Reducing the constraints to school access and progress: assessing the effects of a scholarship program in rural Malawi

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Abstract

Purpose – The study aims to provide insight on the potential effectiveness of demand-side financing for catalyzing improved educational outcomes in Malawi; and, given the extent of cost-related constraints to school contexts in other low-income countries, the results have relevance for education policy decisions more broadly.

Design/methodology/approach – This study utilizes a non-equivalent groups research design to compare the educational experiences and outcomes of two student groups – those who did and those who did not receive a needs-based scholarship to attend secondary school and college in the Dowa, Kasungu, and Lilongwe Districts of Malawi. The authors assess impacts across a range of short and medium-term outcomes, including: school attendance, withdrawal, attainment, graduation, employment status, employment quality, and post-schooling income.

Findings – The scholarship substantially reduces the household cost of participation in school, and reduces the distance travelled to school. As a result, scholarship recipients attain between 1 and 1.5 years of additional schooling and graduate at higher rates. In terms of post-schooling outcomes, recipients are in higher wage-earning occupations after leaving school. Overall, results suggest that scholarships are an effective demand-side strategy for improving educational attainment, progression, and potentially longer-term labor market outcomes.

Originality/value – The study adds new evidence on policy approaches for expanding access to educational opportunities and increasing labor market outcomes in a context (Malawi specifically and sub-Saharan Africa more broadly) where evidence on such demand-side interventions is still growing.

Keywords Scholarships, Demand-side financing, Secondary school, Higher education, Malawi

Paper type Research paper

Introduction

While 42 of 53 countries in Africa legally guarantee free primary education (Global Education Monitoring Report, 2016), there are still many barriers limiting student progress both within and beyond primary school. Over the past 2 decades, access to secondary education in Africa has increased, albeit at a slower pace than primary school expansion [1]. However, the total share of students enrolled in post-primary education remains low across the continent.

One of the largest barriers to secondary education across countries is the cost of participation—including direct, indirect, and opportunity costs [2]. This is especially true in Malawi. Of 187 countries globally, Malawi ranks 174th in the number of years that children spend in school (UNDP, 2013). This is partially due to the inability of millions to pay for school. In Malawi, the government covers the cost of schooling up to 8th grade; but in order for students to continue to the secondary grades (9-12th), they have to pay high tuition rates and meet a rigorous performance expectation. In a country where GDP per capita is only $300 per year (World Bank, 2016), it can cost between $40 and $700 per year for a student to attend secondary school, an amount much higher than many families can afford—even for a single child (Banda, 2016). In addition to these direct school fees, households face indirect costs of school attendance (including school uniforms, supplies, and transportation), and high

opportunity costs to send their children to both secondary school and college (Kadzamira and Rose, 2003; Pridmore and Jere, 2011; World Bank, 2010b).

One successful approach for overcoming the deterrent costs of attendance across Africa and elsewhere has been through demand-side financing. In contrast to the traditional supply-side approach to funding the educational experience – through government finance of public schools, their inputs, infrastructure, and operation – demand-side finance directs funds to consumers for alleviating the costs of school attendance. This study examines the effectiveness of one such demand-side financing program in rural Malawi—the Educate the Children secondary and tertiary scholarship program—on alleviating barriers to post-primary school attendance and completion. We also investigate the effects of scholarship reception on graduation and employment. In this vein, we address the following research questions:

(1) What are the primary constraints that keep students from attending school at the secondary and tertiary levels?

(2) What is the relationship between the household cost of schooling and a student's ability to successfully progress through the education system?

(3) Do scholarship recipients graduate at higher rates than non-recipients?

(4) Do scholarship recipients have higher rates of employment after graduation than non-recipients?

(5) Are scholarship recipients employed in higher-quality (i.e. higher-skill) jobs after graduation than non-recipients?

Findings provide insight on the potential effectiveness of demand-side financing for catalyzing improved educational outcomes in Malawi; and, given the extent of cost-related constraints to school contexts in other low-income countries, the results have relevance for education policy decisions more broadly.

Demand-side financing

Prior efforts to expand education in Africa have found that, given the influence of economic, political, cultural, and social factors on household schooling decisions, the mere existence of a school is, on its own, insufficient to induce participation for certain student populations (Patrinos, 2007). In response to this reality, demand-side financing has been used in various forms to overcome certain cost-related barriers to educational persistence. Demand-side interventions are meant to alleviate the financial and opportunity costs of school attendance. Some of the more common financing strategies in education include: school vouchers, stipends, scholarships, cash transfers (both conditional and unconditional), loans, and in-kind transfers (for goods such as food and uniforms). Existing research suggests that these programs can have positive impacts on student attendance (and sometimes achievement). Moreover, considering the slowed progress towards universal primary education following at least 2 decades of supply-side expansion (UNESCO, 2015), demand-side strategies may be a necessary policy strategy to reach universal enrollment, and for narrowing educational attainment gaps between the poor and wealthy in particular.

