Age in years (relative to age 7 years)[c/]								
8 years	0.153	0.166	0.139*	0.138*	0.077*	0.049*	0.047*	0.166*
			(0.025)	(0.025)	(0.015)	(0.010)	(0.009)	(0.028)
9 years	0.144	0.111	0.251*	0.254*	0.153*	0.061*	0.058*	0.225*
			(0.026)	(0.026)	(0.016)	(0.009)	(0.009)	(0.030)
10 years	0.126	0.141	0.332*	0.332*	0.225*	0.078*	0.074*	0.276*
			(0.028)	(0.028)	(0.016)	(0.010)	(0.010)	(0.028)
11 years	0.098	0.118	0.422*	0.422*	0.289*	0.073*	0.069*	0.287*
			(0.028)	(0.028)	(0.018)	(0.010)	(0.010)	(0.030)
12 years	0.118	0.123	0.466*	0.467*	0.320*	0.080*	0.076*	0.275*
			(0.027)	(0.027)	(0.017)	(0.011)	(0.011)	(0.029)
13 years	0.109	0.116	0.467*	0.468*	0.334*	0.079*	0.075*	0.285*
			(0.028)	(0.028)	(0.018)	(0.011)	(0.010)	(0.031)

14 years	0.091	0.109	0.480*	0.480*	0.347*	0.075*	0.070*	0.272*
			(0.031)	(0.032)	(0.019)	(0.010)	(0.010)	(0.032)
Oldest child[c/]	0.209	0.235	0.008	0.009	0.005	0.002	0.002	0.027
			(0.017)	(0.017)	(0.013)	(0.014)	(0.013)	(0.020)
Oldest son[c/]	0.337	0.352	0.016	0.016	0.01	0	0	0.005
			(0.011)	(0.011)	(0.010)	(0.010)	(0.010)	(0.016)
Youngest child[c/]	0.105	0.211	0.093*	0.091*	0.074*	0.01	0.008	0.006
			(0.022)	(0.022)	(0.017)	(0.013)	(0.013)	(0.021)
Youngest son[c/]	0.338	0.382	0.006	0.006	0.007	0.008	0.008	0.005
			(0.012)	(0.012)	(0.009)	(0.010)	(0.010)	(0.015)
Attitude variables								
Mother listens to radio[c/]	0.188	0.707		0.068*	0.050*		0.049*	0.068*
				(0.016)	(0.012)		(0.017)	(0.020)
Mother believes beating is justified for going out without husband's permission[c/]	0.629	0.407		–0.025 (0.013)	–0.027* (0.010)		–0.003 (0.012)	–0.001 (0.018)
Mother reports religion other than Orthodox, Catholic, Protestant, or Muslim[c/]	0.034	0		–0.056 (0.033)	–0.022 (0.032)			–0.333 (0.222)

EA Enumeration area, SNNPR Southern Nations and Nationalities Peoples Republic.
*Estimate is significantly different from 0 at the two-tailed 5 percent level.
a. Sample of children whose mothers responded to the questionnaire for women.
b. For continuous variables, the estimates refer to the derivative of the probability that a child has ever attended school with respect to the indicated variable, evaluated at the means of all right-hand-side variables; for dichotomous variables, they refer to the change in probability when the variable is changed from 0 to 1, while holding all other right-hand-side variables at their means. Standard errors are shown in parentheses.
c. Variable has a value of 1 if the indicated condition is satisfied, and 0 otherwise.
d. The method involves including one dummy variable for each EA (except for a reference EA). The dummy variables absorb all variation in attendance rates across EAs, allowing the estimates of household and child characteristics to be derived purely on the basis of within-EA variation.
Source: Analysis of the 2000 Ethiopia Demographic and Health Survey, as reported in Schaffner 2003, Tables C.1 and C.3.

Table A5.1. Percentage Distribution Government and Nongovernment Primary and Secondary Schools in Urban and Rural Areas by Instructional Program, Ethiopia 2001–02						
	Rural areas			Urban areas		
Level of education	Government schools	Non-government schools	Both types	Government schools	Non-government schools	Both types
Primary education						
Grades 1–4 only	45.2	44.1	45.2	16.3	16.7	16.4
Grades 5–8 only	0.2	0.9	0.2	5.0	1.5	4.2
Grades 1–4 and 5–8	54.6	55.0	54.6	78.7	81.7	79.4
Total	100.0	100.0	100.0	100.0	100.0	100.0
	(9,751)	(211)	(9,962)	(1,403)	(389)	(1,792)
Secondary education						
Grades 9–10 only	57.7	0.0	55.6	23.7	34.0	25.0
Grades 11–12 only	0.0	0.0	0.0	1.4	1.9	1.5
Grades 9–10 and 11–12	42.3	100.0	44.4	74.9	64.2	73.5
Total	100.0	100.0	100.0	100.0	100.0	100.0
	(26)	(1)	(27)	(355)	(53)	(408)

Note: Figures in parentheses refer to the number of schools in the category shown.
Source: Analysis of the 2001–02 Ethiopia School Census of the Ministry of Education.

Table A5.2. Distribution of Section Sizes by Level of Instruction, Ethiopia, 2001–02			
Level of instruction & range of section size	Distribution of section sizes by level of instruction		
	Grades 1–4	Grades 5–8	Whole cycle
Primary			
<50	14.8	33.1	16.5
50 to 69	27.0	32.9	30.9
70 to 89	31.4	23.9	32.7
90 to 109	17.4	7.8	14.0
> 110	9.3	2.2	5.9
All	100.0	100.0	100.0
Secondary			
<30	n.a.	n.a.	0.6
30 to 49	n.a.	n.a.	3.6
50 to 69	n.a.	n.a.	27.0
70 to 80	n.a.	n.a.	48.5
> 90	n.a.	n.a.	20.3
All	n.a.	n.a.	100.0
Memoranda on number of observations:			
Primary schools	11,001	6,383	11,001
Secondary schools	n.a.	n.a.	330

n.a. Not applicable.
Source: Analysis of Ministry of Education's 2001–02 school census.

