



Addressing the Burden of Education Financing in Low and Lower-Middle-Income Countries: The Role of Savings Accounts, Cash Transfers, and Other Income Sources

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Abstract

Cost-sharing between governments and families remains a strategic part of many governments' post-secondary education funding policies in low-income countries. This shift to more cost-sharing raises questions about how households meet their contributions to post-secondary schooling costs. This study uses data from the World Bank's Global Financial Inclusion survey and World Development Indicators to examine how savings account ownership, cash transfers, and other forms of income shape families' decisions about education financing in 59 low and lower-middle-income countries. Results from generalized hierarchical linear modeling and logistic regression models show that individuals with savings accounts are more likely to dedicate resources to educational purposes than those without accounts. Other forms of income (cash transfers excepted) also predict an individual's likelihood of earmarking savings for education to a lesser degree. Our findings offer compelling evidence that greater access to formal savings services may provide a viable long-term strategy to help families prepare financially for their children's future education. These findings may inform future programs that promote financial inclusion and expand access to formal savings services to help individuals and families save for their children's education.

Keywords Education funding · Cash transfer · Savings account · Low-income country · Lower-middle-income country · Generalized hierarchical linear modeling

Introduction

This comparative study examines how families in low-income and lower-middle-income countries prepare financially for children's future education and the extent to which three forms of income (i.e., cash transfers, wages, and agrarian income) and savings account ownership influence their ability to do so. Although education is not the only means to develop and enhance social, cultural, and economic well-being, it significantly enables an individual to make a positive difference in their personal life and society's well-being (Gruber & Kosack, 2014). Because of education's transformative power, 165 countries adopted the Dakar Framework for Action in 2000 to commit to the six goals of Education for All by 2015, including universally free and compulsory primary education (UNESCO, 2015). However, progress toward achieving these goals has been slow. In 2018, 258.4 million children globally remained unenrolled in school: 59.1 million children of primary school age, 61.5 million adolescents of lower secondary school age, and 137.8 million youth of upper secondary school age (UNESCO

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Institute for Statistics, 2019). The high number of out-of-school children, adolescents, and youth is disproportionately concentrated in some regions of the world. Sub-Saharan Africa leads with the highest out-of-school rates across all three education levels (primary: 18.8%; lower secondary: 36.7%, and upper secondary: 57.5%) (UNESCO Institute for Statistics, 2019). Thus, in this study, in addition to focusing on all low-income and lower-middle-income countries, we pay additional attention to the sub-Sahara African region.

Progress in achieving these goals lags in sub-Saharan Africa and many low-income countries, where education financing presents a critical challenge at national and household levels. Many governments, particularly in low-income countries, are under pressure to guarantee primary education and expand access to secondary and post-secondary education because of the increasing global demand for a well-educated workforce (Kattan, 2006; Steer & Smith, 2015; UNESCO Institute for Statistics, 2011). For this reason, many countries have increased their education expenditure as a share of GDP. Sub-Saharan Africa increased its spending on education from 2.65% of GDP in 2000 to 3.98% in 2018. All low-income countries combined experienced a similar increase from 2.65 to 3.45% of GDP (World Bank, 2014b). About 60 countries with developing and developed economies have also adopted social protection policies that increase their governments' capacity to provide cash transfers to vulnerable households to help them overcome financial barriers to primary education (Davis et al., 2016; International Labour Office, 2014; UNESCO, 2015).

Despite these policy trends, education remains significantly under-financed globally. Education funding allocation in many countries has generally remained below the recommended 15–20% of the national budget needed to bridge funding gaps (UNESCO, 2015). Moreover, while many low-income countries have experienced a significant policy push to provide free primary and secondary school, this has not been the case at the post-secondary level. Increasingly, following a wave of Structural Adjustment Programs in the 1980s and 90s in sub-Saharan Africa and other low-income countries, cost-sharing became a key part of many governments' post-secondary education financing policies, and households started bearing more of the cost of education (Amankona et al., 2018; Johnstone & Marcucci, 2007, 2010). Today, in sub-Saharan African countries like Uganda, household funding accounts for more than half of all education expenditures; in low-income countries such as Nepal, households fund half of all education expenditures (UNESCO Institute for Statistics, 2016).