By far, the most research has been conducted on demand-side financing in the form of conditional and unconditional cash transfers, and their potential impact on student attendance, attainment, and learning outcomes in low- and middle-income countries (LMICs). Cash transfers provide positive income shocks to households, with the intent of overcoming cost-related restrictions to educational participation. In the case of conditional cash transfers (CCTs), money flows to households, contingent upon the fulfillment of certain conditions such as consistent school attendance. Unconditional cash transfers (UCTs) are similar, but are not

dependent upon any stipulated behavioral conditions. Recent systematic reviews and meta-analyses of CCTs have found that these demand-side interventions tend to produce significant gains in school enrollment, attendance, and retention (Fiszbein and Schady, 2009; Baird *et al.*, 2013; Bastagli *et al.*, 2016; García and Saavedra, 2017). However, the impact of CCTs on student learning is less consistent—typically small or not statistically significant (Baird *et al.*, 2013; Bastagli *et al.*, 2016).

In 2006, Malawi instituted its own cash transfer initiative, the Social Cash Transfer Program (SCTP), which targeted unconditional transfers to "ultra-poor, labor constrained households" in Malawi's Mchinji District (Kilburn *et al.*, 2017). The program has been effective at increasing household demand for education, with treatment children (between ages 6 and 17) being 12 percentage points more likely to be enrolled in school and 4 percentage points less likely to drop out. For students not enrolled at baseline, the UCT had a 20 percentage-point impact on enrollment (Kilburn *et al.*, 2017). Baird *et al.* (2011) conducted research on an additional cash transfer program, targeted at adolescent girls in Malawi. They found that while both CCTs and UCTs had declines in dropout rates, CCTs had much larger impacts during the two-year program. CCTs also outperformed UCTs in English reading comprehension, but teenage pregnancy and marriage rates were substantially lower in the UCTs than the CCTs. In summary, conditional and unconditional cash transfers have proven to be one demand-side approach capable of boosting poorer students' persistence in school across LMICs and within Malawi specifically.

One additional approach to demand-side education finance is through the provision of scholarships. Scholarships typically follow one of two forms: (1) means-tested payments to students who face higher relative barriers to education participation (e.g. girls, poor students, rural communities), and (2) merit-based payments to students who perform above a certain performance threshold. Often, the former are pursued for the purposes of boosting school attendance and progression, while the latter are meant to incentivize higher student achievement in school. By covering all or part of the direct cost of tuition, housing, and other expenses, scholarships remove at least part of the financial burden that discourages cash-constrained households from sending their children to school (and keeping them in school).

Glewwe and Muralidharan (2015) review the existing experimental research on merit-based scholarship programs in LMICs, including programs in Kenya, Benin, and China. Their findings suggest that both means-tested and merit-based scholarships produce significant gains in enrollment, attendance, and transition rates between schooling levels, with impacts ranging between 3 and 10 percentage points. Additionally, merit-based scholarships are effective in facilitating growth in student achievement, with impacts of up to 0.28 standard deviations (Blimpo, 2014; Friedman *et al.*, 2011; Kremer *et al.*, 2009; Li *et al.*, 2014).

In a qualitative evaluation of a girls' scholarship program in Malawi's rural Zomba district, Sineta (2012) finds a reduced drop-out rate from the national average of 11% to nearly zero (0.8%). The scholarship helped overcome both financial (direct costs and opportunity costs, such as female help in the home) and social constraints (early pregnancy and marriage, as well as lower household priority on girls' education) to educational persistence.

Overall, various demand-side finance approaches (cash transfers, vouchers, and scholarships) have all been found to be effective mechanisms for increasing demand for and participation in education for less-privileged social groups. The remainder of the paper assesses the impact of a specific scholarship program in rural Malawi and considers lessons for future education decision making in the country as well as in other LMICs.

Malawi education context

Malawi introduced free primary education (FPE) in 1994, eliminating all fees in public schools such as tuition, uniforms, and textbooks (Inoue and Oketch, 2008). While the policy was

successful in boosting primary school participation [3] (school life expectancy increased from 7.2 years of schooling in 1994 to 10.4 in 1995) the initial shock imposed great strain on the capacity of the education sector; the pupil-teacher ratio shot up to 80:1, giving Malawi one of the highest ratios in Africa, and double that of its regional neighbors in the Southern African Development Community (SADC) (World Bank, 2010b). Today, nearly two-and-a-half decades later, the country has yet to recover from near-universal primary enrollment, with the 2015 pupil-teacher ratio at 70:1 (World Bank, 2020). In contrast, secondary school ratios in Malawi are low, at 20:1, below even that of the SADC and Sub-Saharan Africa (SSA) averages (22:1 and 28:1). This is due primarily to the low number of students progressing to the secondary school level [4].