Table A5.3. Average Section Sizes of Primary and Secondary Classes in Government and Nongovernment Schools by Locality and Region, Ethiopia, 2001–02

Country/locality/ region	Government schools: Grades 1–4	Government schools: Grades 5–8	Government schools: Secondary	Non-government schools: Grades 1–4	Non-government schools: Grades 5–8	Non-government schools: Secondary
Ethiopia	75.9	60.7	80.4	61.9	54.8	51.1
By locality						
Urban	74.4	71.1	81.4	55.1	55.1	51.0
Rural	76.1	58.5	66.0	74.4	53.8	59.7
By region						
Tigray	66.8	59.3	80.4	53.4	42.5	68.7
Afar	37.6	29.6	67.1	33.8	—	—
Amhara	78.0	61.0	76.0	55.8	54.9	50.9
Oromiya	75.6	60.4	77.5	68.1	49.4	56.9
Somali	—	—	—	—	—	—
Benshangul-Gumuz	55.4	51.0	61.0	47.3	—	—
SNNPR	84.4	63.5	87.9	74.8	63.1	30.7
Gambella	54.7	49.2	54.6	54.7	—	—
Harari	52.2	46.3	78.0	32.7	28.4	24.3
Addis Ababa	61.5	66.8	101.5	54.9	56.4	48.9
Dire Dawa	58.2	50.4	77.1	52.6	51.7	60.0

— No data available.
SNNPR Southern Nations and Nationalities Peoples Republic.
Source: Analysis of Ministry of Education's 2001–02 Ethiopia school census.

Table A5.4. Regression Estimates of the Relation between Numbers of Teachers and Pupils across Primary and Secondary Schools, Ethiopia, 2001–02

	Government schools				Other schools			
	Primary schools			Secondary schools	Primary schools			Secondary schools
Regressor	Grades 1–8	Grades 1–4	Grades 5–8	(grades 9–12)	Grades 1–8	Grades 1–4	Grades 5–8	(grades 9–12)
Pupils	0.016	0.012	0.018	0.009	0.015	0.011	0.016	0.007
	(164.73)**	(91.58)**	(132.49)**	(26.86)**	(31.96)**	(18.82)**	(30.84)**	(2.37)*
Tigray	–27.396	–14.52	–16.202	–4.694	–6.191	–2.759	–3.116	0.909
	(36.96)**	(28.43)**	(30.55)**	–1.86	(5.52)**	(3.59)**	(3.67)**	–0.42
Afar	–22.684	–12.45	–11.146	–3.267	–7.519	–3.496	0	0
	(25.11)**	(19.89)**	(12.68)**	–0.71	(2.91)**	(1.99)*	(.)	(.)
Amhara	–27.444	–14.913	–15.197	0.923	–6.699	–3.267	–3.119	–5.052
	(38.07)**	(30.08)**	(30.08)**	–0.4	(5.94)**	(4.27)**	(3.70)**	–1.54
Oromiya	–26.905	–15.24	–13.912	0.176	–6.364	–3.555	–1.934	–2.007
	(37.46)**	(30.86)**	(27.76)**	–0.08	(10.62)**	(8.90)**	(4.74)**	–1.19
Benshangul-Gumuz	–25.053	–12.983	–15.455	–0.551	–8.679	–4.54	0	0
	(30.88)**	(23.21)**	(19.89)**	–0.15	(3.36)**	(2.59)**	(.)	(.)

SNNPR	–26.999	–15.186	–14.14	–1.749	–8.01	–4.344	–3.296	1.481
	(37.45)**	(30.62)**	(27.98)**	–0.75	(12.22)**	(9.83)**	(7.47)**	–0.55
Gambella	–22.174	–12.008	–11.028	–1.683	–8.852	–4.72	0	0
	(23.85)**	(18.67)**	(12.97)**	–0.3	–1.56	–1.22	(.)	(.)
Harari	–10.997	–4.596	–2.817	34.843	4.188	1.587	0.981	3.202
	(9.16)**	(5.36)**	(2.81)**	(6.32)**	–1.91	–1.06	–0.67	–0.7
Dire Dawa	–20.997	–10.554	–10.477	44.607	–4.577	–1.486	–3.206	–3.094
	(18.41)**	(13.33)**	(9.49)**	(4.91)**	(2.92)**	–1.39	(3.05)**	–0.95
Constant	26.244	15.78	15.417	9.428	9.356	5.888	5.2	8.076
	(35.88)**	(31.22)**	(30.36)**	(3.96)**	(17.24)**	(16.30)**	(16.05)**	(6.58)**
Observations	11,122	11,022	5,939	372	600	592	437	53
R^2	0.76	0.5	0.79	0.75	0.74	0.48	0.76	0.2

*Regression coefficient that is statistically significant at 5 percent confidence level, **Regression coefficient that is statistically significant at the 1 percent confidence level.

SNNPR Southern Nations and Nationalities Peoples Republic.

Note: Values of t-statistics in parentheses; omitted region is Addis Ababa.

Source: Regression analysis of the Ethiopia 1994 E.C. school census.