With few exceptions, the idea of personal responsibility has significantly shaped the policy discourse on education financing in countries with high- and low-income economies. The ample evidence that the returns on education investment tend to be higher for individuals than

for society is sometimes cited as a reason governments spread the responsibility for education costs (Experton & Fevre, 2010; Lewin, 2020). The often-cited direct return on human capital investment is improved job prospects, ultimately translating into income and wealth creation for individuals and their families (Romanello, 2017). On the other hand, human capital investments invariably generate returns beyond the individual (i.e., societal implications), not the least among which are crime reduction (Lochner & Moretti, 2004) and improvement in social interactions and community social capital, all of which affect countries' productivity (Putnam, 2000; Romanello, 2017). Thus, the private and social returns on education are bidirectionally linked in that both forms of returns interactively have implications on each other. It is, therefore, imperative that adequate investments are made in human capital development.

Per the current human capital investment trends, government education expenditures in low-income countries are not growing enough to absorb all the costs of educating their citizens. It has also become apparent that because education is a high-priority expenditure for many households, students and their families adopt a range of strategies (sometimes simultaneously) to pay for schooling or make up for the funding shortfalls in subsidized education (Hopper, 2015). Some sell off personal or family property to pay school fees; some take on supplemental jobs or secure loans to meet education costs such as tuition fees, living expenses, and books (Salmi, 2015; Woodhall, 2015). Others accumulate financial savings to pay for school fees and expenses (Deshpande & Zimmerman, 2010; Goldberg, 2014). In light of the global increase in cost-sharing in education, researchers and policymakers should further examine what strategies families employ to meet the cost of schooling (particularly at the post-secondary level) and the relative prevalence and effectiveness of these strategies.

The present study assesses whether and how several of these strategies (i.e., cash transfers, wage-earning, and savings accounts) shape household financial planning for future education costs. Because the push for students and families to take personal responsibility for paying (at least in part) for education is driving current trends in education financing (Elliott & Lewis, 2014), research on households' saving strategies is fundamental to the global discourse on education financing and may have implications for future education cost-sharing policies. Robust evidence on how families in low-income countries draw on government cash transfers, wages, and personal financial assets to fund education could inform current strategies and social policies designed to increase education access at all levels.

How Savings Accounts and Income Motivate the Propensity to Save for Education

Studies from both high-income and resource-constrained countries suggest that one of the salient motivations for individuals' and households' financial saving behaviors is their investment in future education, particularly of children and grandchildren (Bricker et al., 2012; Johnson et al., 2015; Kim et al., 2018; Lee & Hanna, 2015; Nam et al., 2016). Young people, who save or participate in youth savings programs, often cite higher education as a primary saving goal (Johnson et al., 2018; Karimli & Ssewamala, 2015). Yet, in practice, the critical question remains: to what extent do income and these saving strategies enable families to save for education costs?

Several economic theories (e.g., life-cycle hypothesis, permanent-income hypothesis, and Keynesian general theory) shed light on how various forms of income shape the propensity to save for the future (Ando & Modigliani, 1963; Cohen, 1994; Friedman, 1957; Keynes, 2016). Some of these theories argue that when people have adequate income now, they are better positioned to save some for future use. Others suggest that fears about a possible mismatch between future needs and available resources motivate people to accumulate savings to prepare for future economic contingencies. Indeed, the theory of change underwriting many cash transfer programs draws on variants of these economic theories to support offering immediate income in the hopes of smoothing consumption throughout the life span of beneficiary families. Whether they focus on current or future income, these economic theories collectively argue that current income generally affects whether people spend or save. This study hypothesizes that individuals with current income are more likely to save for educational needs based on these economic theories.

Beyond an individual's income, their access to saving services and opportunities affects their savings and investment actions. The institutional theory of saving (Han & Sherraden, 2009; Heckman & Hanna, 2015) and the financial capability framework (Sherraden, 2013) highlight institutions' role in shaping saving preferences and actions. The institutional theory contends that institutional factors regarding saving (i.e., access, information, incentives, facilitation, restrictions, and disincentives) strongly affect whether and how people save (Chowa et al. 2012a; Sherraden & Ansong, 2016). Ansong et al. (2020) expand on the utility of the financial capability framework in sub-Saharan Africa and other resource-constrained contexts. They explain how personal factors (e.g., education, employment, and resources) and institutional factors (e.g., policies on access to financial services and products) improve financial literacy and

financial inclusion; these, in turn, shape individuals' financial behaviors and practices, including savings for education.

