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Strengthening Institutions to Improve Public Expenditure Accountability

Improving Girls' Access to Secondary Schooling: A Policy Simulation for Uganda

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Abstract

Despite the successful implementation of the policy of Universal Secondary Education in Uganda in 2007, overall secondary school enrolment, especially among girls, has remained low. Among other reasons, high cost of schooling is cited as the major constraint limiting access to secondary education. Uganda's National Development Plan proposes to bring about gender equity in secondary school enrolment through the provision of bursaries/stipends to poor girls to enable them to attend school. In this study, we examine the potential impact of this policy proposal (Policy I) and compare it with the alternative of providing free transport along with the stipends (Policy II). The findings indicate that both policy proposals would generate net benefits to society, but more benefits would accrue from the provision of tuition stipends only. Compared to Policy II, Policy I is more cost-effective and therefore the preferred policy option.

Key words: Girls' secondary school enrolment; policy options.

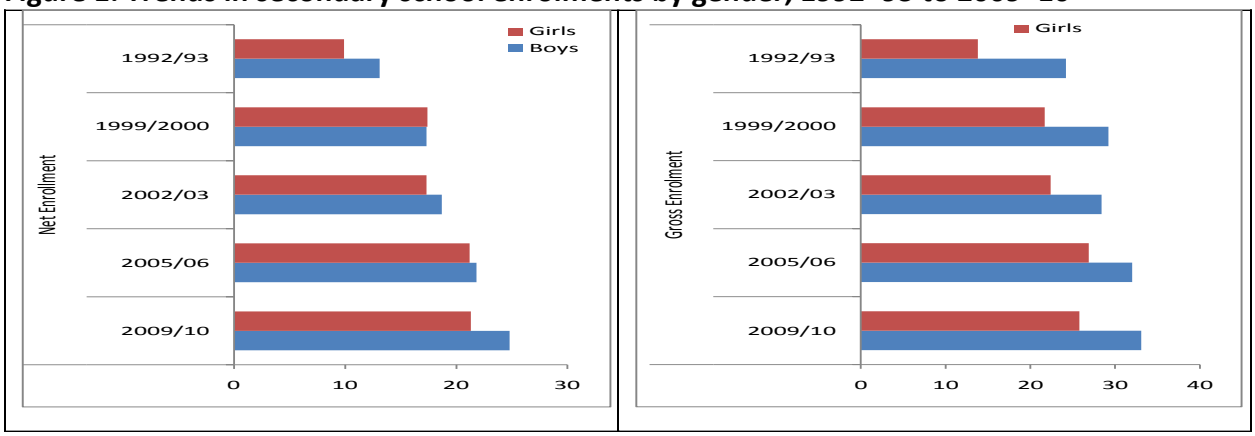
1. INTRODUCTION

Over the past 15 years, Uganda has devoted a large amount of public resources to the education sector. Although the share of this sector in the national budget reduced from 25 percent in 2000–1 to 15 percent by 2011–12, it still commands the largest share of the national budget (Ministry of Finance Planning and Economic Development [MFPED], 2012). Indeed, by 2010–11, Uganda was spending UGX 1,416 billion (US$ 547 million) on education. Most of the resources for education have been earmarked for primary education under the Universal Primary Education (UPE) program—with primary schooling accounting for 56 percent of the education budget in 2010, down from 66 percent in 2000–1 (*ibid*.). The introduction of the UPE program in 1997 led to gender parity in primary school enrolments fairly soon, by 1999 (Deininger, 2003), a situation yet to be realized after the introduction of a similar scheme targeting secondary schooling.

Uganda was among the first African countries to initiate a large-scale Universal Post-Primary Education and Training (UPPET) program in 2007. As result of this program, the population in secondary schools increased by 25 percent, while the population in business and vocational schools increased by 46 percent (Government of Uganda, 2010). The focus on post-primary education led to a reorientation of the education budget, with the secondary subsector accounting for 19 percent of public education resources in 2007–08—up from 14 percent prior to the introduction of UPPET. A number of multilateral donors such as the African Development Bank have come on board to support the UPPET program by providing funds to expand secondary school infrastructure. Nonetheless, initial assessments also point to inadequate planning, especially with regard to funding, prior to the introduction of the program. School administrators were expected to increase enrolments even before school facilities were expanded (Chapman et al., 2010). Although the Government of Uganda (GoU) devoted more resources to the expansion of post-primary schooling, concerns about gender inequality in secondary enrolment remain. For instance, the National Development Plan (NDP) notes that only one-third of girls who graduate from primary school remain in school till the age of 18 years, as compared to 50 percent for boys (GoU, 2010).

Despite the successful introduction of UPPET in 2007, overall secondary school enrolments have remained very low, especially for girls. Figure 1 shows the trends in both the net and gross secondary school enrolment rates for children aged 13 to 18 years during 1992–93 and 2009–10. It is evident that the enrolment rate for girls remained unchanged after the introduction of USE in 2007, while that of boys increased by only 3 percentage points. The figure also shows widening gender gaps in secondary school attendance. On the other hand, the GoU has devoted huge resources to secondary education in the recent past. For instance, the share of secondary education in the overall education budget increased from 14 percent in 2001–2 to 21 percent by 2010–11 (MFPED, 2011). Consequently, policymakers are examining alternative ways to increase overall secondary school enrolment, especially for girls. For instance, the current NDP 2010–15 calls for the provision of targeted bursaries for girls in order to improve gender equity in secondary school enrolments (GoU, 2010).

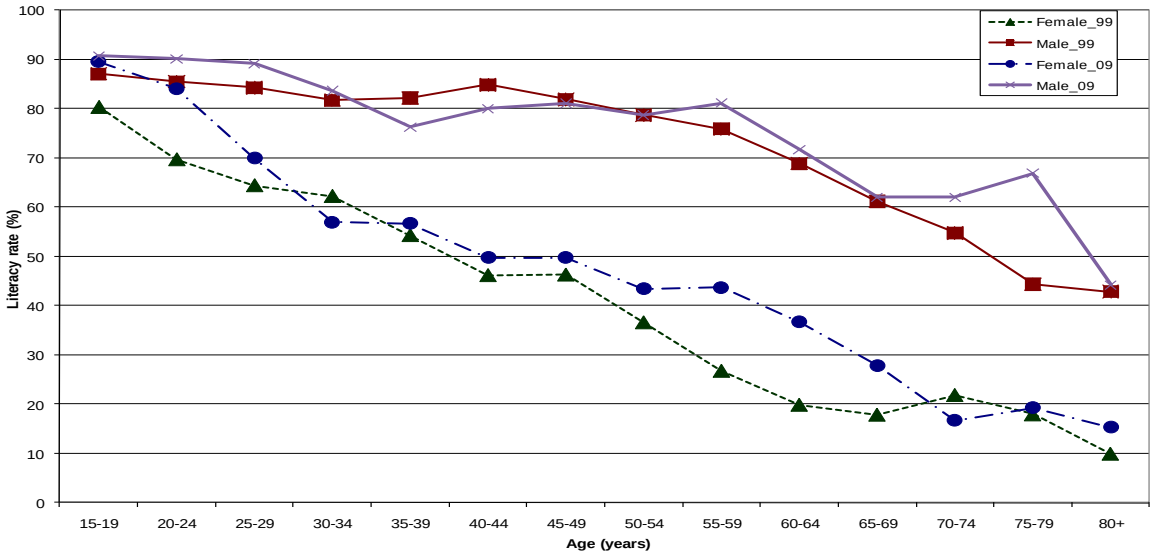
Figure 1: Trends in secondary school enrolments by gender, 1992–93 to 2009–10



Source: Author's calculations from the 1992–93 Integrated Household Survey (HIS); 1999–2000 UNHS; 2002–3 UNHS; and 2009–10 UNHS.