Table A5.5. Regression Estimates of the Relation between Numbers of Teachers and Pupils in Government Primary Schools by Region, Ethiopia, 2001–02

		Regression results and related information				Simulations for a school with 700 pupils, grades 1–8	
		Coefficient on number of pupils		R^2 values			
Region	No. of observations	Grades 1–8	Grades 1–4	Grades 1–8	Grades 1–4	Number of teachers	Pupil-Teacher ratio
Ethiopia	11,122	0.017	0.012	0.715	0.44	10.9	64.2
Tigray	887	0.014	0.014	0.92	0.74	10.0	69.9
Afar	128	0.022	0.018	0.83	0.69	17.6	39.7
Amhara	2,927	0.015	0.012	0.78	0.55	9.8	71.8
Oromiya	4,417	0.017	0.011	0.72	0.44	10.7	65.1
Somali	—	—	—	—	—	—	—
Benshangul-Gumuz	266	0.013	0.011	0.78	0.47	11.3	62.0
SNNPR	2,223	0.015	0.010	0.59	0.27	10.4	67.4
Gambella	108	0.015	0.008	0.40	0.18	14.9	47.1
Harari	40	0.038	0.030	0.83	0.54	28.4	24.6
Addis Ababa	79	0.020	0.016	0.88	0.65	31.1	22.5
Dire Dawa	47	0.021	0.019	0.96	0.84	16.4	42.6

— Data not available.
SNNPR, Southern Nations and Nationalities Peoples Republic.
a. Refers to number of government primary schools offering instruction in grades 1–8; those offering only grades 1–4 are smaller by a few schools.
Source: Analysis of the Ministry of Education's 2001–02 Ethiopia school census; see Table A5.2 for complete regression results.

Table A5.6. Primary School Construction Costs, Ethiopia, 2002

Location	4-classroom building (Birr)	Cost per classroom[a] Birr	Cost per classroom[a] US$
Near Addis Ababa	242,528	60,632	7,133
South region			
Near urban center	266,781	66,695	7,847
Semiremote site	434,421	108,605	12,777
Very remote site	485,056	121,264	14,266
North region			
Accessible site	281,415	70,354	8,277
Very remote site	637,874	159,469	18,761

a. Assumes conversion rate of 8.5 Birr per US$.
Source: Coyle 2003.

Table A5.7. Number of Candidates Who Took the National Grade 8, 10, and 12 Examinations by Region, Ethiopia, circa 2000

Country/region	Grade 8 1999–2000[a]	Grade 10 2001–02	Grade 12 2001–02
Ethiopia	267,642	296,668	182,903
By Region			
Tigray	39,768	32,441	11,800
Afar	1,188	719	1,111
Amhara	42,399	26,447	29,660
Oromiya	77,472	44,034	55,374
Somali	1,921	1,205	788
Benshangul-Gumuz	1,950	1,407	1,541
SNNPR	47,721	15,949	35,361
Gambela	2,555	818	1,002
Harari	2,071	1,121	2,260
Addis Ababa	47,295	27,125	41,449
Dire Dawa	3,302	1,402	2,557

SNNPR Southern Nations and Nationalities Peoples Republic.
a. Beginning in 2000–01, regional examinations replaced the national grade 8 examination.
Source: Personal communication from the National Organization of Examinations.

Table A5.8. Results from the 2000 Ethiopia National Baseline Assessment on Grade 4 and Grade 8 Student Achievement, Ethiopia, 2000

	Grade 4			Grade 8		
Indicator	Overall	Urban	Rural	Overall	Urban	Rural
No. of sample schools	256	n.r.	n.r.	136	n.r.	n.r.
No. of students tested	10,506	n.r.	n.r.	5,099	n.r.	n.r.
No. of teachers surveyed	758	n.r.	n.r.	469	n.r.	n.r.
No. of school directors surveyed	250	n.r.	n.r.	136	n.r.	n.r.
Test scores (percentage of correct answers)						
Reading	64.3	60.5	64.5	n.a.	n.a.	n.a.
English	40.5	39.4	40.6	38.8	39.5	37.0
Mathematics	39.3	37.9	38.0	38.2	38.8	36.9
Environmental science	48.1	45.7	50.4	n.a.	n.a.	n.a.
Chemistry	n.a.	n.a.	n.a.	40.3	47.1	47.3
Biology	n.a.	n.a.	n.a.	47.2	40.4	39.3
Overall average[a]	**48.1**	**45.9**	**48.4**	**41.1**	**41.5**	**40.1**

n.r. Not reported.
n.a. Not applicable because test was not administered for the subject.
a. Simple average across all subjects.
Source: Hassen and others 2001a and 2001b.

Table A6.1. Labor Force Participation by School-Age Children, Ethiopia, 1999			
Indicator	**Ages 5–9**	**Ages 10–14**	**Ages 5–14**
Population (thousands)	8,897.4	7,163.3	16,060.7
Percentage not working	54.8	18.4	38.6
Percentage working	45.2	81.6	61.4
In domestic activities	27.1	31.3	28.9
In productive activities	18.1	50.3	32.5
Percentage working in productive activities			
Boys	24.7	61.6	41.4
Girls	11.3	38.1	23.1
Urban areas	2.4	15.7	9.4
Rural areas	19.9	56.0	35.6

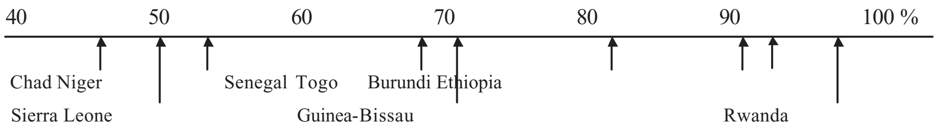
Source: Authors' estimates based on the 1999 Ethiopia Labor Force Survey (ELFS).