The acceptance rate into Malawi's secondary grades is one of the lowest in Africa (16.3%), particularly for girls – only 67 girls are admitted for every 100 boys (World Bank, 2010a). Moreover, there are significant gaps in both primary and secondary school access by rural/urban status (World Inequality Database on Education, 2018). While 86% of Malawian children start primary school, only 28% start secondary school, and a mere 11% finish (UNICEF, 2013). The situation is most acute for poor families, whose children complete lower secondary school at a dismal 7% compared to 50% of those from rich families (UNESCO, 2018). For many households, the direct and indirect costs associated with school attendance at the primary, but particularly the post-primary, levels are prohibitive (Kilburn *et al.*, 2017; Pridmore and Jere, 2011; World Bank, 2010b). With over 80% of the population agrarian, and over 50% living on less than the international poverty line of $1.90 a day, the cost of schooling is too high for the vast majority of the country (Food and Agriculture Organization, 2015). The per-pupil expenditure for a secondary student in Malawi is 33% of GDP per capita, which is twice that of the low-income country median of 16% (Education Policy and Data Center, 2014). Yet, these resources are not going to the neediest students. In total, 72% of the national education resources go to the top 10% of students (Education Policy and Data Center, 2014).

The scholarship program

Educate the Children (ETC) is a program administered by the Force for Good Foundation in Malawi. ETC provides roughly 40 scholarships per year to support attendance in secondary school and college for students with limited resources. Recipients are selected from a pool of around 200 applicants. The application asks students basic demographic questions about their home village, age, family, etc. Applicants also provide information about the school they are applying for, the expected costs of tuition, boarding, tests, books, and lab fees, and their response on how they will use the scholarship to build up the nation of Malawi. Requirements for continued reception of the scholarship include attending class, passing exams, and good behavior. At the college level, the scholarship prioritizes funding for students pursuing a few specific professional tracks, such as accounting, engineering, electricity, mechanics, computer science, nursing, teaching or medicine.

The application process requires submission of an application form either in-person, at the office in Lumbadzi, or via email. This creates some limitations regarding the type of students capable of applying for the scholarship – that is, those in close proximity to Lumbadzi, those with access to transportation, or those with internet/email access. As a result, applicants come mostly from the districts of Dowa, Lilongwe, Ntchisi, and Kasungu. Additionally, applications with stronger academic skills (those who can write more persuasively about their contributions to Malawi and the community—a requirement on the application) may have an advantage during the application process. The selection of candidates involves two stages – first, an initial screening of applicants to determine that each meets the requirements for financial need, and second, selection of the recipients by the ETC board, in principle, based on those with the greatest need for the scholarship. The scholarship covers the full cost of

tuition and board at the school of the student's choosing. The amount of the scholarship is not sufficient to cover indirect costs, such as: transportation, books and other supplies, uniforms, meals, etc. As such, students pay for these types of indirect costs out of pocket.

Data and research design

The study applies a non-equivalent groups research design to assess the educational experiences and outcomes of two student groups – those who applied for and received a needs-based scholarship (referred to as "recipients"), and those who applied for but did not receive a scholarship ("non-recipients") to attend secondary school or college.

Sampling

The population of interest for this study includes all students who have previously applied for an ETC scholarship. As the majority of our research questions seek to understand the impacts of the scholarship on short-term and medium-term student outcomes, we conducted a multi-stage stratified sampling procedure, to include those who were and those who were not selected to receive a scholarship. Each of these groups, was split to include those who had applied for scholarships at the secondary versus tertiary levels. Lastly, we selected participants who were both currently in school, as well as those who are no longer in school—due either to completion or drop-out. The result of this procedure was a final sample, split into eight strata by scholarship reception, schooling level, and enrollment status. Sample sizes for each group average 18.2, with a total study sample size of $n = 146$. Simple random sampling was used to select participants within six of these eight strata. However, we experienced some difficulty locating former non-recipients at both the secondary and college levels. As such, some of those interviewed in each group were selected through a process of convenience sampling; this represents one potential limitation of the generalizability of the study's findings. We perform balance diagnostics to determine the extent to which such non-random sampling may skew the evaluation's representativeness for former non-recipient students.