Further evidence of gender inequalities in education in Uganda are shown by male–female gaps in educational achievement. Figure 2 shows the trends in literacy rates (defined as the ability to read and write in any language) as captured by the Uganda National Household Surveys (UNHS) in 1999–2000 and 2009–10. It can be seen that literacy rates for females aged 15 to 24 years have significantly increased (85 percent), virtually to the level of males in the same age group. Nonetheless, there are still significant gender gaps among older age groups in level of education achieved. For instance, for individuals aged over 30 years, the gender gap in literacy rates is about 30 percentage points. However, expansion in primary school enrolment under UPE has to some extent reduced the male–female gap in educational attainment.

Figure 2: Trends in female–male literacy rates, 1999–2000 and 2009–10



Source: Authors calculations from UNHS 1999–2000 and 2009–10.

High cost remains a major reason why children cannot access secondary education in Uganda. Despite the availability of the UPPET program, most secondary schools charge tuition and other fees. This is unlike the UPE program where 75 percent of primary

schools are public schools and as such do not charge tuition fees. In the UPPET program, only 31 percent of the available secondary schools are owned by the government (Ministry of Education and Sports, 2010). With free secondary education limited to public secondary schools, the majority of Ugandans continue to pay to access secondary education. Table 1 shows the reasons for school dropout in Uganda during 2004 and 2008, based on the National Service Delivery Surveys (NSDS). It can be seen that most of the children dropping out of school are in the secondary school age category (13 to 17 years), which accounts for over 82 percent of all children who have left school. Secondly, the high cost of schooling is the most frequently cited reason for dropping out of school—32 percent in 2004 and 25 percent in 2008 for all children aged 6 to 17 years. Lack of interest—either on the part of the parent or the child—is the second most commonly cited reason for dropping out of school; this factor is most critical for boys—for instance, 24 percent of boys aged 6 to 17 years indicate pure lack of interest as the main reason.

With respect to secondary education, the USE program, unlike the UPE program, does not provide scholarships to every qualifying UPE graduate. The USE scholarships are only for students who have performed well, and that too, only if they attend particular schools. Consequently, there is a need to address the financial barriers children continue to face in accessing secondary schooling in Uganda.

Table 1: Reasons for school dropout, 2004-2008 (%)

	2004			2008		
	All	Female	Male	All	Female	Male
	All children aged 6-17 years					
High cost	32.5	31.9	33.2	25.4	22.2	28.7
Long distances	3	3.1	2.8	0.7	0.7	0.8
Orphaned	7.4	7.4	7.4	4.8	5.6	4.1
Sickness/Calamity in the family	10.5	11.5	9.1	10.2	9.8	10.2
Pregnancy/Marriage	4.1	7.1	-	4.7	8.7	-
War/Insecurity	2.5	1.9	3.1	0.9	1.1	0.9
Lack of Interest	14.6	10.7	18.9	19.3	15.5	23.6
Other reasons	8.3	9.9	7.7	13	13.1	13
Unstated reasons	16.9	16.5	17.8	21	23.3	18.7
Column Total	*100*	*100*	*100*	*100*	*100*	*100*
Estimated number of dropouts	*450,900*	*239,600*	*211,300*	*528,395*	*273,372*	*252,999*
	Children aged 13-17 years					
High cost	31.9	32	31.9	25.4	22.6	27.9
Long distance	2.8	2.8	2.7	0.6	0.6	0.5
Orphaned	7.2	7.5	7.1	4.9	5.2	4.7
Sickness/Calamity in the family	10.4	11.6	9.2	8.2	6.8	9.8
Pregnancy/Marriage	4.8	8.5	-	5.3	9.6	-
War/Insecurity	2.1	1.6	2.7	0.9	1	0.8
Lack of Interest	15.6	11.2	20.8	16.7	16.1	23.7
Other reasons	8.7	9.4	7.7	15.1	12.8	12.2
Unstated reasons	16.5	15.4	17.9	22.9	25.3	20.4
Column Total	*100*	*100*	*100*	*100*	*100*	*100*
Estimated number of dropouts	*370,901*	*198,113*	*171,691*	*456,880*	*239,163*	*217,027*

Source: Author's calculations from the 2004 and 2008 NSDS.
Notes: Dropouts are children who have previously enrolled but are currently out of school.

2. LITERATURE REVIEW

With the achievement of parity in UPE in most developing countries, the emphasis has shifted to closing the gender gap in secondary school enrolment, especially in Sub Saharan Africa (SSA). According to the World Bank, the ratio of girls to boys in secondary school in SSA was only 0.8 in 2001, although the gross enrolment rate in secondary school had increased tremendously from 18 percent in 1990 to 27 percent by 2001 (Suther-land-addy, 2008). Indeed, a number of developing countries have implemented different programs to attract girls to secondary school. For instance, Bangladesh initiated the Food for Education Program (FEP) in 1994 and the Female Stipend Program (FSP) that provided scholarships for poor girls to attend secondary school. The long-term effects of this program have been impressive; the share of female students enrolled in secondary schools increased from 5 percent in 1980 to 50 percent in 2007. The school also registered a significant increase in female teachers (Asadullah and Chaudhury, 2008).

Other countries have implemented similar schemes. In 1997, Mexico initiated the Programa de Educacion, Salud y Alimentacion (*PROGRESA-Oportunidades*), or the cash transfer scheme, targeting health and education outcomes. *PROGRESA-Oportunidades*' greatest impact has been on school enrolment, especially of girls. For instance, Behrman et al. (2005) show that the scheme reduced the dropout rate for girls and also assisted them in the transition from primary to secondary school. In Bangladesh, girls were given a scholarship for which they had to open a bank account into which the money was transferred directly. This subsidy significantly reduced child labour, as shown by Ravallion and Wodon (2000). In Pakistan, girls were provided scholarships through community grants. In Columbia, vouchers were allocated by means of a lottery due to over-subscription to the program (Angrist Bettinger, Bloom et al., 2002). Furthermore, the lottery winners in Columbia had the choice to enrol in either a public or private school, but with a cap on the cost of joining private schools. Angrist et al. (2006) also show that recipients of vouchers were more likely to complete high school. In Mexico, *Oportunidades* provided households with a relatively higher cash transfer for girls' secondary school enrolment as compared to boys. Evaluations point to this method of targeting as the reason for continued school attendance by girls even during adolescence (deBrau and Hoddinott, 2008). Research has also examined non-conventional methods of attracting girls to secondary school, such as providing them with sanitary napkins. However, evaluations by Oster and Thorton (2011) revealed that menstruation accounted for a very small percentage among the reasons for girls not attending secondary school.

