

HOW PRO-POOR IS ETHIOPIA'S EDUCATION EXPANSION?

A benefit incident
analysis of education
since 1995/96

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Preface

This paper is one of a series of working papers published by the Young Lives Project, an innovative longitudinal study of childhood poverty in Ethiopia, India (Andhra Pradesh State), Peru and Vietnam. Between 2002 and 2015, some 2,000 children in each country are being tracked and surveyed at three to four year intervals from the age of one to fourteen. In addition, 1,000 older children in each country are being followed from the age of eight.

Young Lives is a joint research and policy initiative co-ordinated by an academic consortium – led by the University of Oxford – and Save the Children UK, incorporating both inter-disciplinary and North-South collaboration. In Ethiopia, the research component of the project is led by the Ethiopian Development Research Institute, while the policy analysis and advocacy components are led by Save the Children UK, Ethiopia.

Young Lives seeks to:

- produce long-term data on children and poverty in the four research countries
- draw on this data to develop a nuanced and comparative understanding of childhood poverty dynamics to inform national policy agendas
- trace associations between key macro policy trends and child outcomes and use these findings as a basis to advocate for policy choices at macro and meso levels that facilitate the reduction of childhood poverty
- actively engage with ongoing work on poverty alleviation and reduction, involving stakeholders who may use or be impacted by the research throughout the research design, data collection and analysis and dissemination stages
- foster public concern about, and encourage political motivation to act on, childhood poverty issues through national and international advocacy.

In Ethiopia, the project has received financial support from the UK Department for International Development and Canada's International Development Research Centre. This support is gratefully acknowledged.

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Contents

Preface	ii
Authors	iv
Acknowledgements	iv
Abstract	i
1. Introduction	2
2. Literature on benefit incidence analysis	4
2.1 Definition and measurement issues	4
2.2 International findings on BIA of education	5
3. Benefit incidence analysis	7
3.1 Trends in public expenditure on education	7
3.2 BIA data and methods	9
3.3 Patterns of education spending incidence	10
4. Conclusions and policy implications	25
References	28
Appendix A: Sectoral expenditure	31
Appendix B: Statistical tests	32

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Abstract

An important component of the Ethiopian government's poverty reduction strategy is investment in human capital. Using government audited accounts and Ministry of Education data, this paper presents the findings of a benefit incident analysis of the Ethiopian education sector, in order to assess how pro-poor public expenditure on education has been since 1995/96. Unlike prior benefit incident studies on Ethiopia, our results present a dynamic picture of changes in benefit accrued to different sub-populations over time (rural/urban location, regional states, girls and boys) at both the primary and secondary level. The paper finds that the Education Sector Development Policy has been pro-poor, pro-rural and has significantly narrowed the gender gap at the primary school level. However, in order to make further inroads into tackling wealth, gender, and regional disparities in educational access, the conclusion highlights a number of key policy challenges.

I. Introduction

Investing in human capital is one of the Ethiopian government's core poverty reduction strategies. Expenditure on education represented almost one-fifth (18.7 per cent) of annual public expenditure in 2004/05, and as such is significantly higher than that of other pro-poor sectors (health, transport, food security and agriculture). To achieve its medium-term aim of providing all children with equal access to education, the Ethiopian Education Sector Development Programme (ESDP II),¹ which is part of the government's broader Poverty Reduction Strategy framework, has paid particular attention to reducing inequalities in public education. A multi-pronged strategy with an emphasis on alternative education modalities and community involvement has been implemented. Key components include: a) devolving responsibilities to *woredas* (local governments) to manage primary and secondary education systems; b) strengthening community participation in education financing and management to ensure greater local ownership and relevance; c) implementing inexpensive alternative approaches such as low cost, single classroom and multi-grade schools; d) addressing inequalities in less developed regions, especially those with significant pastoralist communities; e) broadening the role of private primary education; and f) building the capacities of teachers and educational managers.

Combined, these initiatives have resulted in impressive changes in educational access. More than 2,000 schools have been built, and since 2000 the number of teachers trained per year has grown by 5.5 per cent. As a result, primary school enrolment has expanded rapidly – from a gross enrolment rate of 51 per cent in 1999 to 77.7 per cent in 2004/05, and a net enrolment rate of 44 per cent in 1999 to 67.8 per cent in 2004/05 (MoE, 2004).² Although secondary school enrolment rates are still low (11.7 per cent in 2003/04), the rate has almost doubled since 1997. There has also been a significant improvement in girls' primary enrolment rates (15.3 per cent per annum growth over the same period), indicating progress towards a key Millennium Development Goal (MDG) and the gender component of the Global Education for All Campaign. If such progress is sustained, Ethiopia is on track to eliminate the gender gap in primary education by 2009/10.

Given the prominent role of education in Ethiopia's national poverty strategy, it is, however, critical to evaluate whether current public expenditure patterns in education are pro-poor. Evidence from other developing countries to date has been mixed (e.g. Gafar, 2006). In the Ethiopian case, only one benefit incidence analysis (BIA) of the Ethiopian education sector has been carried out and this was limited to a single year – 2000.³ A better understanding of the extent to which educational policies benefit the poor, and whether improvements are expanding or retracting over time, is urgently required in order to design more equitable and effective policy strategies – both education-focused as well as complementary policy initiatives which may affect household demand for education (such as infrastructure development, income-generation schemes or anti-discrimination legislation). Our

1 In 1997/98, the first phase of the ESDP focused on increasing access to educational opportunities with enhanced equity, quality and relevance, especially in primary education.

2 It is important to note, however, that indicators of quality declined in most respects over the Poverty Reduction Strategy Paper period, with particular shortfalls in the numbers of qualified primary school teachers and access to textbooks, as well as increasing class sizes. These issues are discussed in another forthcoming Young Lives working paper.

3 See discussion on Seifu (2002) in Section 2.

objective is, therefore, to assess how pro-poor expenditure on education in Ethiopia has been since the initiation of the first ESDP in 1997. To do this, we conduct a BIA and assess the relative share of the public education budget at primary and secondary levels enjoyed by each wealth quintile.

Drawing on Welfare Monitoring Survey and Household Income and Consumption Expenditure (HICE) data, we estimate enrolment rates for different income quintile groups, and then public spending per student using audited Ministry of Finance (MoFED) public expenditure accounts and Ministry of Education Statistical Abstracts. The added value of our analysis is twofold. First, we disaggregate our analysis by gender, urban/rural residence and region in order to assess the extent to which geographic and gender disparities have been addressed. Second, by analysing changes over time, we are able to provide a dynamic picture of public investment in human capital development.

The paper is organised as follows. Section 2 reviews international literature on BIA, particularly with regard to education. Section 3 discusses trends in Ethiopian public education expenditure since 1997 and presents the results of our BIA. Section 4 summarises the findings and discusses policy implications.

2. Literature on benefit incidence analysis

2.1 Definition and measurement issues

In developing countries there has been an increasing focus on analysing the distributional impacts of expenditure policies on different sections of society, especially the poor and women, and their ability to access and utilise public services (Selden and Wasylenko, 1992; Filmer, 2003). Average expenditure or benefit incidence studies normally relate household data on the use of public services by different income groups of the population to average spending on those services from the public budget (Filmer, 2003). As such, BIA is a commonly used policy analysis tool (Selden and Wasylenko, 1992; Demery *et al.*, 1995; Demery, 1997, 2000; Lanjouw and Ravallion, 1998, 1999; Glick *et al.*, 2004).

When applied to education, BIA is concerned with two dimensions of inequality: differential enrolment rates among different sub-populations (e.g. girls, the poor, rural inhabitants); and unit costs for different educational sectors (primary, secondary and tertiary education). Because prices paid for public services are not usually regarded as a good indicator of benefit or value (Al Samarrai and Zaman, 2002), Glick *et al.* (2004) identify four possible ways of dealing with benefit quantification:

- calculating the average cost of provision of public education
- employing 'yes'/'no' indicators for public service use
- using demand function analysis to estimate marginal coefficients
- employing the contingent valuation method.