Data

We administered surveys to 89 scholarship recipients and 57 non-recipients in the Dowa, Kasungu and Lilongwe Districts of Malawi. Surveys included items to determine group differences across a range of short and medium-term outcomes, including: career aspirations, attendance rate, withdrawal rate, graduation rate, employment status, time unemployed since graduation, and employment quality (measured using the Tanzanian Standard Classification of Occupations, or TASCO). The TASCO index classifies types of employment into nine professional categories. These categories are meant to be treated as ordinal measures, essentially rankings jobs by their relative levels of required technical skills. For example, a clerk or secretary would be ranked higher than a farmer but lower than an associate professional or technician. Values range from one for the most technical profession to nine for the least technical professions (see Table 1).

In addition to questions on direct and indirect school costs, the study addresses some of the non-financial constraints that students face in accessing formal education services. These include gender, distance to school, means of transportation, and access to a boarding school. Lastly, we explore the associations between student education and economic outcomes.

We split our findings into those relevant to current and former students. Such an approach requires measurement of different outcome measures, as short-term and medium-term outcomes are applicable for current and former students, respectively. For current students, we measured the effects of scholarship reception on attendance, absences, withdrawals, borrowing rates, and use of boarding schools. For former students we measured the effects of

	N	Min	Max	Mean	Std. Dev.
Scholarship recipient	146	0	1	0.61	0.489
Secondary student	146	0	1	0.47	0.500
Former student	146	0	1	0.60	0.491
Female	146	0	1	0.25	0.432
Urbanicity	146	2	4	2.23	0.495
Father years of schooling	142	1	15	9.29	4.01
Mother years of schooling	143	1	15	7.62	3.38
Wealth index	146	−0.87	2.11	0.00	1.00
Household income	141	$20.5	$7,260.3	$535.2	$826.4
Borrowed money for school	57	0	1	0.82	0.384
Out-of-pocket school costs	56	0	$1,013.7	$214.4	$270.5
Distance from school	56	2	120	19.54	22.983
Year finished school	87	2009	2017		
Number of absences	57	0	240	10.72	43.02
Withdrew from school	57	0	1	0.19	0.398
Graduated	88	0	1	0.73	0.447
Student in boarding school	57	0	1	0.51	0.504
Occupation quality	65	1	9	5.72	2.90
Yearly wage	63	0	$4,931	$685	$902.4

Table 1. Descriptive statistics for variables of interest

scholarship reception on educational attainment, graduation rates, employment rates, employment quality, and income.

We conduct independent samples *t*-tests and ordinary least squares (OLS) regression, holding constant certain student and household factors (income, school cost, boarding school status, wealth index, education level, graduation year etc.) to test for differences in outcomes between recipients and non-recipients (i.e. reflective of performance difference between all scholarship recipients and non-recipients).

Before estimating the effects of the ETC scholarship program, we first check for systematic demographic differences between scholarship recipients and non-recipients, which might impose bias upon the results. Results suggest that there are some differences between recipients and non-recipients. Most notably, comparing the average family income of these students, we find higher incomes for recipients than non-recipients at both the secondary and college levels. We observe a 21% difference ($47) for secondary students and a 41% difference ($281) for college students. Both of these differences are significant at $p < 0.05$. There is a possibility that the scholarship application process favors wealthier applicants. For example, given that the application requires a written one-page essay on the students' plans for using their education to contribute to building up Malawi and their local communities, students with stronger academic skills, or better-resourced families, may have the ability to more persuasively make their case for scholarship selection.

If the ETC program is indeed favoring better-resourced students, this would impose bias on the results in favor of scholarship recipients. However, we approach interpretation of this finding cautiously, given that the indicator of family income is measured after (or during) student participation in the scholarship program, and does not isolate the income contributions of the recipients and non-recipients themselves to family income. As such, if students are reporting their own income contributions to the overall family income, this measure may partially capture the impact of scholarship reception on family income itself. In this regard, we expect the family incomes of (current and former) secondary students to be less influenced by this potential bias, as students have had less time in the labor market, as compared to (current and former) college students.

In addition to self-reported family income, we collected data on a set of 18 different household assets for the purpose of constructing an index of household wealth. This index offers a more holistic measure of household economic well-being, which is important, as income is not the most consistent measure of economic stability in Malawi, given the high rate of subsistence farming and other agriculturally-based sources of income. Items include smaller assets, such as a table, bed, bicycle, phone, and a borehole, as well as larger items like a motorcycle, car, electricity, or smartphone. Respondents also reported on the construction materials of the flooring, walls, and roofing in their homes. From this full set of items, we identified five household assets that loaded strongly onto a single construct (what we refer to as "household wealth") through exploratory factor analysis: flooring material (factor loading = 0.951), roofing material (0.877), piped water (0.431), table (0.612), and bed (0.699). Results from a reliability analysis suggest that these five items demonstrate a high degree of internal consistency ($\alpha = 0.771$).