Uganda, as mentioned, has implemented a number of programs targeting girls' education. The country managed to attain gender parity in primary education by 1999 through the UPE program (Deininger, 2003). The focus then shifted to secondary education with the introduction of Universal Secondary Education (USE) in 2007. One of the main projects targeting secondary education for girls is the Uganda Post-Primary Education and Training Expansion and Improvement (UPPET) project supported by the African Development Bank. This project intends to increase the share of female secondary school enrolment to 50 percent by 2015 through the expansion of school infrastructure and the introduction of a double shift school system in some parts of Uganda (African Development Bank, 2008). Nonetheless, a recent assessment of the cost-benefit analysis

of the project by Ssewanyana et al. (2012) reveals that not all the intended project goals will be achieved due to insufficient funding from the government's side.

Demand-side financing interventions are not new in Uganda. Indeed, the country has experimented with schemes such as food for education in Northern Uganda and school fee grants for orphans of HIV/AIDS patients. Alderman et al. (2012) show that the provision of take-home rations to primary school children in Northern Uganda increased girls' morning attendance by as much as 30 percentage points. Subsequent evaluation also showed that interventions such as school feeding programs and take-home rations can impact positively on children's cognitive development (Adelman et al., 2009). Other examples of previous demand-side interventions in Uganda include the Community HIV/AIDS Initiatives (CHAI) project—operational during 2002–7—that provided cash transfers to communities affected by HIV/AIDS which could be used to pay school fees for secondary school children (Uganda AIDS Commission, 2007). Overall, both these schemes are geographically restricted and operated as projects for a defined duration.

3. POLICY GOAL AND ALTERNATIVES

The overall goal is to increase access to secondary schooling by enrolling at least 50 percent of girls of secondary school going age (13 to 18 years) who are currently out of school.

The objective of this policy simulation is to examine how girls' access to secondary schooling, especially poor girls, can be increased over the next eight years (2013 to 2020). In particular, we propose two policy alternatives which can complement the existing USE program. These policy alternatives are:

1. Providing stipends to girls to pay for tuition fees in public secondary day-schools (hereafter referred to as Policy I).
2. Providing stipends and transport vouchers to girls to attend public secondary day-schools (hereafter referred to as Policy II).

The eligibility criteria for the two policies are: *(i)* females should be aged 13 to 18 years and must have successfully completed primary education with a Primary Leaving Certificate; *(ii)* residents of households headed by persons considered disadvantaged—children, females or persons with disabilities; and *(iii)* children currently out of school because of financial constraints. Under Policy I, each beneficiary will receive a tuition stipend of UGX 130,000 (US$ 50) per year for day-schools. The policy will be implemented by transferring funds from the government to the schools where the beneficiaries are enrolled. Under Policy II, each beneficiary will receive a sum of UGX 195,000 (US$ 75) per year to cover tuition (US$ 50) and transport (US$ 25). Transport vouchers will help beneficiaries access free transport from government-contracted transporters.

The choice of Policy I is based on the fact that the USE programme does not sponsor all pupils who have completed primary schooling. Not only is the USE program being implemented in limited secondary schools, it is restricted to only those pupils who scored

4, or 28 aggregates in the Primary Leaving Examinations. Therefore, Policy I would target poor girls who qualify to join secondary school but are not covered by the USE program. The choice for Policy II is guided by the reasons cited by parents for not enrolling their girl children to secondary schools. Besides the high tuition fees, one other reason that prevents some parents from enrolling girls in secondary schools is that these schools, unlike primary schools, are further from home and would require them to walk very long distances in relatively unsafe environments (Lloyd, 2009). Consequently, the provision of stipends and free transport is seen as one of the ways of addressing the cost and safety concerns of parents.

4. METHODOLOGY

4.1 Data and sources

The data used in this study was obtained from three sources. First, we used the most recent national household survey—the 2009–10 Uganda National Household Survey (UNHS) conducted by the Uganda Bureau of Statistics (UBoS). This is a survey designed along the lines of the World Bank's living standards measurement surveys whose major objective was to track trends in all aspects of household welfare in Uganda. The 2009–10 UNHS was based on the two-stage stratified random sampling method. In the first stage, the principal sampling unit was the enumeration area (EA) based on the 2002 census as the sampling frame. In the second stage, households were the main sampling units, with 10 households being randomly selected from each EA. Equally important, the sample size is large—at least 34,800 individuals from 6,711 households were covered (Uganda Bureau of Statistics, 2010). This extensive coverage ensured that the data is also representative at the regional level. Using the information obtained, coupled with household status on welfare distribution, we estimate the benefits of public secondary schooling in Uganda in 2009–10. Consequently, the UNHS survey is the primary basis for information on the benefits and equity of public education expenditure in Uganda.

The information on current education spending was acquired from the Background to the Budget by the Ministry of Finance Planning and Economic Development, 2010–11 (BB for short). This publication lists public spending by sector for expenditures incurred in the past fiscal year; the current approved budget; and projected expenditures in the medium term. In addition, it provides a breakdown of expenditures by subsectors. For the education sector, BB gives past, current and future expenditure for district secondary schools. Table 2 provides a snap-shot of current and projected expenditure for the education sector during 2011–-16.

Table 1: Trends in share of education sector in the budget, 2000–1 – 2010–11 and projections for 2011/–12 to 2015–16

						Budget projections[a]				
Sector	2006/7	2007/8	2008/9	2009/2010	2010/2011	2011/2012	2012/13	2013/2014	2014/15	2015/16
Share of the health sector in the national budget (%)	17.5	16.8	15.3	15.3	16.8	14.4	14.8	15.6	15.7	15.3
Total budget (UGX, billions)	4,106	4,486	5,859	7,044	7,376	9,674	11,454	12,644	13,670	15,588
Foreign exchange rate (UGX per US$)[c]	1,780	1,696	1,930	2,029	2,400	-	-	-	-	-
Total budget (US$, billions)	2.31	2.65	3.04	3.47	3.07	4.03	4.77	5.27	5.70	6.50
Proportion of the budget externally financed (%)	25	25	22	24	19	22	25	25	25	23
Taxes as a share of GDP	12.9	12.9	12.2	12.1	12.9					
Fiscal Deficit (as % of GDP)	-5.2	-4.6	-4.2	-4.9	-3.6					

Sources: Background to the Budget (various years) Ministry of Finance Planning and Economic Development (MFPED).

Notes: [a] The budget projections for 2011/12 to 2015/16 are based on the Medium term expenditure framework (MTEF) published in the 2011/12 Background to the Budget (GoU, 2010b)

b Other economic functions include the sectors of: tourism trade and industry; lands, housing and urban development; information and communication technology.

c The foreign exchange rates are based on the official middle rate for a given financial year as published by the Bank of Uganda. For the period 2011/12-2015/16, we assume a fixed exchange rate of UGX 2,400/US$ for the period 2011/12-2015/16

As part of the simulation process, we undertook a number of estimations to generate the current distribution of public education expenditure. First, we estimated the current utilization of public secondary schools by the household's welfare status using the 2009–10 UNHS. This enabled us to establish the benefit incidence of the current secondary education subsidy by gender. Second, based on the annual secondary school expenditure reported in BB and the annual utilization mentioned here, we estimated the unit cost of secondary schooling. The unit cost enabled us to allocate public spending on secondary education across different wealth categories.