In this study, we examine how *access* to formal savings services may foster the habit of saving for education. Prior research suggests that access to formal saving services can help people save, regardless of their level of wealth (Ashraf et al., 2010; Chowa et al., 2012b; Johnson et al., 2018; Lee et al., 2017; Peprah et al., 2015). Thus, we hypothesize that families who have access to a formal savings account will more likely save for educational needs than families without access to saving services.

As global policies increasingly shift the burden of education financing from governments to families, different education savings programs (e.g., Child Development Accounts, Coverdell Education Savings Accounts, and 529 college savings plans Elliott & Lewis, 2014) have become standard in countries with developed economies like the United States. As these education financing mechanisms increasingly shape policy discussions in sub-Saharan Africa and other low-income economies by offering a viable complement to other financing strategies, empirical evidence must drive these discussions. This study builds on extant literature on education financing in low- and lower-income settings by exploring how formal savings account ownership and various forms of income shape families' strategies to prepare for education expenses. With many governments and policy-makers accepting the feasibility of creating savings accounts for all citizens (Loke & Sherraden, 2009; Masa, 2009; Lundberg & Mulaj, 2014), stakeholders should determine the best evidence-backed education savings account programs for children. The present study makes a timely contribution to the body of empirical evidence needed to clarify the critical determinants of savings for education to optimize savings programs in practice. To that end, this study examines how access to income and savings accounts predict the likelihood of saving for education.

Methods

Data and Study Design

We obtained microdata and country-level data for this study from the World Bank's Global Findex Inclusion (Global Findex) database (World Bank, 2014a) and its World Development Indicators database (World Bank, 2014b), respectively. Gallup, Inc. led the data collection for the Global Findex project, which primarily gathered data through face-to-face interviewer-administered surveys with 150,000 people in 143 countries, with survey periods lasting between two and four weeks in each country. The sample size for the current study is reduced (~14,000) because of the focus on families who pay school fees in low- and lower-middle-income

countries. In a few cases, surveys were conducted by telephone. A nationally representative sample of approximately 1000 people, 15 years of age and above, was recruited in each country. Data weights were applied to ensure nationally representative samples.

Two country-level measures were obtained from the World Bank's World Development Indicators and merged with the individual-level Findex data. The World Development Indicators contain over 1,400 national development indicators and estimates from over 200 countries spanning over five decades. Recognized international sources such as the UNESCO Institute for Statistics compile this data periodically. The present study used the 2014 edition of both the Global Findex data and the World Development Indicators to ensure a logical temporal sequence of the predictors and the outcome variable.

Measures

Outcome

Saving for education is a binary outcome. Respondents were asked: "In the past 12 months, have you, personally, saved or set aside any money...for education or school fees?" This variable reflects the money set aside through all kinds of saving mechanisms: formal, semi-formal, and informal arrangements. A Yes response was coded 1, and a No coded 0.

Predictors of Interests

The study assessed one account ownership variable and three income variables as predictors of interest. Account ownership is a binary predictor that measured whether a respondent had an account at a financial institution, through a mobile money account or both. It was coded 1 (Yes) or 0 (No). The first income indicator—receives wages—is a binary measure of whether the respondent was a salary or wage earner. Respondents were asked, "Have you received any money from an employer or boss, in the form of salary or wages, for doing work in the past 12 months?" The second income variable—receives government cash transfers—is a binary measure of whether respondents received financial support from the government in the form of payments for educational or medical expenses, unemployment benefits, subsidy payments, or social benefits. The third income indicator—receives agricultural income—measures whether respondents earned agrarian income. Respondents were asked to indicate whether they had personally received money from any source for the sale of their own or family's agricultural products, crops, produce, or livestock in the past 12 months. All three income indicators were coded 1 (Yes) or 0 (No).