This household wealth index is significantly correlated with the household income variable ($\rho = 0.478$, $p < 0.001$). However, we find no statistically significant difference on the wealth index between recipients and non-recipients. Moreover, scholarship recipients and non-recipients are statistically equivalent with respect to the other measured household background characteristics (i.e. father and mother years of schooling, female, and community urbanicity) (Table 2). Thus, given the similarity of recipient and non-recipient characteristics on all variables, with the exception of family income, and the uncertainly regarding the temporal order between this variable and scholarship reception, we feel reasonably confident that treatment and comparison groups are sufficiently balanced to justify estimating the effects of the ETC scholarship on student outcomes. We do not discount the possibility that results presented here may overestimate the true impact of the program; if the scholarship recipients indeed come from more affluent families, they may differ in other unobserved ways that could affect the outcomes. However, we feel that, even in this case, given the size of the evidence in favor of the scholarship's positive impact, some of the results would potentially remain after fully accounting for differences in characteristics between treatment and comparison students.

Results

School costs

In seeking to understand the ability of a scholarship program to reduce the household costs of education participation, we first assess the extent to which the ETC program impacts household education expenditures. We find that reception of the scholarship does indeed reduce the out-of-pocket costs for school attendance—specifically, for the direct costs of schooling (i.e. tuition and board); however, it does not eliminate all household spending on education. Scholarship recipients are still directing household resources to pay for indirect

Table 2. Independent-samples *t*-tests, recipient vs non-recipient demographics

	df	Mean diff. (Std. err.)	*t*	Sig	95% lower bound	95% upper bound
Father years of school	140	−0.250 (0.688)	−0.364	0.717	−1.61	1.11
Mother years of school	141	0.043 (0.582)	0.074	0.941	−1.10	1.19
Female	144	−0.084 (0.073)	−1.15	0.249	−0.229	0.060
Urban	144	0.112 (0.084)	1.334	0.184	−0.054	0.277
Wealth index	144	0.068 (0.170)	0.401	0.689	−0.268	0.404

school costs. This includes but is not limited to school uniforms, supplies, stationaries, transportation, meals, and (for college students) lab equipment, computers, etc. To cover these expenses, households are paying out of pocket as well as borrowing from neighbors and family members. Those who did not receive the scholarship were, on average, paying 26% more out of pocket for secondary school ($41 vs $11) and 36% more for college ($591 vs $281).

School absence, withdrawal, attainment, and graduation

In attempt to understand the potential impact of the scholarship on student participation in school, we assess the relationship between reception of the scholarship and three separate outcome measures: absence, withdrawal, and attainment. We first investigate the relationship between scholarship reception and student absence from school.

For secondary students, scholarship reception is associated with a reduction in the number of absences in the previous month. This is statistically significant in a simple linear regression, with recipients experiencing 2.8 fewer absences (Table 3, model 1). After controlling for a set of student demographic and financial indicators, scholarship recipients had 4.1 fewer absences in the previous month. This model accounts for two-thirds of the variation in student absences ($R^2 = 0.67$). Adding student distance from school to the model adds an additional 10 percentage points in explained variation to the model. Indeed, student distance from school is an important predictor of a student's absence rate at the secondary level. Additionally, there are fewer absences for students in more expensive schools, students with more highly-educated mothers, and students from wealthier families. However, after adding distance from school, the scholarship effect is reduced to 2.1 absences (i.e. recipients were absent 2.1 fewer days in the previous month), and becomes statistically non-significant.

Model 3 suggests that the distance from school is a significant predictor of student absence, with a sharp increase in absences the farther a student has to travel to school. Importantly, reception of a scholarship is strongly associated with shorter travel distance to school (5.4 min for recipients versus 32.8 min for non-recipients). Non-recipients travel four times farther to school than recipients. Much of this is explained by the fact that most non-recipients travel to school from their home villages. In contrast, scholarship recipients are attending boarding schools at significantly higher rates (78.6 vs 28.6%), and thus living during the week on the school campus, which substantially reduces the time for travel to school, and likewise the rate of absence.

We observe no difference in the rate of absences between recipients and non-recipients at the tertiary level (Table 3). This is explained by the fact that reception of a scholarship at the tertiary level is not associated with higher boarding school attendance; and as such, there is no significant difference in the distance travelled to school by tertiary recipients (23.8 min) and non-recipients (13.8 min; $p = 0.105$).

The second indicator of the educational impact of the scholarship is the rate of withdrawal from school. Common reasons for withdrawal include funerals, teacher strikes, help needed at home during harvest; but, much of the time it is due to inadequate funds to pay school fees and expenses. The odds ratio from the naïve regression model (model 1 in Table 4) shows that non-recipients are 4.5 times more likely to withdraw from school than recipients. On its own, scholarship reception accounts for 8% of the variation in the withdrawal rate. After controlling for distance to school and amount borrowed for schooling expenses, non-recipients are still 3.7 times more likely to withdraw from school (Table 4, model 2). However, when additionally controlling for parent education levels and the household wealth index, non-recipients are 2.9 times more likely to withdraw, and the effect becomes non-significant at the 0.10 alpha level (Table 4, model 3).