Other sources of data used in the simulations included the Gender and Productivity Survey (GPS) of 2008; Uganda Education Statistical Abstracts (UESA); Abstracts produced by the Uganda Bureau of Statistics (UBS); and the Ministerial Policy Statements of the Ministry of Finance, Planning and Economic Development (MFPED).

4.2 Assumptions

In order to conduct the simulations, we made the following assumptions:

1. The inflation rate remains constant over the next eight years. Inflation increases the uncertainty of real returns on investment and it has been associated with a decline in expected profitability of investment (Massimo, 2001).
2. Uganda's exchange rate remains constant at UGX 2,600/US$. Exchange rate stability promotes price stability and checks inflation (De Grauwe and Schnabl, 2008).
3. The population of secondary schools increases by half the growth rate of the annual national population, i.e., 1.6 percent annually.
4. The rate of increase in number of teachers was estimated from the changes in secondary school numbers between 2005 and 2010 as captured by the USEA. Between the two periods, secondary teacher population increased by 65 percent, which is equivalent to an annual growth rate of 13 percent.
5. The completion rate for the two proposed policy options is the same (65 percent), and was generated from the 2000 and 2010 UESA.
6. The annual cost of stipends is UGX 130, 000 per student, as taken from the 2012 education ministerial policy statement.

7. The monthly salary for a lowest paid graduate secondary school teacher is UGX 480,000. The monthly salary of an administrator is equivalent to the salary of a diploma holder (UGX 300,000 per month).
8. The monthly salary of a school inspector is twice that of the lowest paid graduate secondary school teacher at UGX 720,000.
9. Transport cost is half of the stipend, i.e., UGX 65,000.
10. The government does not need to construct new classrooms as is the case with the current USE policy—using public private partnerships.
11. The policy alternatives can deliver 100 percent of the set targets. This assumption is based on the fact that a project that provided stipends to girls to cover the direct costs of schooling was implemented in Bangladesh for eight years, and by the end of the project, the enrolment of females had more than doubled (Bhatnagar and Dewa, 2002). Uganda is similar to Bangladesh in so many ways; they are both low income countries, have low secondary school enrolment—especially among girls—and are implementing the free primary education program. Based on these similarities, we believe the policy alternatives we are proposing would in the same way lead to 100 percent enrolment of the target beneficiaries.

4.3 Data analysis

The analysis involved computing the net present values, benefit to cost ratios, and cost to benefit ratios. These help to determine if the policy proposals will generate net benefits and in an efficient manner. Additionally, a sensitivity analysis was undertaken to highlight the impact of fluctuations in benefits and costs on the overall functioning of the policies.

4.3.1 Estimation of benefits

The direct benefits of each policy were measured in terms of the number of additional girls enrolled in secondary schools. The target was to enrol 50 percent of girls who are currently out of school. We also estimated the indirect benefits in terms of additional lifetime earnings. The incremental earnings were computed by multiplying the cumulative number of girls who will have completed Ordinary Secondary Education (O–level), by the annual wage difference between those with O–level certificates and females with lower academic achievement. Based on a nationally representative survey of women's economic activities—the Gender Productivity Survey of 2008, the Economic Policy Research Centre (EPRC) estimated this annual wage difference at UGX 960,000.

4.3.2 Estimation of costs

Based on some of the stated assumptions, we estimated the costs that would have to be incurred if the two polices were to be implemented. The direct costs include the cost of stipends and transport vouchers. We also noted that the incremental enrolments due to the two policies would create a demand for more secondary school teachers, administrators and inspectors. The wages of additional teaching and non-teaching staff were also estimated based on current salary structures.

4.3.3 Cost-benefit analysis and effectiveness measure

The estimated benefits and costs were projected over an eight-year period for both policy alternatives. They were discounted using a discount rate of 3 percent. Net present

values were obtained by subtracting the discounted costs from the discounted benefits. Additionally, both the benefit-cost ratios and cost-benefit ratios were calculated for each policy alternative.

4.3.4 Sensitivity analysis

One-way and two-way sensitivity analyses were undertaken to ascertain whether the policy alternatives can generate net benefits even if some assumptions were violated. For example, if we assume a completion rate of 65 percent, this can increase or decrease over the years. A positive change in the completion rate would increase the net benefits while a decrease would lower the benefits in terms of lifetime earnings. On the cost side, if the government decides to meet the current demands of teachers for salary enhancement, the wage bill of additional teachers would increase and so would the total cost of each policy alternative. Thus, cognizant of the likely changes in the net benefits and costs, we considered the following scenarios.

A. <u>Best case scenarios</u>

- A 10 percent increase in net benefits, holding total costs constant.
- A 20 percent increase in net benefits, holding total costs constant.
- A 10 percent reduction in total costs, holding the net benefits constant.
- A 20 percent reduction in total costs, holding the net benefits constant.

B. <u>Worst case scenarios</u>

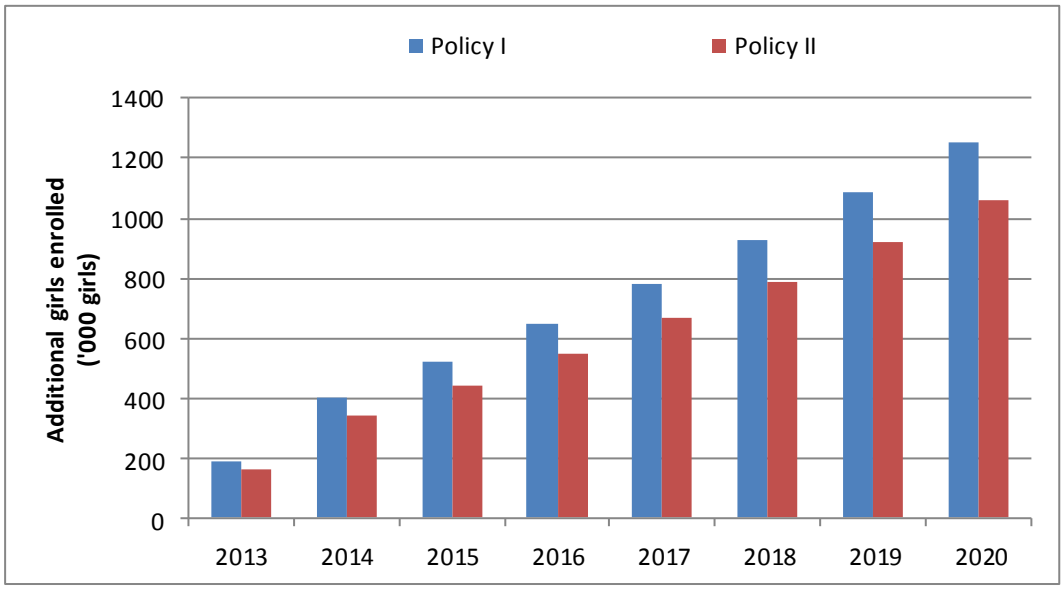
- A 10 percent reduction in net benefits, holding total costs constant.
- A 20 percent reduction in net benefits, holding total costs constant.
- A 10 percent increase in total costs, holding net benefits constant.
- A 20 percent increase in total costs, holding net benefits constant.
- A 10 percent reduction in net benefits, plus a 10 percent increase in total costs.
- A 10 percent reduction in net benefits, plus a 20 percent increase in total costs.
- A 20 percent reduction in net benefits, plus a 10 percent increase in total costs.
- A 20 percent reduction in net benefits, plus a 20 percent increase in total costs.