Table A6.2. Mincerian Earnings functions, Ethiopia, 2001					
	Whole population	**Men**	**Women**	**Urban**	**Rural**
Age	0.147	0.144	0.137	0.135	0.188
	(31.59)**	(24.45)**	(16.38)**	(26.45)**	(15.69)**
Age[a/]	–0.002	–0.002	–0.001	–0.001	–0.002
	(24.25)**	(19.99)**	(11.36)**	(20.01)**	(12.35)**
Grade 1–4	0.562	0.696	0.338	0.478	0.726
	(16.78)**	(15.18)**	(6.97)**	(12.93)**	(8.30)**
Grade 5–8	0.989	1.049	0.803	0.935	1.033
	(33.76)**	(26.59)**	(18.03)**	(29.28)**	(10.64)**
Grade 9–12	1.434	1.417	1.414	1.395	1.369
	(51.70)**	(37.36)**	(34.43)**	(45.80)**	(13.28)**
Certificate	2.041	2.003	2.072	1.974	2.198
	(52.50)**	(39.60)**	(33.91)**	(46.45)**	(21.33)**
Diploma	2.148	2.119	2.121	2.105	2.315
	(53.98)**	(42.71)**	(30.13)**	(51.17)**	(8.51)**
Degree	2.652	2.579	2.767	2.610	2.912
	(45.87)**	(39.48)**	(18.68)**	(45.19)**	(5.69)**
Constant	–3.823	–3.618	–3.740	–3.574	–4.478
	(54.46)**	(38.99)**	(32.13)**	(45.35)**	(26.54)**
Number of Observations	10960	6638	4322	9271	1689
R-squared	0.54	0.50	0.55	0.53	0.49

*Regression coefficient that is statistically significant at 5 percent confidence level.
**Regression coefficient that is statistically significant at the 1 percent confidence level.
a. Refers to wage earners only aged between 10 and 65. The dependant variable is the hourly salary (including benefits) from the main job. The results reflect estimates based on a semi-logarithmic model specification; education (highest level attained) is expressed by a set of dummies variables (illiterate is the reference group)
Note: Absolute values of t-statistics in parentheses; omitted education category is no education.
Source: authors' estimates based on the 2001 Ethiopia Stand-Alone Child Labor Survey (ESACLFS).

Appendix Figures

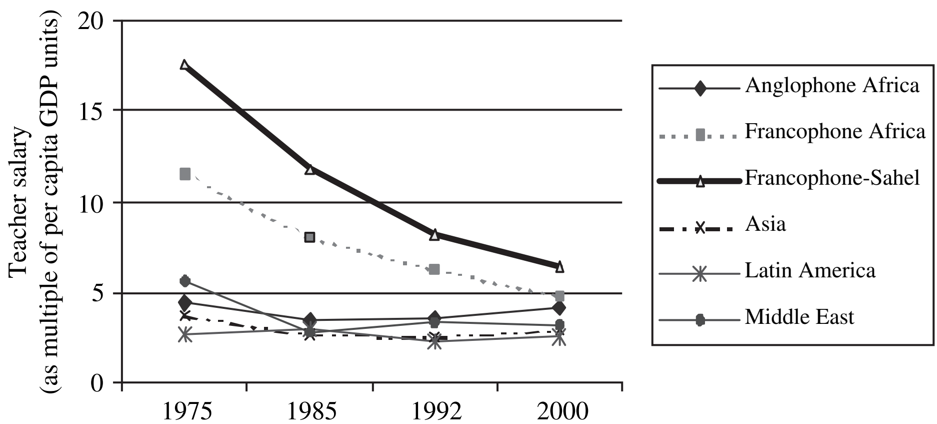
Figure A2.1. Probability of Being Literate among Adults with Six Years of Primary Schooling, Ethiopia and Other Africa Countries, circa 2000



Note: Adults refer to those ages 15–49 in Ethiopia, and ages 22–44 in all the other countries.

Source: For Ethiopia: computed from 2000 Ethiopia Demographic and Health Survey; for the other countries, computed from each country's UNICEF-sponsored Multiple Indicator Cluster Survey (MICS) survey as reported in Mingat 2003.

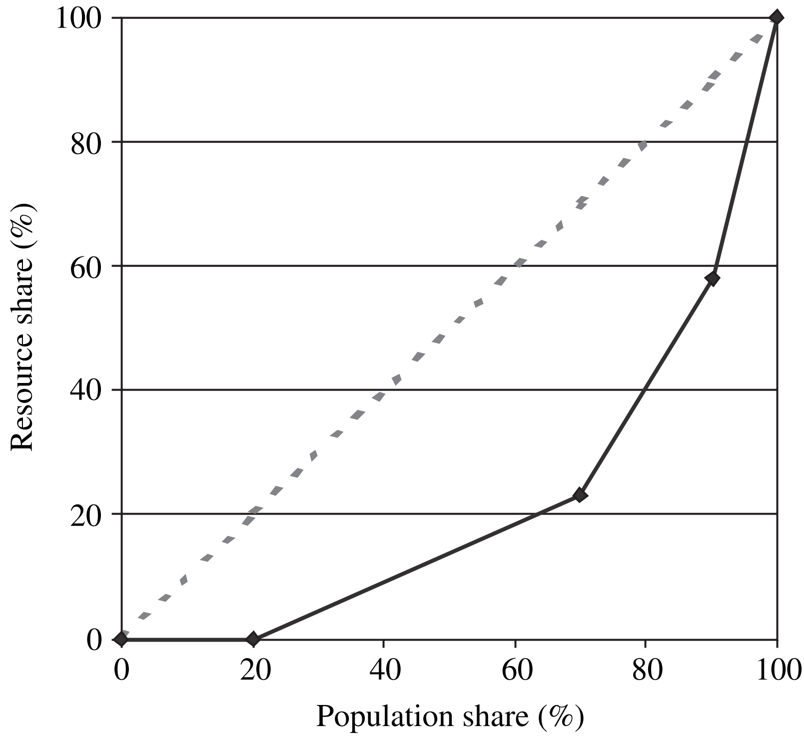
Figure A3.1. Trends in Average Teacher Salary in Primary Education, Selected World Regions, 1975–2000



GDP Gross domestic product.