Individual-Level Covariates

Age is a continuous covariate measured in years. Male refers to the sex of respondents, with 1 denoting male and 0 denoting female. A household-level variable representing household income quintile (within a specific country) was accounted for in the models. Respondents were classified into five income quintiles: poorest 20%, second 20%, third 20%, fourth 20%, and the richest 20%. The wealthiest quintile was designated as the reference group. Respondents' education level was assessed initially as a polychotomous variable with three response options: completed primary or less, secondary, and completed tertiary or more. For the statistical modeling, "completed primary or less" was designated as the reference group.

Country-Level Covariates

Government expenditure per student is a continuous variable measuring government expenditure per student at the post-secondary level. The variable is expressed as a percentage of GDP per capita. Country income status is a polychotomous measure of a country's income level based on its gross national income (GNI) per capita, calculated by the World Bank for the 2014 calendar year. Countries with a GNI per capita of \$12,735 or more were classified as high-income, between \$4,125 and \$12,735 as upper-middle-income, between \$1,046 and \$4,125 as lower-middle-income, and \$1,045 or less as lower-income. In the current study, low-income and lower-middle-income countries were the focus of the statistical analyses. In a follow-up analysis, we zeroed in on sub-Saharan Africa.

Data Analysis

Following best practices, we split the sample into calibration and validation samples (Galvao et al., 2005). We used the calibration sample ($N_{\text{individuals}} = 7,439$; $N_{\text{countries}} = 59$) to test the models, and the validation sample ($N_{\text{individuals}} = 7,390$; $N_{\text{countries}} = 59$) to replicate the model to assess consistency. We also conducted three subset analyses which focused on low-income countries only ($N_{\text{individuals}} = 4,882$; $N_{\text{countries}} = 18$), lower-middle-income countries only ($N_{\text{individuals}} = 9,110$; $N_{\text{countries}} = 9$), and sub-Saharan African countries only ($N_{\text{individuals}} = 7,439$; $N_{\text{countries}} = 28$). We examined the intra-class correlation coefficients (ICC) to identify any possible violations of the independence of observation assumption and the need for multilevel logistic regression modeling, given the data's nested structure (i.e., individuals clustered in countries). As shown in Table 3, the ICC for the full sample was 0.0756 and even smaller for the subgroups ($ICC_{\text{low-income}} = 0.0368$; $ICC_{\text{lower-middle-income}} = 0.0027$; $ICC_{\text{sub-Saharan Africa}} = 0.0306$). These low ICCs mean that the differences between countries explain 0.27–7.56% of the

variance in how people set aside money for education and school fees. Excepting the full sample, the low ICCs confirm negligible clustering in the data, suggesting that multilevel modeling was unnecessary for our analyses. To be more conservative, we decided to run generalized hierarchical linear models (GHLM) with the full sample, using the *meglm* syntax in Stata 15. For the subset analyses of low-income countries, lower-middle-income countries, and sub-Saharan African countries, we used the *logit* syntax with the clustered sandwich estimator to run logistic regression models. The clustered sandwich estimates ensured that the standard errors allowed for intragroup (i.e., intra-country) correlations.

To conduct the GHLM, we used an incremental modeling approach, starting with the null model (to calculate the ICC) followed by a random intercept model with individual-level and country-level fixed effects. Age and age-squared were reparameterized at their grand means to avoid potential collinearity violations. Interaction effects were tested in all models. The final GHLM model can be written as follows:

$$\log\left(\frac{Y_{ij}}{1 - Y_{ij}}\right) = \gamma_0 + \gamma_1(\text{account})_{ij} + \gamma_2(\text{cash transfers})_{ij} + \gamma_3(\text{wages})_{ij} + \gamma_4(\text{ag. income})_{ij} + \gamma_5(\text{account} \times \text{cash transfers})_{ij} + \gamma_6(\text{account} \times \text{wages})_{ij} + \gamma_7(\text{account} \times \text{ag. income})_{ij} + \gamma_8(\text{age})_{ij} + \gamma_9(\text{age})_{ij}^2 + \gamma_{10}(\text{male})_{ij} + \gamma_{11}(\text{poorest})_{ij} + \gamma_{12}(\text{second poorest})_{ij} + \gamma_{13}(\text{third poorest})_{ij} + \gamma_{14}(\text{fourth poorest})_{ij} + \gamma_{15}(\text{secondary})_{ij} + \gamma_{16}(\text{tertiary})_{ij} + \gamma_{17}(\text{gov't expenditure})_{ij} + \gamma_{18}(\text{lower middle income})_{ij} + u_{0j} + u_{1j}(\text{account})_{ij} + u_{2j}(\text{wages})_{ij} + r_{ij}$$