5. RESULTS

5.1 Projections of costs and benefits

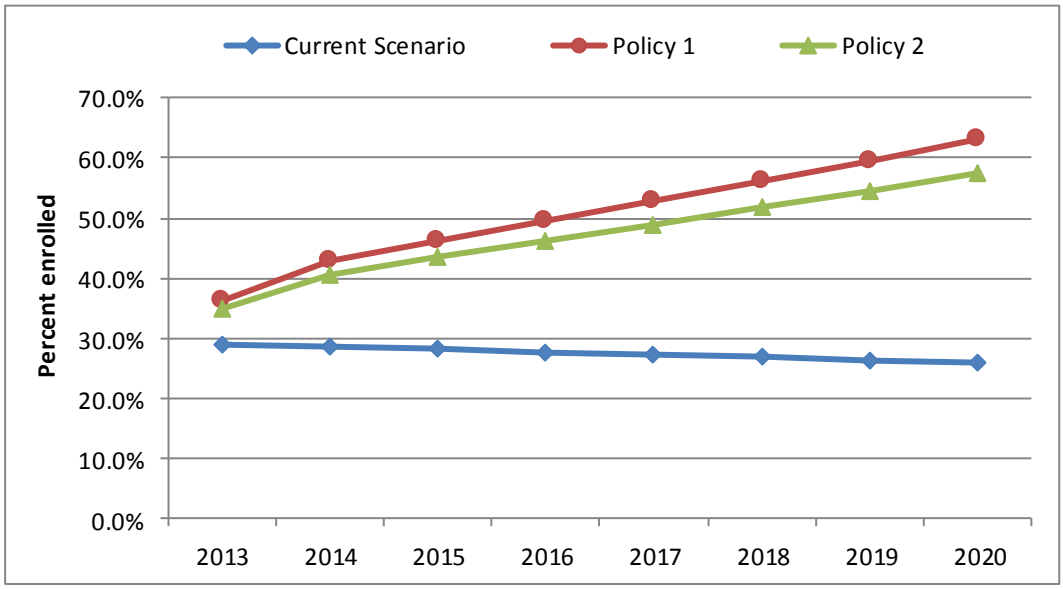
The direct benefit of both Policies I and II is the remarkable increase in the number of girls enrolled in secondary schools (Figures 3 and 4). However, with the exception of the first year of implementation, Policy I leads to higher enrolments than Policy II. By the end of eight years, Policy I leads to the enrolment of 50 percent of girls who are currently out of school (1,249,985 girls). By the end of 2020, Policy II will have led to the enrolment of 42.5 percent of girls who are currently out of secondary school (1,062,487). The difference of 187,498 enrolled girls lies in the varying effectiveness of the two proposed policies. Based on similar studies, we assumed that Policy I is 100 percent effective while Policy option II is 85 percent effective.

Figure 3: Incremental enrolments in policy options I and II



The total percentage of girls enrolled in secondary schooling is far above the projected enrolment without any policy intervention (Figure 5). Policy I increases enrolment by 34 percent to 63 percent, while Policy II increases enrolment by 28.4 percent to 57.5 percent.

Figure 4: New enrolment ratios by policy option



Beyond the direct benefit of increasing enrolment of girls not currently enrolled, both policy options are associated with the indirect benefit of additional earnings. According to the Gender and Productivity Survey of 2008, the annual wage difference between females who have completed their O–level secondary education and those with lower academic qualifications is about UGX 960,000. Going by the current completion rate of 65 percent, we computed the additional earnings that accrue under Policies 1 and II. The findings presented in Table 3 indicate that overall, Policy I leads to more incremental earnings

than Policy II. By 2020, Policy I will have led to UGX 10,796.9 billion in additional earnings for girls who have actually completed O–level. Policy II, on the other hand, will lead to 18.4 percent lower additional earnings (UGX 9,122.7 billion) than Policy I. It is thus evident that Policy I is more likely to generate greater benefits than Policy II.

However, it should be noted that the net present values for both policy options are positive, implying that implementing either policy will generate net benefits to society. Nonetheless, the net present value of Policy I is 23.7 percent more than that of Policy II. Despite the clearly visible higher benefits of Policy I, at this point we cannot conclude that it is *better* than Policy II: the effectiveness of the two polices must be considered first. The effectiveness measure used in this study is the cost per additional girl enrolled. The cost-benefit ratios show that Policy I is the preferred choice because it generates more benefits and at the least cost.

Table 2: Net present values and benefit: Cost ratios of policy options I and II

	Policy I			**Policy II**		
Year	Discounted Total Benefits (UGX billion)	Discounted Total Cost (UGX billion)	NPV (UGX billion)	Discounted Total Benefits (UGX billion)	Discounted Total Cost (UGX billion)	NPV (UGX billion)
2013	120.8	90.8	30.0	102.0	90.9	11.1
2014	360.9	161.2	199.8	304.8	161.8	143.0
2015	657.4	196.0	461.3	555.3	197.3	357.9
2016	1,009.5	230.5	779.0	852.8	232.6	620.2
2017	1,416.5	264.4	1,152.1	1,196.8	267.6	929.2
2018	1,877.9	298.1	1,579.9	1,586.7	302.4	1,284.4
2019	2,393.0	331.3	2,061.6	2,022.0	337.0	1,685.1
2020	2,961.0	364.3	2,596.7	2,502.2	371.5	2,130.8
Total	***10,796.9***	***1,936.6***	***8,860.4***	***9,122.7***	***1,961.0***	***7,161.7***
Cost-benefit ratio		***0.18***			***0.21***	
Benefit-cost ratio		***5.58***			***4.65***	

5.2 Sensitivity analysis

Tables 4 and 5 present findings from the sensitivity analysis. We note that in the best case scenario (20 percent increase in benefits, holding costs constant), the total benefits from Policy I increase by 24.4 percent—from UGX 8,860 billion to 11,020 billion—while the net benefits of Policy II increase by 25.5 percent. In the worst case scenario, we considered a 20 percent reduction in benefits, coupled with a 20 percent increase in costs. The findings revealed that even in the worst scenario, both policy options would still yield net benefits to society, as indicated by the positive net present values. However, the worst case scenario would reduce the net benefits of Policy I by 40.3 percent (to UGX 6,314 billion from 8,860 billion); the benefits of Policy II would reduce by a much higher percentage (44 percent). Thus, we conclude that both policy options remain socially acceptable, despite fluctuations in policy effectiveness, teachers' wages, transport costs, and other costs associated with the implementation of the policies.