We find that scholarship reception is also related to a substantial increase in years of schooling completed. Before accounting for any differences in demographic characteristics,

Table 3. OLS regression results, days absent in previous month

	(1) Absences in past month		(2) Absences in past month		(3) Absences in past month	
	Secondary	College	Secondary	College	Secondary	College
Recipient	−2.81*** (1.00)	0.015 (0.62)	−4.15*** (1.04)	0.497 (1.18)	−2.07 (1.23)	1.702 (1.51)
Income[a]			0.069 (0.00)	0.066 (0.00)	0.166 (0.00)	−0.061 (0.00)
Borrow[a]			0.084 (1.26)	0.123 (1.15)	0.111 (1.10)	0.033 (1.37)
Cost[a]			−0.728*** (0.00)	0.225 (0.00)	−0.453** (0.00)	0.574 (0.00)
Father years of school			−0.047 (0.12)	0.034 (0.22)	-0.106 (0.10)	0.051 (0.22)
Mother years of school			−0.387** (0.16)	−0.106 (0.22)	−0.362** (0.14)	−0.258 (0.256)
Wealth index			2.80** (1.16)	−0.497 (0.52)	2.19* (1.04)	−0.217 (0.61)
Distance from school					0.042** (0.017)	−0.002 (0.05)
Constant	3.45*** (0.749)	0.818 (0.49)	9.88*** (2.19)	0.376 (2.37)	6.82*** (2.27)	0.301 (2.72)
Observations	24	28	23	23	23	22
R^2	0.25	0.00	0.67	0.13	0.77	0.24

[a]**Note(s):** Standardized coefficients are reported for income, borrow, and cost
Standard errors in parentheses; ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

	(1) Withdrawal		(2) Withdrawal		(3) Withdrawal	
	Wald	Odds ratio	Wald	Odds ratio	Wald	Odds ratio
Non-recipient	4.16 (0.743)	4.55**	2.91 (0.771)	3.72*	1.61 (0.841)	2.91
Borrow			0.042 (1.17)	1.27	0.100 (1.31)	1.51
Distance from school			1.15 (0.014)	1.01	0.666 (0.017)	1.01
Father years of school					1.65 (0.141)	1.19
Mother years of school					2.17 (0.167)	0.782
Wealth index					0.727 (0.546)	1.59
Constant	−2.27 (0.606)	0.103**	5.56 (1.13)	0.069**	1.78 (1.95)	0.074
Observations	57		54		49	
R^2 (Cox and Snell)	0.08		0.10		0.14	

Note(s): Standard errors in parentheses; ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

Table 4. Logistic regression results, school withdrawal

scholarship recipients complete an additional 1.03 and 1.51 years of schooling (for secondary and tertiary students, respectively) than non-recipients. This effect is reduced only slightly (to 0.95 and 1.48 additional years of school) after controlling for household income, father education, mother education, and the index of household wealth (Table 5).

The final educational measure of the scholarship's impact is the difference in graduation rates between treatment and comparison groups. Findings show that at both secondary and college levels, between 94 and 100% of recipients are graduating compared to 50 and 19% for non-recipients. This was a significant difference for both secondary and college students.

Overall, the findings related to educational outcomes show that the scholarship increases attainment and graduation rates for secondary and college students. Scholarship recipients also experience fewer absences and lower rates of withdrawal from school; however, these effects are non-significant, after controlling for the full set student demographic characteristics. These findings provide evidence of strong household desire for education, which is restricted by the cost of schooling. After removing the cost constraints, students are far more likely to remain in and complete each respective level of schooling.

Employment and income

Having addressed differences in educational outcomes for recipients and non-recipients of the ETC scholarship, we next investigate differences in three post-schooling outcomes: rate of

	(1) Highest grade level		(2) Highest grade level	
	Secondary	Tertiary	Secondary	Tertiary
Recipient	1.03*** (0.314)	1.51*** (0.330)	0.95** (0.36)	1.48*** (0.34)
Income			0.00 (0.00)	0.00 (0.00)
Father's education			0.04 (0.04)	0.12* (0.07)
Mother's education			0.00 (0.06)	−0.03 (0.06)
Wealth index			0.95 (0.36)	1.48 (0.34)
Constant	13.76*** (0.245)	11.20*** (0.273)	10.83*** (0.69)	12.54*** (0.62)
Observations	40	46	37	44
R-squared	0.215	0.317	0.268	0.401