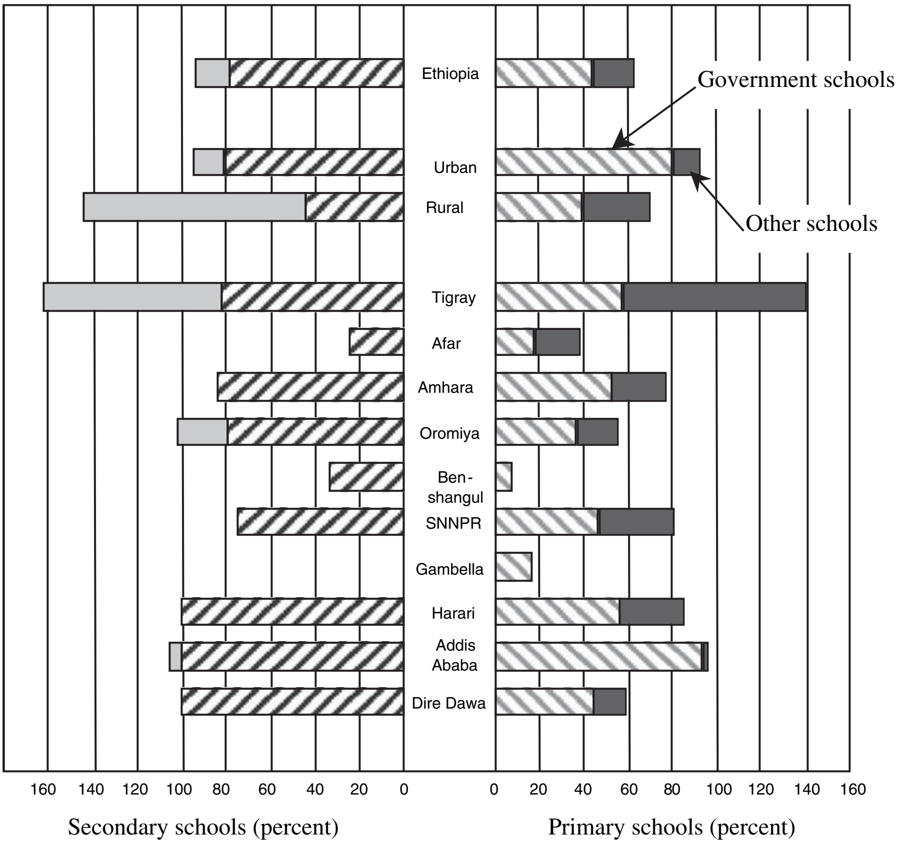
Source: Mingat 2002.

Figure A4.1. Cumulative Distribution of a Hypothetical Cohort by Education Attainment and of the Public Spending Benefiting It



Source: Authors' construction.

Figure A5.1. Percentage of Government and Nongovernment Schools Serving Two or More Shifts of Students by Locality and Region, Ethiopia, 2001–02

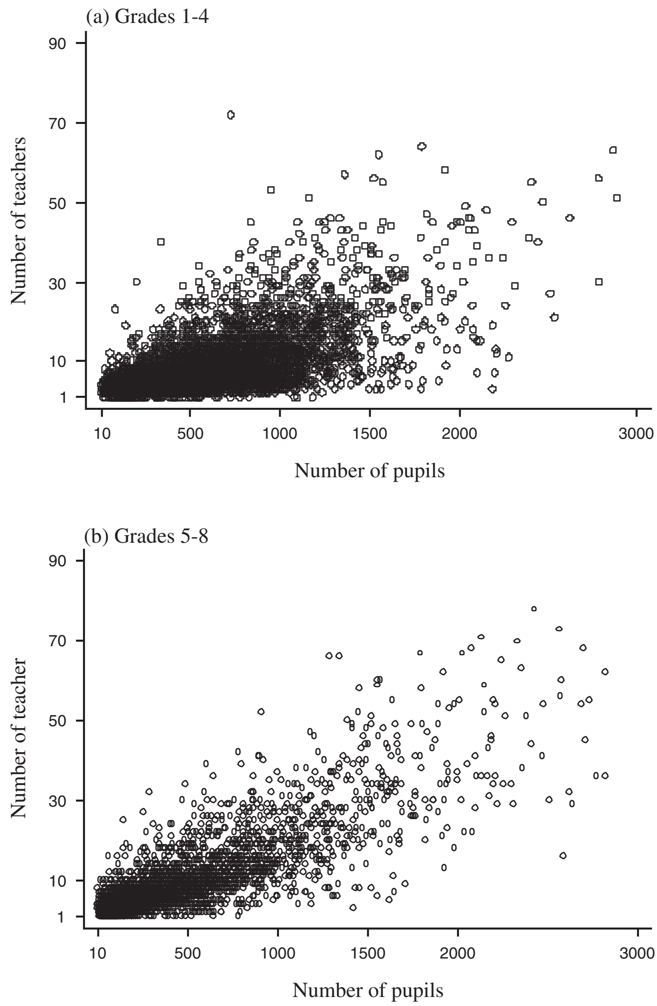


SNNPR Southern Nations and Nationalities Peoples Republic.

Note: Striped part of each bar refers to the percentage among government schools; the solid part, to the percentage among nongovernment schools; data for Somali not shown for lack of data.

Source: Analysis of the Ministry of Education's 2001–02 Ethiopia school census data.

Figure A5.2. Relation between Enrollments and Number of Teachers in Grades 1–5 and Grades 5–8 across Government Schools, Ethiopia, 2001–02



References

ADEA. 2003. Meeting Documents of the 2003 Biennale of the Association for the Development of Education in Africa (ADEA), December 3–5, Mauritius.

Ainsworth, Martha, and Deon Filmer. 2002. "Poverty, AIDS and Children's Schooling: A Targeting Dilemma." Policy Research Working Paper 2885. World Bank, Policy Research Department, Washington, D.C.

Asfaw, A., and A. Admassie. 1996. "The Impact of Education on Allocative and Technical Efficiency of Farmers: The Case of Ethiopia." *Ethiopian Journal of Economics* 5(1):1–27.