Table 3: Sensitivity of the net present value of policy I to changes in anticipated benefits and costs

One-way sensitivity on benefits					
	Base case	10% decrease in benefits	20% decrease in benefits	10% increase in benefits	20% increase in benefits
Discounted benefits (UGX billion)	10,797	9,717	7,774	11,877	12,956
Discounted costs (UGX billion)	1,937	1,937	1,937	1,937	1,937
NPV (UGX billion)	8,860	7,781	5,837	9,940	11,020
Benefit-Cost Ratio	5.58	5.02	4.01	6.13	6.69
One-way sensitivity on costs					
	Base case	10% decrease in costs	20% decrease in costs	10% increase in costs	20% increase in costs
Discounted benefits (UGX billion)	10,797	10,797	10,797	10,797	10,797
Discounted costs (UGX billion)	1,937	1,743	1,549	2,130	2,324
NPV (UGX billion)	8,860	9,054	9,248	8,667	8,473
Benefit-Cost Ratio	5.58	6.19	6.97	5.07	4.65
Two-way sensitivity on benefits and costs					
	Base case	10% decrease in benefits + 10% increase in costs	20% decrease in benefits + 10% increase in costs	10% decrease in benefits + 20% increase in costs	20% decrease in benefits + 20% increase in costs
Discounted benefits (UGX billion)	10,797	9,717	8,638	9,717	8,638
Discounted costs (UGX billion)	1,937	2,130	2,130	2,324	2,324
NPV (UGX billion)	8,860	7,587	6,507	7,393	6,314
Benefit-Cost Ratio	5.58	4.56	4.05	4.18	3.72

Table 4: Sensitivity of the net present value of policy II to changes in anticipated benefits and costs

One-way sensitivity on benefits					
	Base case	10% decrease in benefits	20% decrease in benefits	10% increase in benefits	20% increase in benefits
Discounted benefits (UGX billion)	9,123	8,210	6,568	10,035	10,947
Discounted costs (UGX billion)	1,961	1,961	1,961	1,961	1,961
NPV (UGX billion)	7,162	6,249	4,607	8,074	8,986
Benefit-Cost Ratio	4.65	4.19	3.35	5.12	5.58
One-way sensitivity on costs					
	Base case	10% decrease in costs	20% decrease in costs	10% increase in costs	20% increase in costs
Discounted benefits (UGX billion)	9,123	9,123	9,123	9,123	9,123
Discounted costs (UGX billion)	1,961	1,765	1,569	2,157	2,353
NPV (UGX billion)	7,162	7,358	7,554	6,966	6,769
Benefit-Cost Ratio	4.65	5.17	5.82	4.23	3.88
Two-way sensitivity on benefits and costs					
	Base case	10% decrease in benefits + 10% increase in costs	20% decrease in benefits + 10% increase in costs	10% decrease in benefits + 20% increase in costs	20% decrease in benefits + 20% increase in costs
Discounted benefits (UGX billion)	9,123	8,210	7,298	8,210	7,298
Discounted costs (UGX billion)	1,961	2,157	2,157	2,353	2,353
NPV (UGX billion)	7,162	6,053	5,141	5,857	4,945
Benefit-Cost Ratio	4.65	3.81	3.38	3.49	3.10

5.3 Equity distribution of enrolments and incremental earnings

Figures 5 and 6 show how benefits of public expenditure on Policy I are distributed among rich and poor households. Based on the current distribution of public expenditure on secondary education, girls from the poorest households would least benefit from the policy alternatives. With the current distribution, 20 percent of the poorest girls would receive 12 percent of the benefits; 20 percent of the richest girls would receive 23 percent of the benefits. After reallocations, and keeping the budget fixed, the distribution of benefits tilts in favor of girls from the poorest households. The benefits for the bottom

20 percent of the poorest girls more than double: there is an increase from 12 to 25 percent. On the other hand, the benefits for the top 20 percent richest girls decrease from 23 to 10 percent. Therefore, the policy alternatives will be pro-poor if a deliberate move is made to allocate public funds to secondary schools that are mainly attended by poorer children, that is, day-schools.

Figure 5: Distribution of benefits by quintile

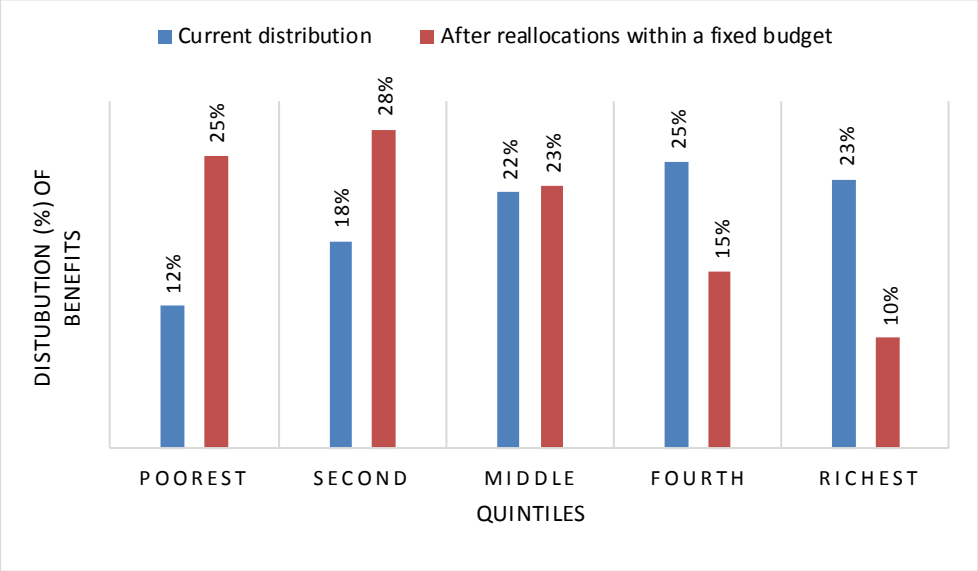
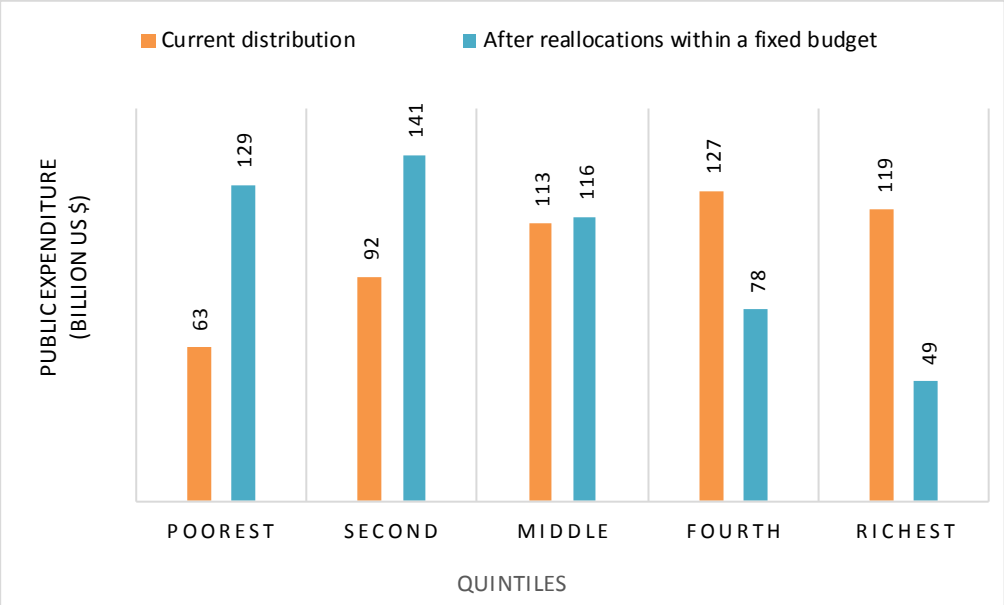