The most commonly used is the first option. Government spending per pupil is typically used together with household consumption and enrolment data from household surveys (Al Samarrai and Zaman, 2002). Some studies also use participation incidence – where average participation rates for a specific public programme are tabulated against household income or expenditure per person (Lanjouw and Ravallion, 1998, 1999; Seifu, 2002).⁴ This method is used in cases where unit cost data are unavailable. In such cases, it is assumed that the unit cost is the same for different groups of users of a given service – for example, poor and rich, urban and rural.

A number of important weaknesses have been identified in the conceptualisation and use of BIA (Selden and Wasylenko, 1992; Lanjouw and Ravallion, 1998; Lopez-Acevedo and Salinas, 2000; Filmer, 2003; Ablo and Reinikka, 1998 cited in Glick *et al.*, 2004; Glick *et al.*, 2004; van de Walle and Nead, 1995). Critics have noted that:

- The use of per unit subsidy is not a good indicator of the value of the public good or service provided.
- The assumption of average costs as a good proxy for marginal benefits is not theoretically sound.

⁴ According to Lanjouw and Ravallion (1999), the average participation rate is defined as the percentage of households within an expenditure or income quintile that benefit from the public programme.

- There is a false assumption that all relative prices and real incomes are fixed and benefits do not shift.
- Homogeneity cannot be assumed as programmes expand: non homogeneous participation can occur when non target groups capture programme benefits.
- The long-term impact of investment on physical capital and improvements in human resources is not considered.
- Quality differences by location are overlooked.
- Inefficiencies in budget utilisation arising during implementation of public programmes are not properly quantified.
- The results are dependent on the availability of quality and disaggregated data, which in most cases are not available in developing countries.

To address these weaknesses, several solutions have been suggested and empirically tested. In order to overcome the static nature of conventional analyses and allow for a more dynamic approach, Lanjouw and Ravallion (1999) suggest the use of marginal odds ratio of participation. In other words, in order to predict the distributional impact of increased public expenditure on education, one needs to calculate the increase in participation for a specific quintile relative to growth in total educational enrolment.

Lopez-Acevedo and Salinas (2000) suggest an alternative approach based on marginal willingness to pay for education. They analyse the impact of public spending on the average household's expenditure on education, and determine how much households would be willing to pay for their children to attend public schools. While this method is better able to conceptually tap households' perceived benefits from public education, it is both data intensive and time consuming. There are also problems relating to respondent bias to hypothetical questions (Tietenberg, 1996).

Glick *et al.* (2004) adopt an econometric demand analysis based alternative to deal with some of the limitations. They emphasise that marginal incidence is related to both policy and demand-side factors. They argue that analysts should first use econometrics to investigate demand for public services in order to understand the distributional impacts of potential policies. Controlling for age of the child and other household factors, this approach assesses not only whether households are sending their children to school, but also the total years of education received. Although a useful methodology for capturing households' abilities to pay for schooling, it is again data intensive, requiring not-necessarily-available information on household income, level of schooling per capita and fluctuations in the price of education.

As elaborated further below, we use a combination of the first and second approaches to arrive at the benefit incidences of public spending on education in Ethiopia.

2.2 International findings on BIA of education

International empirical evidence suggests that expenditure on primary education tends to be pro-poor, whereas expenditure on higher education is more likely to be pro-rich, although the precise level of education at which the rich benefit more varies across countries (Selden and Wasylenko, 1992; Filmer 2003). One possible explanation for the pro-poor nature of primary school expenditure relates to the

generally larger number of children in lower income households. Similar results were found for both urban and rural areas, although secondary education tends to be more pro-rich in rural than urban areas, due to the low participation of the rural poor. These findings are not universal however. Lopez-Acevedo and Salinas (2000) used a marginal willingness analysis approach to show that, in Mexico, the largest subsidy from public primary and lower secondary education goes to people with higher expenditure on education, mainly the non poor and those living in urban areas.

In terms of gender differences, a Cote d'Ivoire case study suggests that benefits from public spending may be unevenly distributed between males and females in each income group (quintile) (Oxaal, 1997). In all quintiles except the richest, males benefited from a greater percentage of public subsidies for primary education. Females in the poorest quintile received the lowest share of education subsidies.

In the case of Ethiopia, only one BIA of public expenditure on education and health has been conducted. Drawing on the 2000 Welfare Monitoring Survey data, Seifu (2000) used education participation rates – where participation was measured both in terms of gross and net enrolment ratios disaggregated for rural and urban areas – and marginal incidence indicators. The results of his analysis indicate that public expenditure in primary education was biased in favour of non-poor and urban areas. He found that for households within the same income ranges, expansion of primary education benefited the urban poor more than the rural poor. The opposite was true for the highest income groups, which could be related to the preference of the urban rich for private schools. However, because the analysis was carried out at one point in time only, his study was unable to capture the impact of policy changes. It is this gap that the remainder of this paper seeks to address.

3. Benefit incidence analysis

This section first discusses trends in public expenditure on education since 1997, relative to expenditure on other services to reduce poverty. It then turns to the results of our BIA which assesses both the absolute amount as well as the percentage of public expenditure enjoyed by students per quintile. In the latter case, due to data limitations, we focus on the period between 1996 and 2000.⁵ However, as both the government and donors prioritise education, and enrolment rates have risen since 2000, we hypothesise that the same broad trends that we identify have been sustained.

3.1 Trends in public expenditure on education

In order to meet the Education for All goals of ESDP II, the Ethiopian government has consistently increased education spending since 1997. Public expenditure on education increased from 1.7 billion Birr⁶ in 1997/98 to 2.28 bn Birr in 2000/01, and 3.2 bn Birr in 2004/05. The share of the education budget, as a total of GDP, also increased from 3.6 per cent in 1992/93 to 4.8 per cent in 2001/02 (except for a modest decline to 3.2 per cent in 1999/2000 due to the Ethiopian-Eritrean war – see Table A1 in Appendix A). This spending was in keeping with the ESDP I goal of increasing education's share of the budget to 4.6 per cent of GDP (Woldehanna and Eberlei, 2004). The relative importance of education is also seen in the fact that education has a higher budget share than health, transport, agriculture and food security. Expenditure on education was 12.6 per cent in 1991/92 and increased to 14.5 and 13.8 per cent in 1996/97 and 1997/98, respectively (see Table A2 in Appendix A). The trends towards increasing education expenditure continued during the first phase of Ethiopia's poverty reduction strategy – the Sustainable Development and Poverty Reduction Programme (SDPRP I). In 2004/05, education's budget share reached 18.7 per cent, close to its targeted level of 19 per cent (see Table 1).

Table 1: Share of government expenditure during SDPRP 1 period (as a percentage)

Sector	2001/02	2002/03	2003/04	2004/05
Education	14.2	16.1	17.2	18.7
Health	5.9	4.9	4.3	4.8
Water and sanitation	2.8	2.9	2	3.4
Agriculture and food security	9.2	8.1	13.4	16
Roads	10.7	9.9	9.6	16.6
Total	42.8	41.9	49.6	59.5

Source: MoFED, 2005

Education expenditure has been particularly directed to primary education. Ministry of Education data indicate that 56 per cent of total expenditure in 1997/98 was allocated to increasing access to primary education and that this increased to 62.6 per cent in 2000/01 and 65 per cent in 2004/05 (see Table 2). This compared to just 10.7 per cent in 1997/98 and 10.1 per cent in 2004/05 for secondary

5 Although Welfare Monitoring Survey data exists for 2005, the HICE data and the audited public expenditure accounts are not yet available for researchers. Hence we were not able to directly evaluate the pro-poor nature of SDPRP I or ESDP II.

6 US\$1 = 8.72 Ethiopian Birr.

education. The remainder of total education expenditure was allocated to tertiary education – 33 per cent in 1997/98 and 25 per cent in 2003/04.