Avenstrup, Roger. 2004. "Free Primary Education and Poverty Reduction: The Case of Kenya, Lesotho, Malawi and Uganda," World Bank, Africa Region Human Development Department, Washington, D.C. Processed.

BREDA (UNESCO Regional Office for Education in Africa), World Bank, and UNESCO Institute of Statistics (UIS). 2002. "Universal Primary Education Goal For All. Statistical Document. MINEDAFVIII." Document prepared for the Eighth Conference of Ministers of Education of African Member States (MINEDAF), December 2–6, Dar-es-Salaam, Tanzania.

Bruns, B., A. Mingat, and R. Rakotomalala. 2003. *Achieving Universal Primary Education by 2015: A Chance for Every Child.* Washington, D.C.: World Bank.

Case, A. 2001. "The Primacy of Education," Research Program in Development Studies, Princeton University, Working Paper 203, Princeton, N.J.

Case, A., C. Paxson, and J. Ableidinger. 2002. "Orphans in Africa." Center for Health and Wellbeing, Research Program in Development Studies, Princeton University, Princeton, N.J. Processed.

Chiswick, B. 1988. "Interpreting the Coefficient of Schooling in the Human Capital Earnings Function." *Journal of Educational Planning and Administration* 12(2):123–130.

Christiaensen, L., and H. Alderman. 2003. *Child Malnutrition in Ethiopia: Can Maternal Knowledge Augment the Role of Income?* Washington, D.C.: World Bank.

Coyle, T. 2003. “Review of Opportunities for Lower Cost Primary School Facilities.” Report prepared for the Ethiopian Education Development Program, Ministry of Education. Final report dated December 30.

Croppenstedt, A., M. Demeke, and M. Meshi. 1999. “An Empirical Analysis of Demand for Fertilizer in Ethiopia.” *Ethiopian Journal of Agricultural Economics* 3(1):1–39.

Demeke, M. 2003. “Education and the Labour Market.” Background paper for this report. Addis Ababa, Ethiopia. Processed.

Demery, Lionel. 2000. “Benefit Incidence: A Practitioner’s Guide.” World Bank Africa Region, Poverty and Social Development Group, Washington D.C. Processed.

Dercon, S. 1997. “Poverty and Deprivation in Ethiopia,” Centre for the Study of African Economies, Department of Economics, Oxford University. Processed.

Easterly, W. 2002. “Growth in Ethiopia: Retrospect and Prospect.” Center for Global Development, Institute for International Economics, Washington, D.C. Processed.

ECORYS-NEI. 2003. “Education Unit Cost Study—Ethiopia.” Rotterdam. September 4.

Educational Quality Improvement Program (EQUIP). Undated. “Education: Implementation of Report Cards.” EQUIP2 Policy Brief. Washington, D.C.

Federal Civil Service Commission. 1994 E.C. Personnel Statistics, 1994 Ethiopian Fiscal Year. Addis Ababa: Federal Civil Service Commission.

Franz, Jutta. 2003. “Technical and Vocational Education and Training (TVET) Expenditure and Costs.” Background Paper for the 2002–03 World Bank Public Expenditure Review: Public Spending in the Social Sectors in Ethiopia. Washington, D.C. Processed.

Govt. of Ethiopia. 1994a. Basic Education Statistics. Education Management Information System (EMIS). Addis Ababa: Ministry of Education, July.

———. 1994b. E.C. Distance Education Program. Consolidated Statistics 1971–1994. E.C. Educational Media Agency. Addis Ababa: Ministry of Education.

———. 1995. *Education Statistics Annual Abstract, 1993–94.* Addis Ababa: Ministry of Education.

———. 1996. *Education Statistics Annual Abstract, 1994–95.* Addis Ababa: Ministry of Education.

———. 1997. *Education Statistics Annual Abstract, 1995–96.* Addis Ababa: Ministry of Education.

———. 1998. *Education Statistics Annual Abstract, 1996–97.* Addis Ababa: Ministry of Education.

———. 1999b. *Education Statistics Annual Abstract, 1997–98.* Addis Ababa: Ministry of Education, January.

———. 1999a. *Education Statistics Annual Abstract, 1998–99.* Addis Ababa: Ministry of Education, August.

———. 2000a. “The Federal Grant Formula.” Addis Ababa: Ministry of Finance and Economic Development, March.

———. 2000b. *Alternative Routes to Basic Primary Education.* Addis Ababa: Ministry of Education, September.

———. 2000c. *Education Statistics Annual Abstract, 1999–2000.* Addis Ababa: Ministry of Education.

———. 2000d. “Guidelines for Organization of Educational Management, Community Participation and Educational Finance.” Addis Ababa: Ministry of Education, August.

———. 2001. *Education Statistics Annual Abstract 2000–01.* Addis Ababa: Ministry of Education.