Figure 6: Distribution of total spending on girls' enrolment in public secondary school



We must take note that although the policy proposals are likely to generate great benefits, some issues might arise during implementation which could affect the success of the projects. Such issues include, but are not limited to, failure to select the most deserving beneficiaries; untimely release of funds; poor learning environment at school and home; lack of community support; and irregular or no monitoring and evaluation of the programs. Therefore, successful implementation of the policies would require:

- Commitment from the girls' parents/guardians to pay for schooling costs not covered by the scholarship programs such as meals, uniforms and exercise books.
- School inspectors would have to be employed to monitor and evaluate policy implementation. This is because monitoring and evaluation allows timely identification of problem areas and opportunities to adjust activities to better meet the set targets (American Institute for Research, 2007). The school inspectors are expected to conduct regular school inspections, review progress reports and conduct independent assessments.
- Communities will be facilitated to form committees that will actively participate in reviewing the selection criteria and selecting the most needy beneficiaries. Involving local communities generates community support which is integral for the success of the projects.
- All stakeholders must attempt to create a conducive environment for the chosen girls. For example, they must not be overburdened with household chores which will cut into their time to read. The American Institute for Research (2007) asserts that although financial support encourages parents to send their girls to school, many girls give up before completing the full cycle (in our case O–level) in the absence of a proper supportive learning environment

5.4 Paying for the alternatives

Table 6 presents the budgetary implications of implementing the policy alternatives. If the Government of Uganda is to implement Policy I, the normal education sector budget will have to increase annually by an average of 26 percent, from 1715.4 billion shillings in 2013 to 4691.2 billion shillings in 2020. As a share of GDP, the education sector budget will be between 6.9 percent (in 2013) and 12.6 percent (in 2020) of GDP. In 2011–12, the approved budget allocation for education as a percentage of GDP was 6.2 percent (MFPED, 2012), but this needs to increase to 10 percent to support implementation of Policy I. Moreover, in the recent past, the Ministry of Education and Sports has been able to mobilize additional resources targeting specific interventions. For instance, the UPPET project supported by the African Development Bank has constructed a number of new secondary schools. Consequently, it is possible that external donors could finance additional interventions targeting girls without necessarily affecting the current resources for the secondary school budget.

Table 5: Changes in public expenditure on education sector with the new policy proposals

	2013	2014	2015	2016	2017	2018	2019	2020
Implementing policy I only								
Annual expenditure on policy I (billion UGX)	90.8	166.0	208.0	251.8	297.6	345.5	395.6	448.0
Budget allocation (business as usual)	1,624.6	1,863.4	2,137.3	2,451.5	2,811.9	3,225.3	3,699.4	4,243.2
New budget requirement with policy I only	1,715.4	2,029.4	2,345.3	2,703.3	3,109.5	3,570.8	4,095.0	4,691.2
Needed increment in usual education budget	5.6%	8.9%	9.7%	10.3%	10.6%	10.7%	10.7%	10.6%
Required growth in education budget	22.2%	25.5%	26.3%	26.9%	27.2%	27.3%	27.3%	27.1%
GDP at constant 2002 price (billion UGX)	24,868	26,335	27,889	29,534	31,277	33,122	35,076	37,146
New education budget as a % of GDP	6.9%	7.7%	8.4%	9.2%	9.9%	10.8%	11.7%	12.6%
Implementing policy II only								
Annual expenditure on policy II (billion UGX)	90.9	166.7	209.3	254.1	301.1	350.5	402.4	456.9
New budget requirement with policy II only	1,715.5	2,030.1	2,346.7	2,705.7	3,113.1	3,575.8	4,101.7	4,700.0
Needed increment in usual education budget	5.6%	8.9%	9.8%	10.4%	10.7%	10.9%	10.9%	10.8%
Required growth in education budget	22.2%	25.5%	26.4%	27.0%	27.3%	27.5%	27.5%	27.4%
New education budget as a % of GDP	6.9%	7.7%	8.4%	9.2%	10.0%	10.8%	11.7%	12.7%
Implementing both policies I and II								
Total cost of policy I and II combined	181.8	332.7	417.3	506.0	598.8	696.0	798.0	904.9
New education budget with both policies	1,806.4	2,196.1	2,554.7	2,957.5	3,410.7	3,921.3	4,497.3	5,148.0
Needed increment in usual education budget	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Annual growth in education budget	27.8%	34.4%	36.1%	37.2%	37.9%	38.2%	38.2%	37.9%
New education budget as a % of GDP	7.3%	8.3%	9.2%	10.0%	10.9%	11.8%	12.8%	13.9%

6. CONCLUSION AND RECOMMENDATION

This study was conducted with the objective of evaluating two policy alternatives to increase secondary school enrolment of girls who are currently out of school. The proposed policy options were: *(i)* providing stipends to girls to pay for tuition fees in public secondary day-schools; and *(ii)* providing girls with stipends and transport vouchers to enable them to attend public secondary day-schools. The results showed that both policies would remarkably increase enrolment. The net present values and benefit-cost ratios indicate that both policies are worth investing in. However, the cost-benefit ratios show that Policy I is more effective. Results from the sensitivity analysis revealed that the net benefits of both Policy I and II remain socially acceptable, even in the event that the benefits significantly reduce and the costs remarkably increase. Thus, Policy I is the preferred alternative if 50 percent of girls currently out of school are to be efficiently enrolled in secondary school. Nonetheless, we recommend that funds permitting, both policies should be implemented. Stipends (Policy I) should be given to girls living reasonably close to the day-schools, while Policy II (stipends and transport) should be given to girls living far away.