where Y_{ij} denotes whether the i th person in the j th country saves for education, γ_0 represents the adjusted probability of savings across countries, γ_1 to γ_{16} represent the regression coefficients for the individual-level predictors for the i th person, and γ_{17} and γ_{18} represent country-level regression coefficients for the j th country. Additionally, u_{0j} , u_{1j} , and u_{2j} are the random effects at the country level, and r_{ij} denotes the individual-level error term, which is the 3.29 constant.

Because we included multiple measures of income in the statistical models (i.e., a set of binary indicators for government

cash transfers, wages, agrarian income, and income quintiles), we used point-biserial correlations to assess the strength of associations between the income measures to flag possible redundancies. Point-biserial correlation coefficients (r_{pb}) range from -1 to $+1$, where ± 1 indicates perfect negative and positive associations and 0 indicates no association. Table 1 shows that all the point-biserial correlation coefficients ($r_{pb} = -0.002$ to 0.253) indicate weak associations between the binary income indicators. These results confirm no significant overlap between the income indicators and that the different income indicators reflect various aspects and sources of income.

Results

Descriptive Characteristics

Table 2 presents the full sample’s descriptive characteristics and the three subgroups assessed in this study: low-income,

lower-middle-income, and sub-Saharan African countries. Most respondents reported setting aside money for education and school fees across the whole sample and three subgroups. The majority of respondents in the full sample (51%), low-income subsample (53%), and the sub-Saharan African subsample (55%) were male, but most respondents in the lower-middle-income subsample were female (51%). On average, respondents were about 36 years old ($SD = 13.38$). Overall, only about a tenth of the sample had completed tertiary education (11%), while more than half had completed secondary education (59%).

Table 1 Results of point-biserial correlation between all binary income variables

	Receives wages	Receives cash transfer	Earns agrarian income	Income quintile (poorest)	Income quintile (second)	Income quintile (third)
Receives cash transfer	- 0.020*					
Receives agrarian income	0.079*	- 0.002				
Income quintile (poorest)	0.088*	- 0.045*	- 0.026*			
Income quintile (second)	0.049*	- 0.037*	- 0.037*	0.210*		
Income quintile (third)	0.019*	- 0.017*	- 0.010*	0.220*	0.231*	
Income quintile (richest)	- 0.031*	0.025*	0.006*	0.230*	0.242*	0.253*

* $p < 0.05$

Table 2 Descriptive characteristics

Variables	Full sample	Low-income countries	Lower-middle-income countries	Sub-Saharan African countries
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
Age***	36.05 (13.38)	35.98 (13.81)	36.15 (13.14)	35.93 (13.56)
Gov't expenditure per student***	113.67 (174.98)	213.82 (239.28)	46.39 (38.07)	200.09 (221.85)
	Freq. (%)	Freq. (%)	Freq. (%)	Freq. (%)
Saves for education***				
No	7266 (49)	2343 (48)	4464 (49)	2133 (45)
Yes	7563 (51)	2539 (52)	4646 (51)	2606 (55)
Gender***				
Female	7328 (49)	2295 (47)	4646 (51)	2133 (45)
Male	7501 (51)	2587 (53)	4464 (49)	2606 (55)
Education***				
Completed primary or less	5932 (40)	2685 (55)	3189 (35)	2085 (44)
Completed secondary or less	7266 (49)	2002 (41)	4737 (52)	2275 (48)
Completed tertiary or less	1631 (11)	195 (4)	1184 (13)	379 (8)
Has a savings account***				
No	7859 (53)	2783 (57)	4646 (51)	2464 (52)
Yes	6969 (47)	2099 (43)	4464 (49)	2275 (48)
Receives wages***				
No	10,677 (72)	3759 (77)	6377 (70)	3459 (73)
Yes	4152 (28)	1123 (23)	2733 (30)	1280 (27)
Receives cash transfer***				
No	12,012 (81)	4540 (93)	8199 (90)	4407 (93)
Yes	1335 (9)	342 (7)	911 (10)	332 (7)
Earns agrarian income***				
No	9342 (63)	2539 (52)	6286 (69)	2559 (54)
Yes	5487 (37)	2343 (48)	2824 (31)	2180 (46)

*** $p < 0.001$

Across the full sample and all three subsamples, most respondents reported having no savings account, although a higher percentage of respondents in lower-middle-income countries had a savings account (49%) compared to those in low-income countries (43%). In both the full sample and the three subsamples, the overwhelming majority (> 80%) of respondents were not recipients of government cash transfers.