———. 2002a. “Poverty Reduction Strategy Paper.” Addis Ababa: Welfare Monitoring Unit, Ministry of Finance and Economic Development, August.
———. 2002b. “Poverty Profile in Ethiopia.” Analysis Based on the 1999/00 HICE and WM Survey Results. Addis Ababa: Welfare Monitoring Unit, Ministry of Finance and Economic Development, March.
———. 2002c. *Education Statistics Annual Abstract, 2001–02.* Addis Ababa: Ministry of Education.
Govt. of Ethiopia and ORC Macro. 2001. “Ethiopia Demographic and Health Survey 2000.” Addis Ababa: Central Statistical Authority. May.
Hassen, Bedru Kedir, Daniel Zewdie, and Yohannes Afework, with William Cummings, Jennifer Spratt, and Tizazu Assare. 2001a. “Ethiopia National Baseline Assessment on Grade Eight Student’s Achievement. Executive Summary of Study Results.” Addis Ababa: National Organization of Examinations, Ministry of Education.
———. 2001b. “Ethiopia National Baseline Assessment on Grade Four Student’s Achievement. Executive Summary of Study Results.” Addis Ababa: National Organization of Examinations, Ministry of Education.
Hassen, Bedru Kedir, Daniel Zewdie Eshetie, and Yohannes Afewrok. 2001b. “Ethiopia National Baseline Assessment on Grade Eight Student’s Achievement.” Addis Ababa: National Organization of Examinations, Ministry of Education.
Hinchliffe, Keith. 2003. “Notes on the Impact of the HIPC Initiative on Education and Health Public Expenditure in African Countries.” Africa Human Development Department, World Bank, Washington, D.C. Processed.
IIZ/DVV-ETH. Various issues. “Focus on Adult and Non-Formal Education in Ethiopia.” Newsletter. Addis Ababa: Ministry of Education and IZZ/DVV-Etho (a branch of the Institute for International Cooperation of the German Adult Education Association).
Jamison, D. T., and L. J. Lau. 1982. *Farmer Education and Farm Efficiency.* Baltimore: Johns Hopkins University Press.
Kedir, Bedru, Daniel Zewdie, and Yohannes Afework. 2000. “Ethiopia National Baseline Assessment on Grade Four Pupils’ Achievement.” Addis Ababa: National Organization of Examinations, Ministry of Education.
Kengne, Valèse Mapto, and Alain Mingat. 2002. “Analyse comparative internationale de la féminisation du corps enseignant et de l’impact du sexe de l’enseignant sur la performance des systèmes éducatifs primaires en Afrique.” Paper presented at the May 23–25 Colloque Association Francophone d’Education Comparée (AFEC), Caen, France.
Krishnan, P. Undated. “Returns to Schooling in Urban Ethiopia.” Report No. 9a. Oxford: Center for the Study of African Economies, Oxford University.
Krishnan, P., T. Selassie, and S. Dercon. 1998. “The Urban Labour Market during Structural Adjustment: Ethiopia 1990–1997.” Report No. WPS98-9. Center for the Study of African Economies, Oxford University.
Lockheed, Marlaine, Adriaan Verspoor, and Associates. 1991. *Improving Primary Education in Developing Countries.* New York: Oxford University Press.
McArthur, Don. 2003. “New School Design.” Consultant report prepared for the Ethiopia Ministry of Education. Addis Ababa.
Mengistae, T. 1998. “Wage Rates and Job Queues: Does the Public Sector Overpay in Ethiopia?” Report no. WPS/98-20. Centre for the Study of African Economies, Oxford University.
Mingat, Alain. 2002. “La question de la rémunération des enseignants dans les pays africains.” Africa Region Human Development Department, World Bank, Washington, D.C. Processed.
———. 2003. “Magnitude of Social Disparities in Primary Education in Africa: Gender, Geographical Location, and Family Income in the Context of EFA.” Paper presented

at the Joint World Bank-UNESCO Workshop on Investment Options in the Framework of Education For All (EFA), June 25–27, Ouagadougou, Burkina Faso.

Mingat, Alain, and Jee-Peng Tan. 2003. "The Mechanics of Progress in Primary Education," *Economics of Education Review* 22(6):455–467.

Mingat, Alain, and Bruno Suchaut. 2000. *Les systèmes éducatifs africains: Une analyse économique comparative.* Brussels: De Boek Université.

Mingat, A., R. Rakotomalala, and J.-P. Tan. 2002. "Financing Education For All by 2015: Simulations for 33 African Countries." Africa Region Human Development Department, Working Paper, World Bank, Washington, D.C.

Poluha, Eva. 2001. "Teachers' Recruitment and Employment Conditions in Ethiopia." Annex 1. In Eric Woods, Roger Avenstrup, Abebe Bekele, Egil Froyland, Cathal Higgins, Eva Poluha, and Mekuanent Kelemu, *An Assessment of the Current State of Government Teacher Education in Ethiopia.* Study commissioned by Ireland Aid and Swedish International Development Aid (SIDA). Addis Ababa.

Psacharopoulos, George, and Robert Mattson. 1998. "Estimating the Returns to Education: A Sensitivity Analysis of Concepts and Methods." *Journal of Educational Planning and Administration* 12(3):271–287.

Rose, Pauline. 2003. "Out-Of-School Children in Ethiopia." Report for DfID Ethiopia. Input to the Joint Review Mission of the Education Sector Development Programme II. Addis Ababa. Processed.

Rosenzweig, M. R. 1995. "Why Are There Returns to Schooling?" *American Economic Review* 85(2):153–158.

Schaffner, Julie. 2003. "The Determinants of Schooling Investments among Primary School Aged Children in Ethiopia." Human Development Department, Africa Region, World Bank, Washington, D.C. Processed.

———. 2004. "The Determinants of Primary School Enrollment in Ethiopia: Evidence from Three Household Surveys." Paper presented at the Ethiopian Economics Association Annual International Conference, Addis Ababa, June 3.

Servilla, Maribel, and Donald Winkler. 2003. "Information for Accountability in Decentralized: Implementation of Report Cards." EQUIP2 Policy Brief. Washington D.C.: AED. http://www.equipe123.net/docs/c2-001.pdf.

Suleiman, A. 1995. "Evaluating the Efficiency of Farmers in Ethiopia." *Ethiopian Journal of Economics* 35(2):47–66.

Tesfaye, Z., and T. Shiferaw. 2001. "Determinants of Adoption of Maize Technologies and Inorganic Fertilizer in Southern Ethiopia." Research Report 39, Ethiopian Agricultural Research Orgnanization (EARO), Addis Ababa.

Transitional Govt. of Ethiopia. 1994. *Education Statistics, 1967/68–1992/93.* Addis Ababa: Ministry of Education.

UNESCO. 2001. "Education pour tous: Rapport de la zone Afrique Subsaharienne." ADEA Working Group on Education Statistics. National Education Statistical Information Systems (NEISS), Harare, Zimbabwe.