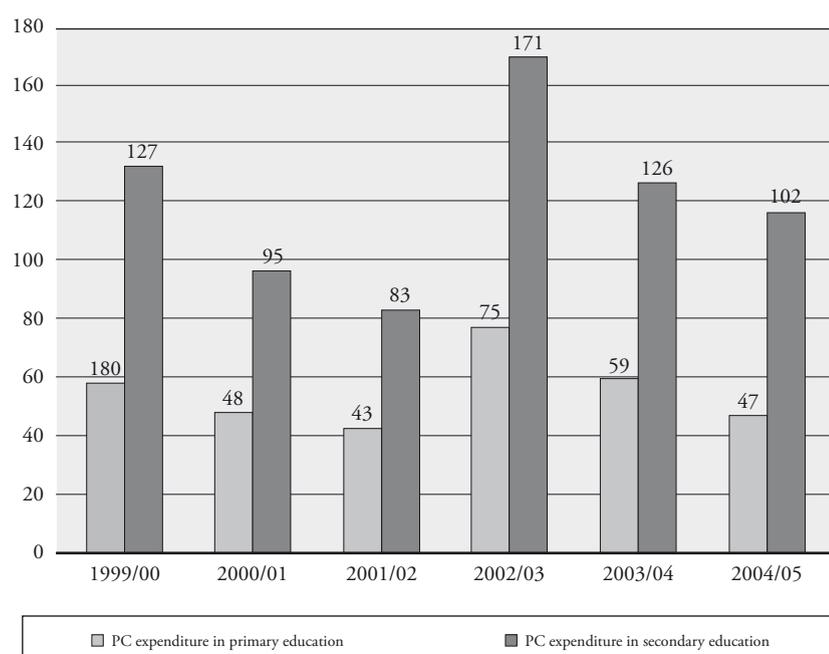
Table 2: Public expenditure on primary and secondary education

Year	Total public expenditure (Birr)	Primary school (%)	Secondary school (%)
1997/98	567,533	56	10.7
1998/99	927,923	53.3	9.8
1999/00	612,152	61.0	11.9
2000/01	570,001	62.6	12.3
2001/02	535,030	65.6	11.8
2002/03	1,163,389	56.1	9.8
2003/04	928,828	61.1	10.6
2004/05	798,083	65.0	10.1

Source: Ministry of Education (2000, 2002, 2003, 2004, and 2005a) and own calculation

Nevertheless, although the total budget allocated for education increased, expenditure per student – both primary and secondary – declined (see Figure 1). In 1999/2000, per capita expenditure on primary and secondary education was 58 Birr and 127 Birr, respectively, but by the end of the SDPRP period, spending per student had fallen to 47 Birr for primary and 102 Birr for secondary education. The reason for this decline can largely be attributed to the large and rapid expansion of primary and secondary enrolment.

Figure 1: Per capita expenditure in primary and secondary education (Birr per year)



Source: MoE, 2000, 2002, 2003, 2004, and 2005a)

3.2 BIA data and methods

To assess the BIA of the Ethiopian education sector⁷ we draw on three main sources of data. First, for information on enrolment by wealth categories, we rely on the Central Statistical Authority (CSA) Household Welfare Monitoring Survey for 1996, 1998 and 2000.⁸

Second, in order to compute the educational unit cost per student, we began by separately computing expenses for primary school, secondary school and higher education from MoFED data (1992/03 to 2000/01).⁹ We also factored in the proportion of expenditure received by primary and secondary schools from additional aggregate budget heads detailed in the published government accounts (administration and general services, adult and special education, education mass media, education building construction, curriculum, research and study). In total, these budget heads account for 13 per cent of the primary and secondary education budget in 1995/96 and 23 per cent in 1999/2000.¹⁰

Third, we then calculated the number of students enrolled in primary and secondary education by region for 1996, 1998 and 2000 from the Ministry of Education's Annual Statistical Abstracts (MoE, 2000–04). Finally, in order to calculate the unit cost (spending per student) of primary and secondary education, we divided the budget data by the student population. We employed a simple 0/1 indicator of service use, multiplied by a unit cost, to proxy the benefit per student from public education spending.¹¹ In other words, we consider that a child benefits from public expenditure on education if s/he is enrolled in school.¹²

7 We are not considering private school enrolment or individual private expenditure on education.

8 Focusing on multiple non-income dimensions of poverty, the three surveys covered 910 enumeration areas in 1996, 1,808 in 1998 and 1,992 in 2000, with 12 to 25 households each, and with a total coverage of 11,569 households in 1996, 45,675 in 1998, and 26,072 in 2000, from both rural and urban areas across the country. The database covered both urban and rural areas of the country by systematically dividing the country into four categories; both urban and rural areas were divided into two groups based on their population size. Stratified two-stage sample design and a three-stage stratified sample design were used to select samples (Welfare Monitoring Survey, 1996, 1998 and 2000). Note that Household Income Consumption Survey is only available for 1996 and 2000 (and not for 1998). Because we were unable to construct a regional price index, we could not deflate the expenditure data. Instead, income quintiles from CSA data were used, which provided real per capita income data with Addis Ababa as the average. It should also be noted that even if the HICES had been available for all years, the impact would have been the same across all households and our findings unchanged.

9 These national accounts have published actual revenue and expenditure disaggregated by region up to 1994 Ethiopian Calendar (2003/04) for all sectors. The figures shown in these publications are audited by the Auditor General and reported to Parliament and government agencies.

10 Own calculation based on audited public expenditure data published by MoFED (1991/02 to 2000/01).

11 BIAs usually use one of four methods to value the public services that each group in society receives. These include the government's cost of provision, compensating variations from estimated demand functions, contingent valuation, and a simple 0/1 indicator of public service use. Given our data limitations, we opted to use a combination of a simple 0/1 indicator based on enrolment (see e.g. Glick *et al.*, 2004) and government (public) education subsidy instead of using an econometric model to properly estimate a demand equation. We assume the same unit cost for different groups of users, namely poor and rich, rural and urban, but different unit costs for different regions.

12 We realise that enrolment alone does not ensure a quality education, but ensuring access is a crucial first step in realising children's right to education.

3.3 Patterns of education spending incidence

The following analysis focuses on the share of benefits from public education expenditure by region, wealth level, urban/rural location and gender ¹³ and changes in their distribution between 1996 and 2000.

3.3.1 Regional differences

Public spending unit costs at both primary and secondary level education are unevenly distributed among regions. Less developed regions receive relatively greater benefits from public expenditure (see Table 3). The highest unit cost of primary school spending was allocated to Afar region in both 1996 and 1998 and in 2000 to Gambella, followed by Harari. Regions which benefited more from public spending on primary education include Benshangul, Gumuz, Gambella, and Somali. The distribution of benefits at the secondary school level is similar. Afar region received the highest education subsidy per student in all three years considered, closely followed by Somali, Benshangul and Gambella. Per unit public spending was the lowest in Addis Ababa region, followed by Dire Dawa and Tigray, suggesting that the ESDP is making strides in addressing regional inequalities.

Table 3: Unit cost of public spending on education (Birr), by level of education and region

Region	Primary education			Secondary education		
	1995/96	1997/98	1999/2000	1995/96	1997/98	1999/2000
Tigray	139.74	152.95	153.31	2,204.00	979.52	435.89
Afar	604.16	1,137.63	825.20	11,001.85	9,703.04	6,151.52
Amhara	219.46	180.70	139.16	723.84	660.21	582.87
Oromia	210.03	173.28	124.41	720.00	699.63	705.38
Somalia	123.57	322.15	247.04	5,220.59	9,348.95	3,363.60
Benshangul Gumuz	205.66	158.74	372.13	2,511.67	2,573.25	813.34
SNNPR	138.91	127.80	122.85	602.43	520.78	393.90
Gambella	198.27	371.92	1,382.11	2,458.52	2,124.13	1,118.23
Harari	287.20	477.28	378.46	756.21	844.38	981.35
Addis Ababa	89.68	98.73	235.07	360.33	388.27	267.56
Dire Dawa	180.33	149.48	57.22	443.75	959.10	1,333.56
Regions total	176.99	163.64	149.05	697.21	653.39	583.98

Source: Own calculation using data from MoE (2000, 2002, 2003, 2004, and 2005a), and Welfare Monitoring Survey data MoFED (1986–93).

13 This share is defined as the number of individuals (female or male) in quintile X who benefit from a particular education service (primary or secondary school), divided by the total of both male and female beneficiaries.