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8. APPENDICES

Appendix 1: Additional enrolment of girls in secondary schools and the associated costs of implementing policy I

Projections for 8 years	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Population of secondary school going age (13 to 18 years)	2,709,930	2,796,648	2,886,141	2,978,497	3,073,809	3,172,171	3,273,681	3,378,438
Population of girls aged 13 –18 years enrolled in secondary schools	786,086	798,663	811,442	824,425	837,616	851,018	864,634	878,468
Gross secondary school enrolment of girls	29.0%	28.6%	28.1%	27.7%	27.3%	26.8%	26.4%	26.0%
Population of girls aged 13 –18 years not enrolled in secondary school	1,923,844	1,997,985	2,074,699	2,154,072	2,236,193	2,321,153	2,409,047	2,499,970
Policy I objective (enrol 50% of females not in school in the next 8 years	10.0%	20.0%	25.0%	30.0%	35.0%	40.0%	45.0%	50.0%
Annual enrolment based on policy I	192,384	399,597	518,675	646,222	782,668	928,461	1,084,071	1,249,985
New total secondary school enrolment of girls with policy I implemented	978,470	1,198,260	1,330,117	1,470,647	1,620,284	1,779,479	1,948,705	2,128,453
New gross secondary school enrolment of girls	36.1%	42.8%	46.1%	49.4%	52.7%	56.1%	59.5%	63.0%
Requirements for implementation of policy I								
Number of teachers	99,976	112,973	127,659	144,255	163,008	184,200	208,145	235,204
Pupil-teacher ratio	25	25	26	27	28	28	29	30
Number of new teachers needed	4,810	9,990	12,967	16,156	19,567	23,212	27,102	31,250
Number of new administrators (one administrator per school)	5,254	5,937	6,709	7,581	8,567	9,680	10,939	12,361
Number of new school inspectors (two per district)	224	224	224	224	224	224	224	224
Number of anticipated beneficiaries of stipend	192,384	399,597	518,675	646,222	782,668	928,461	1,084,071	1,249,985
Recurrent costs (UGX billion)								
Teachers' wages (newly employed) (graduate@ UGX 5,760,000 per teacher/annum)	44.95	90.74	114.46	138.58	163.11	188.04	213.37	239.10
Administrative staff costs (minimum of diploma holder @ UGX 3,600,000 per annum)	18.91	21.37	24.15	27.29	30.84	34.85	39.38	44.50
School inspectors' wages (minimum of BSc education holder @ UGX 720,000 per month)	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94
Stipend (annual tuition capitation grants @UGX130,000 per girl enrolled)	25.01	51.95	67.43	84.01	101.75	120.70	140.93	239.10
Annual Total Cost Post Complementary Policy	***90.81***	***165.99***	***207.97***	***251.82***	***297.64***	***345.53***	***395.62***	***524.63***
Unit Cost of Policy I (UGX)	***472,032***	***415,401***	***400,967***	***389,679***	***380,284***	***372,153***	***364,937***	***358,427***

Appendix 2: Additional enrolment of girls in secondary schools and the associated costs of implementing policy II

Projections for 8 years	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Population of secondary school going age (13 –18 years)	2,709,930	2,796,648	2,886,141	2,978,497	3,073,809	3,172,171	3,273,681	3,378,438
Population of girls aged 13 –18 years enrolled in secondary schools	786,086	798,663	811,442	824,425	837,616	851,018	864,634	878,468
Gross secondary school enrolment of girls	29.01%	28.56%	28.12%	27.68%	27.25%	26.83%	26.41%	61.13%
Population of girls aged 13 –18 years not enrolled in secondary school	1,923,844	1,997,985	2,074,699	2,154,072	2,236,193	2,321,153	2,409,047	2,499,970
Policy objective (enrol 50 % of the girls not in school in the next 8 years)	10.00%	20.00%	25.00%	30.00%	35.00%	40.00%	45.00%	50.00%
Possible enrolment assuming policy option II is 85% effective	8.50%	17.00%	21.25%	25.50%	29.75%	34.00%	38.25%	42.50%
Additional enrolment based on policy II	163,527	339,657	440,873	549,288	665,268	789,192	921,460	1,062,487
New total secondary school enrolment of girls with policy II implemented	949,613	1,138,321	1,252,315	1,373,713	1,502,883	1,640,210	1,786,094	1,940,955
New gross secondary school enrolment of girls	35.04%	40.70%	43.39%	46.12%	48.89%	51.71%	54.56%	57.45%
Requirements for implementation of policy II (stipends & transport)								
Number of teachers	99,976	848,668	888,555	930,317	974,042	1,019,822	1,067,754	1,117,938
Student-teacher ratio	25	25	26	27	28	28	29	30
Number of new teachers needed	6,633	13,390	16,890	20,451	24,071	27,750	31,487	35,283
Number of new administrators (one administrator per school)	5,254	5,937	6,709	7,581	8,567	9,680	10,939	12,361
Number of new school inspectors (two per district)	224	224	224	224	224	224	224	224
Number of anticipated beneficiaries of stipends and free transport	163,527	339,657	440,873	549,288	665,268	789,192	921,460	1,062,487
Recurrent costs (UGX billion)								
Teachers' wages (newly employed) (graduate@ UGX 5,760,000 per teacher/annum)	38.21	77.13	97.29	117.80	138.65	159.84	181.37	203.23
Administrative staff costs (minimum of diploma holder @ UGX 3,600,000 per annum)	18.91	21.37	24.15	27.29	30.84	34.85	39.38	44.50
School inspectors' wages (minimum of BSc education holder @ UGX 720,000 per month)	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94
Free transport fare (voucher @UGX 65,000 per girl per year)	10.63	22.08	28.66	35.70	43.24	51.30	59.89	69.06
Annual tuition fee @ UGX 130,000 per girl per year	21.26	44.16	57.31	71.41	86.48	102.59	119.79	138.12
Annual Total Cost, Post Complementary Policy	***90.95***	***166.67***	***209.35***	***254.13***	***301.15***	***350.52***	***402.37***	***456.85***
Unit Cost of Policy Option II (UGX)	***556,158***	***490,695***	***474,843***	***462,661***	***452,674***	***444,144***	***436,662***	***429,982***

Appendix 3: Distribution of benefits policies I and II based on current distribution of benefits and reallocations with fixed budgets

Current unit cost of public secondary schooling	241,125					
Projections based on current distribution of benefits						
Number of girls enrolled	**Poorest**	**Second**	**Middle**	**Fourth**	**Richest**	**Total**
Policy I (tuition only)	260,523	380,142	469,111	525,515	493,163	2,128,453
Policy II (tuition and transport)	237,573	346,655	427,787	479,222	449,719	1,940,955
Public expenditure (billion UGX)	**Poorest**	**Second**	**Middle**	**Fourth**	**Richest**	**Total**
Policy I (tuition only)	63	92	113	127	119	513
Policy II (tuition and transport)	57	84	103	116	108	468
Current distribution of benefits	**Poorest**	**Second**	**Middle**	**Fourth**	**Richest**	**Total**
Policy I (tuition only)	12%	18%	22%	25%	23%	100%
Policy II (tuition and transport)	12%	18%	22%	25%	23%	100%
Reallocations within fixed budgets	**Poorest**	**Second**	**Middle**	**Fourth**	**Richest**	**Total**
Subsidy (%)	100%	75%	50%	30%	20%	
Weight of quintiles	**Poorest**	**Second**	**Middle**	**Fourth**	**Richest**	**Total**
Policy I (tuition only)	260,523	285,106	234,556	157,655	98,633	1,036,472
Policy II (tuition and transport)	237,573	259,991	213,893	143,767	89,944	945,168
Unit subsidy (UGX) for either policies	**495,164**					
Total cost (billion UGX)	**Poorest**	**Second**	**Middle**	**Fourth**	**Richest**	**Total**
Policy I (tuition only)	129	141	116	78	49	513
Policy II (tuition and transport)	118	129	106	71	45	468
New distribution of benefits	**Poorest**	**Second**	**Middle**	**Fourth**	**Richest**	**Total**
Policy I (tuition only)	25%	28%	23%	15%	10%	100%
Policy II (tuition and transport)	25%	28%	23%	15%	10%	100%