———. 2002. *Education For All. Is the World on Track? EFA Global Monitoring Report. 2002.* Paris.

UNESCO-UIS and OECD 2001. *Teachers for Tomorrow's Schools. Analysis of the World Education Indicators.* Paris.

———. 2002. *Financing Education—Investments and Returns. Analysis of the World Education Indicators.* Paris.

Verwimp, P. 1996. "Estimating Returns to Education in Off-Farm Activities in Rural Ethiopia." *Ethiopian Journal of Economics* 5(2):27–56.

Weir, S. 1999. "The Effect of Education on Farmer Productivity in Rural Ethiopia." Report no. WPS99-7. Centre for the Study of African Economies, Oxford University.

Weir, S., and J. Knight. 2000. "Adoption and Diffusion of Agricultural Innovations in Ethiopia: The Role of Education." Report no. WPS2000-5. Centre for the Study of African Economies, Oxford University.

Winkler, Donald R., and Alec Ian Gershberg. 2003. "Education Decentralization in Africa: A Review of Recent Policy and Practice." Africa Region, World Bank. Washington, D.C. Processed.

Wolday Amha. 1997. "Returns to Schooling in Ethiopia: The Case of the Formal Secto." *Ethiopian Journal of Economics* 6(1):87–104.

World Bank 1998. Program Appraisal Document, Report No 17739-ET. Washington, D.C.

———. 2002. *Education and Training in Madagascar. Towards a Policy Agenda for Economic Growth and Poverty Reduction.* A World Bank Country Study. Washington D.C.

———. 2003a. *Higher Education in Ethiopia.* Washington, D.C.

———. 2003b. *Africa Live Database.* Washington, D.C.

———. 2003c. *World Development Indicators.* Washington, D.C.

———. 2003d. *Education in Rwanda. Rebalancing Resources to Accelerate Post-Conflict Development and Poverty Reduction.* A World Bank Country Study. Washington, D.C.

———. 2003e. "Ethiopia: Public Expenditure Review. Public Spending in the Social Sectors: The Emerging Challenge." Africa Region, AFTP2, World Bank, Washington, D.C.

———. 2004a. *World Development Report on Making Services Work for Poor People.* Washington, D.C.

———. 2004b. *Higher Education Development for Ethiopia: Pursuing the Vision.* Africa Region Human Development Working Paper 65. Washington, D.C.

———. 2004c. "Well-Being and Poverty in Ethiopia—The Role of Agriculture, Aid and Agency." June 18 draft, 29468-ET. Poverty Reduction and Economic Management 2, Africa Region, Washington, D.C.

———. 2004d. "Ethiopia: Country Economic Memorandum: A Strategy to Stimulate and Balance Growth." June 20 draft, 28393-ET. Poverty Reduction and Economic Management 2, Africa Region, Washington, D.C.

———. 2004e. *La dynamique des scolarisations au Niger—Evaluation pour un développement durable.* Africa Region Human Development Department Working Paper 40. Washington, D.C.

World Bank and Ethiopian Ministry of Education. 2004. "Advancing Educational Development in Ethiopia: Selected Simulation Results to Inform Policy Discussion." Washington, D.C., and Addis Ababa. Processed.

World Bank and Ministry of Health. 2004. "Ethiopia: A Country Status Report on Health and Poverty." 28963-ET. Africa Region Human Development Department, Washington, D.C.

Zinash, K. Z. 2001. "An economic analysis of education, experience and earnings: The case of selected urban centers in Ethiopia." In Berhanu M., ed. *Proceedings of Governance and Sustainable Development: Promoting Collaborative Partnership.* Addis Ababa.

Eco-Audit

Environmental Benefits Statement

The World Bank is committed to preserving Endangered Forests and natural resources. We print World Bank Working Papers and Country Studies on 100 percent postconsumer recycled paper, processed chlorine free. The World Bank has formally agreed to follow the recommended standards for paper usage set by Green Press Initiative—a nonprofit program supporting publishers in using fiber that is not sourced from Endangered Forests. For more information, visit www.greenpressinitiative.org.

In 2004, the printing of these books on recycled paper saved the following:

Trees*	Solid Waste	Water	Net Greenhouse Gases	Electricity
307	14,387	130,496	28,262	52,480
*40" in height and 6-8" in diameter	Pounds	Gallons	Pounds	KWH

green press INITIATIVE

Education in Ethiopia: Strengthening the Foundation for Sustainable Progress is part of the World Bank Country Study series. These reports are published to communicate the results of the Bank's work on the economic and related conditions of member countries to governments and to the development community.

With the end of civil war in 1991, Ethiopia's government launched a New Education and Training Policy in 1994 which, by the early 2000s, had already produced remarkable results. The gross enrollment ratio rose from 20 to 62 percent in primary education between 1993-94 and 2001-02; and in secondary and higher education it increased from 8 to 12 percent and from 0.5 to 1.7 percent, respectively.

Yet, the Government can hardly afford to rest on its laurels. Primary education is still not universal, and already there are concerns about plummeting educational quality and the growing pressures to expand post-primary education. Addressing these challenges will require more resources, both public and private. Yet, money alone is insufficient. This book argues for wise tradeoffs in the use of resources—a result that will often require reforming the arrangements for service delivery. These changes, in turn, need to be fostered: a) by giving lower levels of government more leeway to adapt central standards—such as those for teacher recruitment and school construction—to local conditions, including local resource constraints, and b) by strengthening accountability for results at all levels of administration in the education system.

World Bank Country Studies are available individually or by subscription, both in print and online.

ISBN 0-8213-6226-7

THE WORLD BANK
1818 H Street, NW
Washington, DC 20433 USA
Telephone: 202 473-1000
Internet: www.worldbank.org
E-mail: feedback@worldbank.org

16226

9 780821 362266