Although more research is clearly needed to gain a more comprehensive picture of differences in inter-regional education expenditure patterns, several important factors determining the disparities emerged from our analysis. Less developed regions are starting from a very low baseline in terms of educational infrastructure, and thus a considerable amount of funding is required to build schools. In these predominantly rural regions, private schools are less likely to have been established compared to Addis Ababa and regional towns. Given relatively lower enrolment rates in disadvantaged regions, the government has paid particular attention to expanding public school coverage so as to reduce educational access disparities among regions.

3.3.2 Wealth disparities

In order to assess differences in education expenditure by students' wealth status, we focus on income quintiles, defined based on household per capita consumption expenditure. The distribution of educational spending is skewed towards the richest two quintiles (quintiles four and five), which enjoy more than half of the total public spending on education. As depicted in Table 4, in 1996 the poorest segment of the population received only 12 per cent of the spending on primary level education, while the richest quintile enjoyed 32 per cent. This disparity increased in 1998, but distribution improved again in 2000, such that the proportion benefiting the poor rose from eight per cent to 23 per cent and that of the rich declined from 38 to 17 per cent. This increase in favour of the poorest quintile can be at least partly attributed to the commencement of ESDP I in 1997, which introduced a number of important pro-poor components. Additional schools reduced transport costs and enabled more poor students to balance work and school. Local governments also encouraged parents to educate their children, persuaded parents of drop-outs to re-enrol them, and urged communities to provide labour and/or money to school infrastructure development to help compensate for shortage of state resources (Woldehanna *et al.*, 2005a).

Table 4: Total cost of public spending on education (Birr), by level of education and quintile

	Total expenditure	Share per quintile (%)	Total expenditure	Share per quintile (%)
	Primary education		Secondary education	
Quintile	1996			
1	77,129,827	11.77	13,728,943	4.48
2	101,297,852	15.45	33,654,665	10.96
3	127,297,852	19.49	26,459,417	8.64
4	137,818,348	21.02	55,841,300	18.24
5	211,516,736	32.27	176,539,920	57.67
Total	655,504,295	100	306,134,245	100
Quintile	1998			
1	70,289,073	8.48	15,799,860	4.32
2	104,392,018	12.59	23,636,746	6.47
3	140,289,625	16.92	49,072,963	13.43
4	201,112,686	24.25	78,470,977	21.48
5	313,095,519	37.76	198,412,235	54.30
Total	829,178,920	100	365,392,781	100
Quintile				
1	220,310,747	22.60	39,614,838	9.88
2	213,094,777	21.86	48,401,576	12.07
3	195,227,963	20.03	53,343,444	13.31
4	180,722,674	18.54	107,011,571	26.69
5	165,498,378	16.98	152,515,220	38.04
Total	974,854,539	100	400,886,649	100

Source: Own calculation using data from MoE (2000, 2002, 2003, 2004, and 2005a), and Welfare Monitoring Survey data MoFED (1986–93).

Government school subsidies and household private school expenditure

The distribution of per capita government subsidies for primary and secondary school education (represented by concentration curves) mapped against the distribution of per capita household education expenditure in 1996,¹⁴ 1998 and 2000 (represented by a Lorenz curve) can be seen in Figure 2 (panels a–c). Three important trends stand out. Primary school subsidies are more equally distributed than those for secondary school in 1998 and 2000. As a proportion of total income, the

14 The Lorenz and concentration curve of 1996 was a proxy from 1998 and 2000, due to the absence of household education expenditure data at the household level.

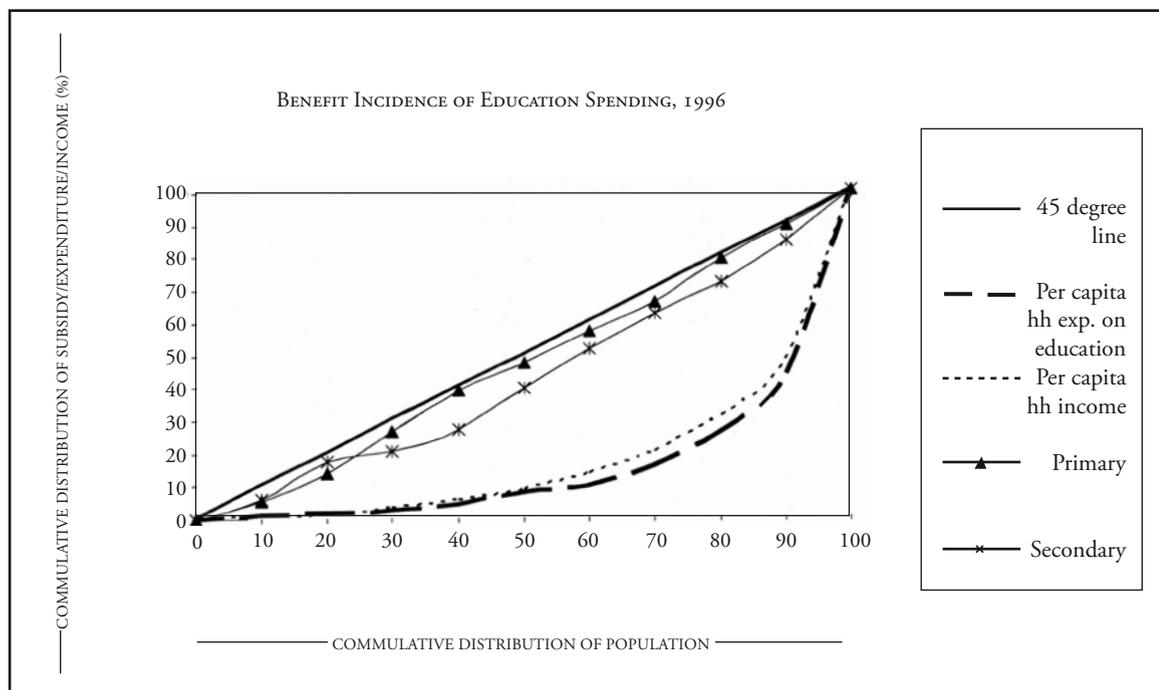
poorest gain more than the better off. Government spending lies above the Lorenz curve, indicating that public expenditure is more egalitarian than private expenditure. However, even the latter improves over the three survey years (see Table 5) suggesting that broader poverty reduction strategies are facilitating households' abilities to invest in their children's education. This pattern indicates a broad national commitment towards investing in human capital through primary school enrolment.

Table 5: Gini coefficients for total per capita household expenditure and per capita expenditure on education

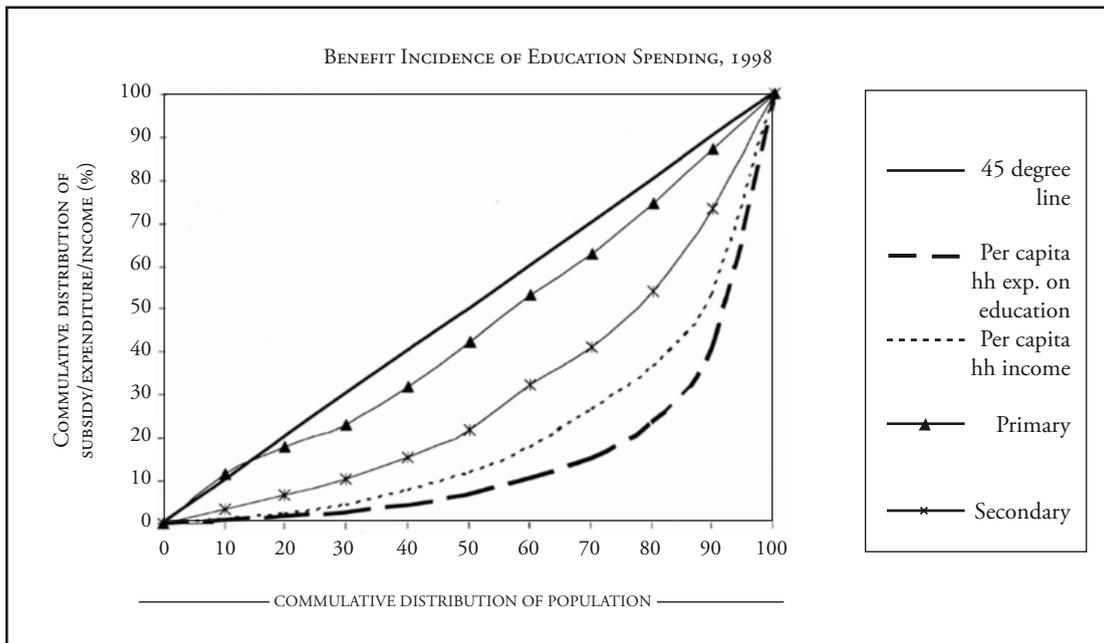
Type of expenditure	1995/96	1997/98	1999/2000
Household expenditure on schooling per person per year	0.91	0.92	0.70
Total household expenditure per capita	0.313	0.44	0.37