Note(s): Standard errors in parentheses; ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

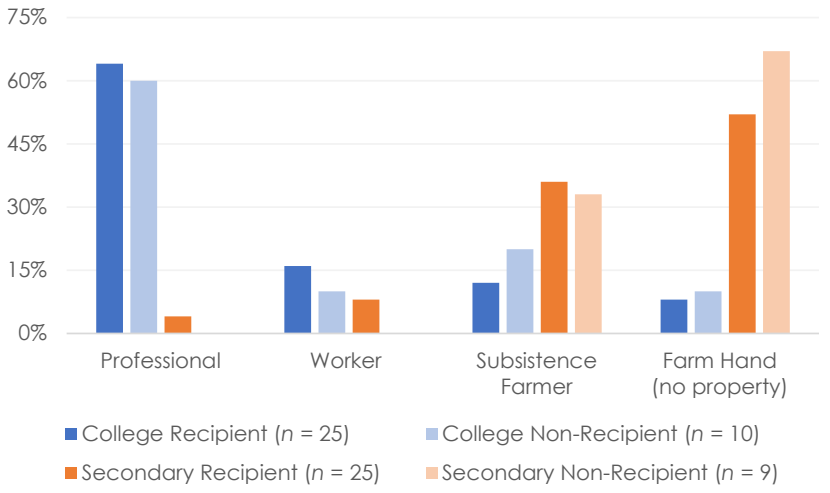
Table 5. OLS regression results, highest grade level reached

employment, type (i.e. quality) of employment, and level of income. Given that this part of the analysis is concerned with potential outcomes after students have finished school, we constrain the sample in this section to those who are no longer enrolled in school.

We find that, for those who did not progress beyond secondary school, scholarship reception is associated with an employment rate increase of 18 percentage points. However, there is little difference in employment rates for recipients vs non-recipients after secondary school (2 percentage points). There were also a number of non-recipients who remained in college past the time of their expected graduation. When asked why they placed a hold on their schooling, most students cited inability to pay. Overall, students who participated in any kind of higher education were employed at substantially higher levels than those who received only a secondary-level education.

Figure 1 shows the distribution of occupational classifications for recipients and non-recipients at both schooling levels. Some of the key takeaways include the following: 30% of college non-recipients were returning to farm-based activity (subsistence and farm hand) after schooling completion compared to only 20% of recipients. We see that, for secondary students, a slightly larger share of recipients were entering the non-farm workforce (12%) as compared to non-recipients (0%). However, the key finding seems to be that the most important determinant of movement from farm-based occupations towards more professional occupations is college attendance, as opposed to scholarship reception.

We use OLS regression to test for the predictors of occupational quality. There is no difference in occupation quality between scholarship recipients and non-recipients. Consistent with the finding above, the strongest predictor of occupation quality is attendance of post-secondary schooling. Students with only secondary-level education score 2.9 points (0.51 SD) lower on the job quality index than those with post-secondary education. For the secondary-only students, females score 1.2 points (0.21 SD) lower on the occupation quality index than males. This may be explained, in part, by the fact that many female



Note(s): *'Workers' here are defined as skilled workers in a variety of areas such as service workers, shop sales workers, skilled agricultural and fishery workers, craft and related workers and plant and machine operators. The groups were simplified into four categories because all responses fell into one of these four groups

Figure 1. Occupational classifications by recipient status and schooling level*

students must return to their family farms after school in order to care for their parents – a finding that emerged from our qualitative interviews with the participants.

Lastly, we examine the relationship between scholarship reception and income after participants are no longer in school. On average, former scholarship recipients who attended only secondary school are earning $209 per year, compared to $138 for non-recipients who attended only secondary. For those who received post-secondary schooling, former scholarship recipients are earning $1,286, while non-recipients are earning $507. We test for the statistical significance of these findings, controlling for potential confounding variables, using separate OLS models for former secondary and tertiary students. Results are presented in Table 6. Findings suggest that annual wages are significantly higher for tertiary recipients than non-recipients (mean difference = $727; $p = 0.019$; Cohen's $d = 1.15$). However, the annual wage difference between former secondary recipients and non-recipients is not statistically significant. This might be explained by the fact that most secondary graduates were returning to farm-based labor in their home villages, therefore minimizing the potential financial benefit of any added secondary schooling. Clearly, the predictor that most impacts future earnings is participation in post-secondary education. As such, it appears that one of the primary aims of the education system in Malawi should be to increase the number of youth accessing post-secondary education opportunities.