Multivariate Results

This section presents the GHLM and logistic regression results, starting with the GHLM results for the full sample (Model 1; all models appear in Table 3), followed by the logistic regression results from the full sample (Model 2) and the three subsamples (low-income countries, Model 3; and lower-middle-income countries, Model 4; and sub-Saharan Africa, Model 5). For the GHLM, we compared a null model and three incrementally more complex models.

Multilevel models with the smallest AIC and BIC values (i.e., 2+ difference) and significant Wald χ^2 results were selected as the best fit to the data. We used the Wald χ^2 results to assess the fit of the logistic regression models.

All the models confirm that an individual's ownership of a bank account with a formal financial institution is the strongest predictor of their likelihood of saving specifically for education-related expenses. Namely, our results showed that individuals with formal accounts were 53–66% more likely to prepare financially for educational expenses compared to those without a savings account: GLHM full sample [odds ratio (*OR*) = 1.64, $p < 0.001$, Model 1], logistic full sample (*OR* = 1.53, $p < 0.001$, Model 2), low-income countries (*OR* = 1.65, $p < 0.001$, Model 3), lower-middle-income countries (*OR* = 1.64, $p < 0.001$, Model 4), and sub-Saharan Africa (*OR* = 1.66, $p < 0.001$, Model 5). In short, having some form of formal savings account translated into a greater likelihood that an individual would proactively save for future education

Table 3 Results of the likelihood of saving for educational purposes and school fees

	GHLM		Logistic regression		
	Model 1: full sample <i>OR (SE)</i>	Model 2: full sample <i>OR (RSE)</i>	Model 3: low-income countries <i>OR (RSE)</i>	Model 4: lower-middle-income countries <i>OR (RSE)</i>	Model 5: sub-Saharan African countries <i>OR (RSE)</i>
Predictors of interest					
Has savings account (γ_1)	1.64 (0.17)***	1.53 (0.19)***	1.65 (0.22)***	1.64 (0.36)*	1.66 (0.25)**
Cash transfers (γ_2)	1.05 (0.15)	1.17 (0.16)	1.40 (0.40)	1.65 (1.17)	1.44 (0.44)
Receives wages (γ_3)	1.34 (0.12)**	1.35 (0.15)**	1.49 (0.23)*	1.58 (0.39)	1.49 (0.28)*
Earns agrarian income (γ_4)	1.29 (0.13)*	1.37 (0.16)**	1.37 (0.18)*	2.01 (0.39)***	1.37 (0.21)*
Interactions					
Has savings account \times cash transfers (γ_5)	0.93 (0.20)	0.84 (0.17)	0.57 (0.21)	0.55 (0.45)	0.58 (0.24)
Has savings account \times receives wages (γ_6)	0.93 (0.11)	0.97 (0.13)	0.84 (0.18)	1.01 (0.33)	0.89 (0.19)
Has savings account \times receives Ag. income (γ_7)	1.16 (0.16)	1.27 (0.19)	1.47 (0.25)*	0.93 (0.28)	1.31 (0.24)
Covariates					
Age (centered) (γ_8)	1.04 (0.01)**	1.04 (0.01)**	1.04 (0.02)*	1.12 (0.03)***	1.05 (0.02)*
Age ² (centered) (γ_9)	1.00 (<.01)***	1.00 (<.01)***	0.99 (<.01)*	0.99 (<.01)***	1.00 (<.01)*
Male (ref = female) (γ_{10})	1.06 (0.07)	1.03 (0.07)	0.99 (0.08)	1.21 (0.18)	1.00 (0.10)
Income quintile^a					
Poorest 20% (γ_{11})	0.61 (0.05)***	0.60 (0.06)***	0.63 (0.13)*	1.03 (0.19)	0.69 (0.11)*
Second 20% (γ_{12})	0.77 (0.08)**	0.76 (0.07)**	1.18 (0.25)	0.92 (0.36)	1.11 (0.19)
Third 20% (γ_{13})	0.80 (0.06)**	0.81 (0.06)**	0.85 (0.12)	0.84 (0.15)	0.86 (0.10)
Fourth 20% (γ_{14})	0.87 (0.05)*	0.88 (0.05)*	0.98 (0.12)	1.06 (0.20)	1.00 (0.10)
Secondary education (γ_{15}) ^b	0.98 (0.08)	0.97 (0.10)	0.98 (0.13)	0.75 (0.12)	0.88 (0.10)
Tertiary education (γ_{16}) ^b	1.18 (0.15)	1.13 (0.20)	1.40 (0.42)	1.31(0.39)	1.39 (0.29)
Country-level predictors					
Gov't expenditure on per tertiary student (γ_{17})	1.00 (<.01)***	1.00 (<.01)*	1.00 (<.01)*	0.99 (0.001)	1.00 (<.01)*
Lower-middle-income country (γ_{18}) ^c	1.03 (0.20)	1.10 (0.22)			1.31 (0.26)
Intercept (γ_0)	0.69 (0.11)*	0.71 (0.12)*	0.72 (0.17)	0.78 (0.20)	0.67 (0.14)
Random effects (variance components)					
Community-level intercept (u_{0j})	1.18 (0.10)*				
Account (u_{1j})	1.00 (<.01)				
Receives wage (u_{2j})	1.31 (0.09)***				
Model fit indices					
Wald χ^2 (df)	402.22 (18)***	412.06 (18)***	138.34 (17)***	93.20 (17)***	3045.07 (18)***
N _{individuals} /N _{countries}	10,075/41	10,075/41	3537/16	1296/5	4833/21
ICC	0.0756	0.0756	0.0368	0.0027	0.0306