Figure 2: Lorenz curve showing distribution of subsidies for primary and secondary school and private per capita household expenditure on education in 1996, 1998 and 2000

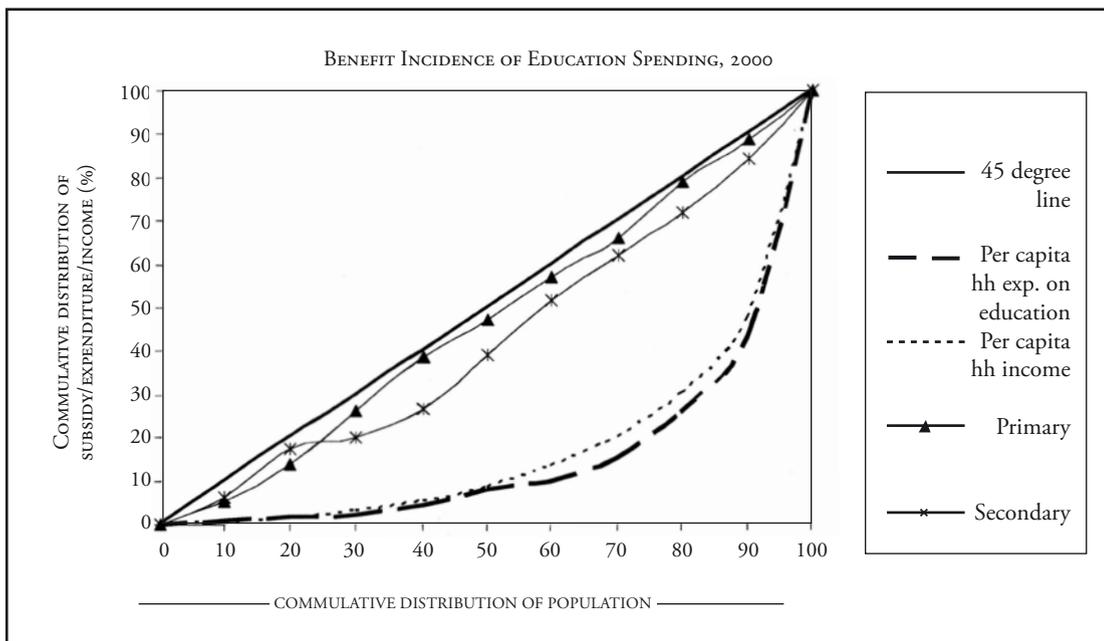
Panel (a)



Panel (b)



Panel (c)



3.3.3 Rural/urban divide

The share of primary school benefits accruing to rural areas is larger than that enjoyed by urban-based students, and the proportion was greater in 2000 than in 1996 (64 per cent compared to 72 per cent – see Tables 6 and 7). These figures suggest that the impact of ESDP I was pro-rural. Nevertheless, it is important to remember that the absolute impact remains pro-urban: Ethiopia's population is 83

per cent rural, yet only 72.1 per cent of the benefits derived from public expenditure on education are enjoyed by rural households.

Within both rural and urban areas, primary education benefits were unequally distributed by wealth quintile. The richest quintile in rural areas benefited twice as much as the poorest (24 per cent compared to 12 per cent) and the richest urban group received 46 per cent of total spending compared with just 11 per cent for the poorest quintile. This trend changed only slightly over time, worsening in 1998 but improving again by 2000.

Secondary education spending is dramatically biased in favour of urban students, urban areas taking almost all of the benefits (96–99 per cent) in the three years studied. Spending across quintiles is yet again distributed unevenly. The poorest segments in both urban and rural areas get less than ten per cent (eight per cent in rural and four per cent in urban) of the total benefit, while the richest segments enjoy the lion's share (62 per cent in rural and 59 per cent in urban). Although disparities increased in 1998, by 2000 these had declined slightly among both rural and urban populations.

Table 6: Distribution of public subsidies on education by level and quintile, rural areas (1996, 1998, and 2000)

	Total expenditure	Share per quintile (%)	Share relative to total students (%)	Total expenditure	Share per quintile (%)	Share relative to total students (%)
	Primary education			Secondary education		
Quintile	1996					
1	49,103,855	11.73	63.85	271,303	12.48	0.8
2	76,569,911	18.3	73.92	–	0	0
3	93,439,510	22.33	71.19	328,948	15.13	0.53
4	97,080,354	23.2	68.65	406,052	18.67	0.38
5	102,255,903	24.44	47.18	1,168,453	53.73	0.35
Total	418,449,534	100	62.47	2,174,756	100	0.34
Quintile	1998					
1	54,301,728	5.07	78.52	142,051	8.4	4.35
2	79,056,654	7.38	76.54	506,157	29.94	12.16
3	102,060,197	9.52	72	171,102	10.12	1.65
4	135,923,627	12.68	68.12	288,229	17.05	1.96
5	700,440,663	65.35	82.89	582,835	34.48	1.48
Total	1,071,782,869	100	78.88	1,690,375	100	2.36
Quintile	2000					
1	113,522,331	17.76	72.02	1,205,982	32.6	14.17
2	149,257,061	23.35	74.64	234,933	6.35	2.28
3	146,559,135	19.8	68.69	524,627	14.18	4.14
4	136,918,623	21.42	64.28	1,267,632	34.27	5.24
5	112,944,737	17.67	51.35	466,269	12.6	1.16
Total	639,201,887	100	65.57	3,669,442	100	3.86

Source: Own calculation from Welfare Monitoring Survey 1996, 1998, 2000

Table 7: Distribution of public subsidies on education by level and quintile, urban areas (1996, 1998, and 2000)

	Total expenditure	Share per quintile (%)	Share relative to total students (%)	Total expenditure	Share per quintile (%)	Share relative to total students (%)
	Primary education			Secondary education		
Quintile	1996					
1	27,805,889	11.06	36.15	33,630,100	5.28	99.2
2	27,009,112	10.74	26.08	103,724,961	16.28	100
3	37,813,962	15.04	28.81	62,024,219	9.74	99.47
4	44,326,995	17.63	31.35	106,148,611	16.66	99.62
5	114,487,493	45.53	52.82	331,430,383	52.03	99.65
Total	251,443,451	100	37.53	636,958,274	100	99.66
Quintile	1998					
1	14,854,001	5.18	21.48	3,126,643	4.46	95.65
2	24,226,759	8.44	23.46	3,655,511	5.22	87.84
3	39,684,160	13.83	28	10,193,667	14.55	98.35
4	63,620,734	22.17	31.88	14,398,372	20.56	98.04
5	144,550,984	50.38	17.11	38,668,595	55.21	98.52
Total	286,936,638	100	21.12	70,042,787	100	97.64
Quintile	2000					
1	44,112,001	13.14	27.98	7,302,141	7.93	85.83
2	50,706,383	15.11	25.36	10,067,599	10.94	97.72
3	57,698,935	17.19	31.31	12,155,772	13.21	95.86
4	76,087,214	22.67	35.72	22,934,280	24.91	94.76
5	107,021,246	31.89	48.65	39,591,084	43.01	98.84
Total	335,625,780	100	34.43	92,050,875	100	96.14

Source: Own calculation from Welfare Monitoring Survey 1996, 1998, 2000

3.3.4 Gender disparities

To evaluate the share of benefit going to male and female students we disaggregated the data by gender. The figure for total primary education spending indicates that the distribution is gender unequal, with females receiving between only 36.52 per cent (1998) and 39.69 per cent (2000) of the benefit (see Table 8a), while male students enjoy the remainder (see Table 8b).