Discussion and conclusion

This study provides new insights on constraints to schooling access and completion, as well as possible solutions for supporting student persistence through school. Every student, both recipient and non-recipient faced out-of-pocket expenses to attend school. These expenses were used to cover uniforms, books and stationary, transportation, groceries, computers, etc. Of the 57 current students, only 10 stated that they did not borrow any money for school-based expenses. The average cost for non-recipients was $593 at the tertiary level and $41 at the secondary level; in contrast, the costs were $214 and $11 for tertiary and secondary recipients, respectively. This is a significant difference; however, even these reduced costs can still be burdensome for many families in rural Malawi. That said, college recipients still graduated at a rate of 100%, and secondary recipients were just below 100%, suggesting that notwithstanding these out-of-pocket expenses, the added help of the scholarship seems to provide families sufficient additional capital to keep their children in school.

Results provide evidence that scholarships for secondary and college students help break down barriers that constrain students from being able to enroll, progress, and graduate from school. Our findings show that, overall, scholarship recipients are accessing boarding schools, attending school, and avoiding withdrawal at higher rates than their non-recipient peers. In

Table 6.
OLS regression, annual wage (adjusted for number of months actually worked)

Variables	Adjusted annual wage	
	Secondary	Tertiary
Recipient	−37.9 (51.4)	727.1** (290.6)
Father's education	−3.1 (6.6)	−39.9 (55.7)
Mother's education	0.103 (8.2)	37.9 (53.8)
Final year of school	13.8 (29.5)	−11.0 (48.8)
Wealth index	305.6*** (56.3)	202.3 (148.5)
Constant	−27,502 (59,611.2)	22,680 (98,414.7)
Observations	27	31
R-squared	0.616	0.286

Note(s): Standard errors in parentheses
***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

part, this is due to a reduction in the out-of-pocket costs associated with attending school. A substantial contributor at the secondary level is that scholarship reception substantially reduces the distance that students travel to school, thus enabling more frequent participation.

On average, scholarship recipients attain an additional year of schooling and graduate at a significantly higher rate than non-recipients. Additionally, we find some positive labor-market outcomes for scholarship recipients. Scholarship reception is associated with a higher rate of employment for former secondary students (although, not for former tertiary students). However, former tertiary recipients have higher annual wages than their non-recipient counterparts. Lastly, there is no relationship between scholarship reception and quality of occupation.

The results offer a strong case for the necessity of education beyond the secondary level. When assessing predictors of future employment opportunities and financial returns, the most consistent determinant is some level of participation in post-secondary schooling, with former tertiary students having consistently higher labor-market outcomes across all measures. Secondary schooling does not equate to more consistent employment or better-quality occupations for rural students. Secondary school graduates who fail to receive higher education are likely to remain in agriculture-based employment, and are typically no better off than those who failed to complete their secondary education. Moreover, secondary schools do not provide any agricultural-based education, and thus are unlikely to improve agricultural productivity for secondary graduates.

This study adds new evidence to the existing literature on the expansion of schooling participation at the secondary and higher education levels. This is relevant for Malawi as well as other countries in Africa and beyond who are pursuing the Sustainable Development Goal target 4.1 of universal secondary school completion. Currently only 27% of students in Sub-Saharan Africa and 14% of students in Malawi are completing upper secondary school (UNESCO, 2018). Results from this study suggest that means-tested scholarship programs can increase school attendance through demand-side mechanisms. By covering all or part of the direct cost of tuition, housing, and other expenses, scholarships remove at least part of the financial burden that discourages cash-constrained households from sending their children to school and keeping them in school. Such scholarships help some of the most vulnerable students access and progress through the education system. However, provision of demand-side financing at only the secondary school level might not directly translate to better labor opportunities or improved livelihoods for many rural students. When asked why they did not progress towards any post-secondary education opportunities, students most commonly cited their inability to pay. Ultimately, financial support for students may offer greater value by combining funding for secondary and post-secondary schooling to provide students with the skills necessary to enter the formal labor market. Governments and civil-society partners might consider expansion of similar programs to continue addressing demand-side constraints as they continue to work towards universalizing secondary school completion.

Notes

1. Primary net enrollment in Sub-Saharan Africa increased from 57.2% to 77.3% (20 percentage points) between 1998 and 2016, compared to an increase from 19.6% to 33.6% (14 percentage points) at the secondary level (World Bank, 2018).
2. Other common constraints to school attendance in Africa include disability, early pregnancy or marriage, distance from school, and socio-cultural factors, among others (Sineta, 2012; Wodon *et al.*, 2017; World Bank, 2018).
3. The abolition of school fees resulted in an increase of primary school enrollments from 1.9 million in 1993 to 2.9 million in 1994 (Inoue and Oketch, 2008).
4. By 2010, the average 15–19 year old in Malawi had completed 4.0 years of primary school and only 0.5 years of secondary school (World Bank, 2018).

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