Gender disparities per wealth quintile were stark in 1996 but improved significantly by 2000. In 1996, females in the poorest quintile enjoyed 9.33 per cent compared to 34 per cent for those of the richest

quintile. The pattern was similar for boys but less pronounced (13.47 per cent versus 30.65 per cent), suggesting that girls' education is abandoned when faced with lack of resources. However, by 2000, poor girls were gaining more from public expenditure than their richer counterparts. The wealth gap for boys also significantly narrowed over time (16 per cent for the first quintile versus 22 per cent for the fifth quintile in 2000).

Table 8a: Distribution of public subsidies on education (Birr) by level and quintile, female students (1996, 1998, and 2000)

	Total expenditure	Share per quintile (%)	Share relative to total students (%)	Total expenditure	Share per quintile (%)	Share relative to total students (%)
	Primary education			Secondary education		
Quintile	1996					
1	23,659,722	9.33	30.42	5,740,018	4.98	44.39
2	41,926,835	16.53	41.59	13,673,622	11.87	36.35
3	50,707,380	19.99	39.68	15,498,134	13.46	53.26
4	49,965,944	19.7	36.07	17,473,950	15.17	33.76
5	87,421,113	34.46	41.51	62,764,645	54.51	37.79
Total	253,680,993	100	38.7	115,150,369	100	38.71
Quintile	1998					
1	23,246,866	7.68	32.79	5,176,072	4.35	33.08
2	37,277,215	12.31	35.7	7,102,102	5.96	30.84
3	50,053,461	16.53	35.55	15,601,983	13.1	32.02
4	73,396,307	24.24	36.42	24,929,172	20.93	31.54
5	118,811,374	39.24	38.15	66,297,261	55.66	33.33
Total	302,785,223	100	36.52	119,106,590	100	32.6
Quintile	2000					
1	87,630,681	22.65	47.8	11,070,498	8.73	24.88
2	84,104,074	21.74	40.65	13,502,890	10.64	25.69
3	77,874,869	20.13	41.26	19,068,973	15.03	35.14
4	70,951,745	18.34	35.65	32,750,211	25.81	32.1
5	66,385,371	17.16	33.72	50,480,687	39.79	34.22
Total	386,946,740	100	39.69	126,873,260	100	31.65

Source: Computed from Welfare Monitoring Survey 1996, 1998 and 2000.

At secondary level, gender disparities in education benefit are significant (38.71 per cent for girls and 61.29 per cent for boys in 1996) and worsen markedly over time (31.65 per cent and 68.35 per cent respectively in 2000). This pattern of male bias is also mirrored in all wealth groups, except the third

quintile in 1996, where girls derived 53 per cent of the public expenditure benefits. Disparities among girls and among boys are also dramatic. In the case of girls, the first four quintiles enjoyed less benefit than the top quintile in 1996, and although it improved over time, the top quintile still enjoyed 39 per cent of the total benefit in 2000. In the case of boys, the top quintile enjoyed an even greater advantage (56.57 per cent in 1996), but wealth differences narrowed more rapidly than in the case of girls, with the richest quintile's share falling to 35 per cent in 2000. Over the four-year period (1996–2000), the most significant beneficiaries of increased expenditure in secondary education have been poor boys.

Table 8b: Distribution of public subsidies on education (Birr) by level and quintile, male students (1996, 1998, and 2000)

	Total expenditure	Share per quintile (%)	Share relative to total students (%)	Total expenditure	Share per quintile (%)	Share relative to total students (%)
	Primary education			Secondary education		
Quintile	1996					
1	54,124,973	13.47	69.58	7,189,628	3.94	55.61
2	58,881,008	14.65	58.41	23,939,063	13.13	63.65
3	77,082,222	19.18	60.32	13,600,797	7.46	46.74
4	88,564,095	22.04	63.93	34,285,421	18.8	66.24
5	123,179,730	30.65	58.49	103,340,235	56.67	62.21
Total	401,8323,029	100	61.3	182,355,143	100	61.29
Quintile	1998					
1	47,369,852	9.05	67.21	10,469,955	4.25	66.92
2	67,129,400	12.76	64.3	15,926,445	6.47	69.16
3	90,747,817	17.24	64.45	33,125,188	13.45	67.98
4	128,138,372	24.35	63.58	54,104,370	21.97	68.46
5	192,631,585	36.6	61.85	132,632,600	53.86	66.67
Total	526,287,027	100	63.48	246,258,558	100	67.4
Quintile	2000					
1	95,713,584	16.28	52.2	33,420,037	12.2	75.12
2	122,771,432	20.88	59.35	39,054,086	14.25	74.31
3	110,869,827	18.86	58.74	35,192,370	12.84	64.86
4	128,056,953	21.78	64.35	69,290,872	25.29	67.9
5	130,485,701	22.2	66.28	97,035,852	35.42	65.78
Total	587,897,497	100	60.31	273,993,217	100	68.35

Source: Computed from Welfare Monitoring Survey 1996, 1998 and 2000.

Differences by gender in rural areas

Rural primary school benefits show a strong bias towards boys in all three survey years considered (with a slight improvement in years 1998 and 2000 towards females – see Tables 9a and b). Rural boys enjoyed 74 per cent of the benefits in 1996, 71 per cent in 1998 and 61 per cent in 2000, while their female counterparts took the remaining 26 per cent, 29 per cent and 39 per cent respectively. The trend across quintiles shows that the benefits are increasingly evenly distributed over time.

In the case of secondary school, rural girls' share of benefits relative to that of their male counterparts is less than half. This suggests that, while households are increasingly willing to invest in basic primary education for their daughters, this shift in attitude has yet to lead to greater commitment to girls' secondary education. Disparities in distribution of benefits to rural girls are stark and worsening. In the case of rural secondary school spending enjoyed by girls in 1996, the first two quintiles got no benefit whatsoever. In all three survey years the top two quintiles of girls got the bulk of the benefits, a pattern which is reinforced over time. By contrast, the share of the expenditure benefit accrued to rural boys from the top two quintiles improved dramatically from approximately 81 per cent in 1996 to 45 per cent in 2000.

Table 9a: Distribution of public subsidies on education by level and quintile, rural female (1996, 1998, and 2000)

	Total expenditure	Share per quintile (%)	Share relative to total students (%)	Total expenditure	Share per quintile (%)	Share relative to total students (%)
	Primary education			Secondary education		
Quintile	1996					
1	12,822,000	10.04	25.97	0	0	0
2	27,416,422	21.48	36.01	0	0	0.99
3	32,618,231	25.55	35.01	382,428	49.07	100
4	26,029,338	20.39	26.66	180,866	23.21	38.05
5	28,762,066	22.53	28.18	216,025	27.72	20.42
Total	28,762,066	22.53	28.18	216,025	27.72	20.42
Quintile	1998					
1	16,091,173	9.21	29.42	24,190	4.62	17.55
2	25,445,598	14.56	32.15	107,974	20.62	22.86
3	32,640,038	18.68	31.87	51,931	9.92	29.94
4	44,439,639	25.43	32.71	66,999	12.8	23.54
5	56,147,651	32.13	33.01	272,443	52.04	45.54
Total	174,764,099	100	32.23	523,537	100	31.42
Quintile	2000					
1	44,280,472	19.03	39	18,168	3.24	1.61
2	51,485,765	22.13	34.52	98,401	17.53	45.37
3	45,902,727	19.73	36.17	134,239	23.91	30.07
4	47,431,631	20.39	34.54	188,559	33.59	15.92
5	53,558,661	18.72	38.8	122,051	21.74	29.3
Total	232,659,255	100	36.4	561,417	100	16.54

Source: Computed from Welfare Monitoring Survey 1996, 1998 and 2000.

Table 9b: Distribution of public subsidies on education by level and quintile, rural male (1996, 1998, and 2000)

	Total expenditure	Share per quintile (%)	Share relative to total students (%)	Total expenditure	Share per quintile (%)	Share relative to total students (%)
	Primary education			Secondary education		
Quintile	1996					
1	36,552,997	12.57	74.03	258,938	18.56	100
2	48,727,204	16.76	63.99	0	0	99.01
3	60,543,440	20.82	64.99	0	0	0
4	71,621,637	24.63	73.34	294,534	21.11	61.95
5	73,293,165	25.21	71.82	841,887	60.33	79.58
Total	290,738,444	100	69.49	1,395,359	100	64.16
Quintile	1998					
1	38,599,380	10.51	70.58	113,632	9.94	82.45
2	53,705,472	14.62	67.85	364,321	31.88	77.14
3	69,786,899	18.99	68.13	121,505	10.63	70.06
4	91,417,983	24.88	67.29	217,589	19.04	76.46
5	113,922,654	31.01	66.99	325,854	28.51	54.46
Total	367,432,387	100	67.77	1,142,901	100	68.58
Quintile	2000					
1	69,263,999	17.04	61	1,112,223	39.26	98.39
2	97,669,436	24.02	65.48	118,475	4.18	54.63
3	81,010,902	19.93	63.83	312,218	11.02	69.93
4	89,904,220	22.11	65.46	995,867	35.15	84.08
5	68,691,584	16.9	61.2	294,505	10.39	70.7
Total	406,540,141	100	63.6	2,833,288	100	83.46

Source: Computed from Welfare Monitoring Survey 1996, 1998 and 2000.

Differences by gender in urban areas

The distribution of urban primary school benefit across gender groups is relatively egalitarian in all years under observation (54 per cent for girls as opposed to 46 per cent for boys – see Tables 10a and b). This suggests urban girls are more likely to receive their fair share of public expenditure in primary education. This may be because urban parents are more aware of the importance of education and are less concerned about their daughters' safety, as schools are closer to home. However, as in rural areas, the benefit across quintiles within urban areas is skewed towards the richest group.

Urban secondary school spending is relatively more fairly distributed among female and male students. The total distribution shows a bias towards boys (40 per cent for female and 60 per cent for male in all three years considered). Urban spending is heavily biased towards the richest group for both boys and girls, with only minimal improvements over time. In 1996 the distribution was 7.5 per cent (girls) and 4.36 per cent (boys) for the poorest quintile and 51.46 per cent (girls) and 51.01 per cent (boys) for the richest group, while in 2000 it had improved to 8.02 per cent and 43.63 per cent for girls and 7.99 per cent and 42.43 per cent for boys, respectively

Table 10a: Distribution of public subsidies on education by level and quintile, urban females (1996, 1998, and 2000)

	Total expenditure	Share per quintile (%)	Share relative to total students (%)	Total expenditure	Share per quintile (%)	Share relative to total students (%)
	Primary education			Secondary education		
Quintile	1996					
1	9,806,724	8.48	34.48	18,328,137	7.46	51.89
2	13,606,493	11.77	50.87	34,535,522	14.06	35.51
3	17,471,302	15.11	46.27	29,947,902	12.2	48.03
4	20,904,637	18.08	47.62	36,364,758	14.81	31.57
5	53,847,122	46.57	46.99	126,367,946	51.46	38.86
Total	115,636,278	100	45.99	245,544,265	100	38.65
Quintile	1998					
1	6,832,985	5.34	45.82	1,191,429	4.25	36.76
2	11,063,634	8.65	46.05	1,486,284	5.3	43.37
3	18,180,649	14.21	46.01	3,792,323	13.52	38.02
4	28,536,865	22.3	44.66	5800159	20.67	39.69
5	63,338,520	49.5	43.83	15788164	56.27	40.71
Total	127,952,652	100	44.61	28,058,361	100	40.06
Quintile	2000					
1	20,711,008	13.42	46.75	3,087,781	8.02	41.92
2	21,547,850	13.96	42.04	3,331,298	8.65	31.67
3	2,5787,283	16.71	44.66	5,761,471	14.96	49.27
4	35,784,491	23.19	47.03	9,530,825	24.74	41.53
5	50,487,288	32.72	47.51	16,807,012	43.63	42.53
Total	154,317,921	100	45.97	38,518,387	100	41.85

Source: Computed from Welfare Monitoring Survey 1996, 1998 and 2000.

Table 10b: Distribution of public subsidies on education by level and quintile, urban males (1996, 1998, and 2000)

	Total expenditure	Share per quintile (%)	Share relative to total students (%)	Total expenditure	Share per quintile (%)	Share relative to total students (%)
	Primary education			Secondary education		
Quintile	1996					
1	18,638,691	13.72	65.52	16,992,366	4.36	48.11
2	13,141,140	9.68	49.13	62,721,014	16.09	64.49
3	20,287,337	14.94	53.73	32,406,120	8.31	51.97
4	22,998,452	16.93	52.38	78,827,919	20.22	68.43
5	60,749,901	44.73	53.01	198,830,788	51.01	61.14
Total	135,815,521	100	54.01	389,779,207	100	61.35
Quintile	1998					
1	8,078,903	5.08	54.18	2,049,561	4.88	63.24
2	12,961,139	8.16	53.95	1,940,781	4.62	56.63
3	21,331,648	13.42	53.99	6,183,393	14.73	61.98
4	35,366,780	22.26	55.34	8,814,334	20.99	60.31
5	81,163,848	51.08	56.17	22,996,000	54.77	59.29
Total	158,902,318	100	55.39	41,984,069	100	59.94
Quintile	2000					
1	23,589,811	13.01	53.25	4,277,962	7.99	58.08
2	29,707,430	16.38	57.96	7,188,606	13.43	68.33
3	31,957,448	17.62	55.34	5,933,110	11.08	50.73
4	40,297,399	22.22	52.97	13,419,028	25.07	58.47
5	55,787,732	30.76	52.49	22,712,962	42.43	57.47
Total	181,339,821	100	54.03	53,531,668	100	58.15

Source: Computed from Welfare Monitoring Survey 1996, 1998 and 2000.

4. Conclusions and policy implications

Our findings suggest that the general orientation of Ethiopian primary education from 1996 to 2000 was pro-poor and pro-rural. It favoured disadvantaged regions and contributed to reducing gender inequalities. Although public spending on education is more equally distributed than private household expenditure, the distribution of the latter has also improved due to growth in enrolment among the poor. If such policy efforts continue, we can be optimistic about continuing reductions in wealth and location-based disparities in education access.

However, the ESDP has been less successful at improving equity at secondary level. Despite a doubling of the secondary school population since 1997, absolute enrolment levels are still very low and wealth, geographic and gender disparities remain considerable. There is significant need for policies to modify current allocations between primary, secondary and tertiary education, and for strategies to comprehensively shape education demand- and supply-side factors.

Budget indicators

Data on per capita expenditure is crucial. Even though the total budget allocated to education increased over the last decade, expenditure per student has been falling for both primary and secondary education. While this decline is in part linked to a rapidly expanding student population, it is important to understand links between per capita expenditure and school quality. It is also essential if the international donor community is to understand the level of resources required to meet the MDG of universal quality primary education for all and to take seriously the MDG Goal 8 on a global partnership to combat poverty. Per capita budget statistics should therefore be integrated into regular education monitoring.

Rethinking intra-sectoral priorities

Current government and donor focus on lower primary school education (Grades 1–4) would appear to be short sighted in view of gross inequalities at secondary level. Some argue that ensuring quality of education at primary school level is more urgent, as without it children will not be able to obtain sufficiently high grades to go to secondary school. Given that repetition rates in Grade 8 (the final year of primary school) in Ethiopia are significantly higher than in other grades (20 per cent for girls and 13 per cent for boys in 2002/03 compared to an overall rate of 6.7 per cent) (MoE, 2005a), it would seem that this is a real concern. However, due to low aggregate secondary school enrolment rates in rural areas, investing in the construction of secondary schools is clearly also a major issue, especially for girls as we discuss below. Accordingly, the proportion of education expenditure allocated to secondary school expansion – a mere tenth of the total – should be increased. As benefits from secondary education expenditure are disproportionately captured by rich and urban households, measures need to be taken to allow more children from poor families to access secondary education.

Community financing

In view of current national budget constraints, community financing of education may be necessary to increase educational access in the short to medium term. However, and particularly at secondary level, it is unlikely that reliance on community contributions for school construction, additional facilities and teachers' salaries will increase equity and service quality. Communities that have greater resources and/or social capital are likely to be able to contribute relatively more than those in more impoverished areas. It is thus imperative that education policies are monitored and evaluated to ensure that the ESDP's current pro-poor emphasis is sustained over time.

Gender gap

At the primary school level, our analysis suggests that girls are increasingly benefiting from public expenditure on education and that there has been a significant narrowing of the gender gap. However, the marginal costs of achieving higher additional enrolment rates should not be overlooked. The rapid rate of growth in girls' primary enrolment can in part be attributed not only to a low baseline, but also to concerted efforts by communities and local authorities to enforce the ban on early marriage, to have girl drop-outs reinstated and to initiate affirmative action programmes for girls. While these efforts are commendable, policy makers need to take measures to ensure their sustainability. Adopting a cross sectoral approach to tackle broader social factors which constrain poorer households from investing in girls' education – such as safety when travelling to and from school and reduced domestic work burdens – will be important.

The picture is much less optimistic at the secondary level. Girls' overall benefit from public expenditure fell relative to that of boys between 1996 and 2000, particularly in rural areas where the decline was over 100 per cent. Although poor girls' and boys' share of public spending on education improved over time, inter-quintile differences were still marked. This suggests that affirmative action plans for girls, targeting rural and poor households in particular, are required to tackle gender inequalities. Possible interventions could include conditional cash transfers to parents who ensure their daughters' school attendance, and tutorials to improve girls' scholastic performance, satisfaction with school and post-school employment opportunities.

Regional disparities

The ESDP has made important strides in addressing regional educational disparities by investing heavily in disadvantaged regions. However, given a very low baseline of educational enrolment in areas such as Gambella, Benshangul, Somali and Afar, more concerted action is needed to further reduce the inter-regional educational gap.

Need for further research

Once 2005 data on household expenditure and audited budget records become available, it will be important to analyse the extent to which the pro-poor and pro-rural leanings of the government's education policy have been continued or enhanced during the SDPRP period (2002–05). In order to conduct more accurate BIAs, it is vital that the Ethiopian government collect and disseminate

expenditure data disaggregated by rural/urban location and by district. Such analyses should also include an evaluation of the effects of community financing.

It must also be reiterated that educational enrolment is a necessary, but far from sufficient, condition of quality education. It will therefore be important to assess linkages between greater public investment in education and educational outcomes. Such an approach would need to consider not only school supply factors, but also broader non education factors that shape household demand for education. These might include:

- sustainable livelihood options for poor households, especially those that increase women's access to resources and in turn decision-making power within the household
- economic growth strategies that do not increase demand for child labour (paid or unpaid)
- better and more affordable healthcare to promote lower drop-out rates
- improved infrastructure, especially public transportation and sanitation facilities
- measures to address parental fears about girls' safety in, and en-route to, school.

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Appendix A. Sectoral expenditure

Table A1: Total sectoral expenditure as a percentage of GDP

Sector	Average 1980/81 - 1991/92	1992/ 1993	1993/ 1994	1994/ 1995	1995/ 1996	1996/ 1997	1997/ 1998	1998/ 1999	1999/ 2000	2000/ 2001	2001/ 2002
Road construction	–	0.7	1.5	2.2	1.8	1.8	2.3	2.2	2.5	1.7	–
Education	2.3	3.6	3.9	3.4	3.4	3.4	3.5	3.5	3.2	4.2	4.8
Health	0.7	10	1.2	1.3	1.3	1.3	1.5	1.4	0	1.8	1.9

Source: Woldehanna and Eberlei, 2004

Table A2: Percentage share of total government expenditure

	Average	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98
Industry	4.4	3.5	5.9	3.7	3.9	3.9	2.9	0.8
Agriculture	9.1	9	9.5	8.8	7.5	8.2	6.8	7.6
Natural resources usage and resettlement	4.8	3.6	6	4.9	5.5	4.6	5.1	4.1
Industry	4.4	3.5	5.9	3.7	3.9	3.9	2.9	0.8
Road Construction	0	0	0	0	0	0	0	0
Education	9.4	12.6	14.3	14.1	13.5	15.1	14.5	13.8
Health	3.2	4.5	4.9	4.9	5.1	5.3	5.8	6

Source: Woldehanna and Eberlei, 2004

Appendix B. Statistical tests

We conducted a statistical test to determine whether the share of the benefits is statistically different for the two sexes in a quintile (see results in Table B1). The test results confirmed that the absolute difference in the proportion of the benefit between the two sexes is statistically significant in net primary school enrolment in all five quintiles for the three years. This indicates that the gender gap (in absolute benefit) is still great, with boys having a greater share in net primary school enrolment.

Table B1: Statistical test for gender gap in share of beneficiaries for net primary enrolment by quintile

	1996			1998			2000			GRm	GRf
	female	male	t-stat	female	male	t-stat	Female	Male	t-stat		
1	8.96	13.03	22.2	7.91	9.54	36.55	15.84	14.91	42.33	14.4	76.79
2	16.5	14.44	24.94	12.36	13.04	44.92	19.52	22	47.24	52.4	18.3
3	19.24	18.49	28.84	16.45	17.36	53.75	19.01	19.71	48.99	6.59	-1.19
4	19.57	21.72	32.49	23.81	23.63	62.92	21.98	22.34	53.86	2.85	12.31
5	35.73	32.32	48.24	39.48	36.43	84.59	23.65	21.04	58.15	-34.9	-33.8
	100	100		100	100		100	100	100		

GRm = growth rate for male share of benefit; GRf = growth rate for female share of benefit

Source: Own calculation from Welfare Monitoring Survey 1996, 1998, 2000

We also conducted a statistical test to infer whether the shares of the benefits between the two sexes are statistically and significantly different. Table B2 shows the statistical test result for differences in proportion of net secondary school enrolment by gender for the three years considered. Accordingly, even though we found that the gender gap within a quintile is narrowing in terms of percentages, the statistical test result indicated that the proportion of net secondary school enrolment between female and male is statistically different. Furthermore, the difference in share of the benefits is larger in the higher quintiles compared to that of the lower quintiles. The trend is similar in the three years considered.

Table B2: Statistical test for gender gap in share of beneficiaries for net secondary enrolment by quintile for the three years

	1996			1998			2000			GRm	GRf
	female	male	t-stat	female	male	t-stat	Female	Male	t-stat		
1	3.89	4.85	6.93	4.04	5.19	8.49	8.19	8.51	11.18	75.46	110.54
2	9.62	13.27	9.95	6.39	7.37	10.86	10.32	13.17	13.60	-0.75	7.28
3	12.32	6.17	10.72	11.84	12.97	15.81	14.94	10.76	15.09	74.39	21.27
4	14.88	16.78	13.71	20.52	20.97	22.87	24.45	26.6	21.21	58.52	64.31
5	59.29	58.93	25.09	57.2	53.49	37.64	42.11	40.96	28.30	-30.49	-28.98
total	100	100		100	100		100	100			

GRm = growth rate for male share of benefit; GRf = growth rate for female share of benefit

Source: Own calculation from Welfare Monitoring Survey 1996, 1998, 2000

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Young Lives is an international longitudinal study of childhood poverty, taking place in Ethiopia, India, Peru and Vietnam, and funded by DFID. The project aims to improve our understanding of the causes and consequences of childhood poverty in the developing world by following the lives of a group of 8,000 children and their families over a 15-year period. Through the involvement of academic, government and NGO partners in the aforementioned countries, South Africa and the UK, the Young Lives project will highlight ways in which policy can be improved to more effectively tackle child poverty.

An important component of the Ethiopian government's poverty reduction strategy is investment in human capital. Using government audited accounts and Ministry of Education data, this paper presents the findings of a benefit incident analysis of the Ethiopian education sector, in order to assess how pro-poor public expenditure on education has been since 1995/96. Unlike prior benefit incident studies on Ethiopia, our results present a dynamic picture of changes in benefit accrued to different sub-populations over time (rural/urban location, regional states, girls and boys) at both the primary and secondary level. The paper finds that the Education Sector Development Policy has been pro-poor, pro-rural and has significantly narrowed the gender gap at the primary school level. However, in order to make further inroads into tackling wealth, gender, and regional disparities in educational access, the conclusion highlights a number of key policy challenges.

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