Reference groups: ^afifth 20% quintile; ^bprimary/no education; ^clow-income country

OR odds ratio, *SE* standard error, *RSE* robust standard error

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

costs. This finding aligns with one of the central tenets of the institutional theory of saving and financial capability framework: institutional factors such as access to saving opportunities shape saving preferences and actions (Heckman & Hanna, 2015; Nam et al., 2008).

On the question of whether an individual's income predicts their likelihood of saving for future education, our results were mixed: we found that this likelihood depended on the type of income. We did not find sufficient evidence to support the hypothesis that cash transfers were associated with

the likelihood of saving for future education ($p > 0.05$). However, our findings showed that receiving other types of income (i.e., agricultural income and wages) positively predicted the tendency to save for future education. Agricultural income earners were more likely to save for educational purposes compared to non-agricultural income earners. This trend was particularly visible in lower-middle-income countries, where agrarian income earners were twice as likely as non-earners to prepare financially for future education: GHLM full sample ($OR = 1.29, p < 0.05$, Model 1), logistic full sample ($OR = 1.37, p < 0.01$, Model 2), low-income countries ($OR = 1.37, p < 0.05$, Model 3), lower-middle-income countries ($OR = 2.01, p < 0.001$, Model 4), and sub-Saharan Africa ($OR = 1.37, p < 0.05$, Model 5). Similarly, respondents who earned salary or wages had an additional 34–58% predicted probability of preparing financially for future education compared to those who did not earn salaries or wages: GHLM full sample ($OR = 1.34, p < 0.01$, Model 1), logistic full sample ($OR = 1.35, p < 0.01$, Model 2), low-income countries ($OR = 1.49, p < 0.05$, Model 3), and sub-Saharan Africa ($OR = 1.49, p < 0.05$, Model 5). The predictive role of wages was marginal only in lower-middle-income countries ($OR = 1.58, p = 0.06$, Model 4).

Except for one interaction term (i.e., the interaction between account ownership and agrarian income), none of the interactions between account ownership and different forms of income predicted the likelihood of saving for education. In low-income countries (where one interaction was significant), individuals who had both accounts and earned agrarian income were 1.47 times as likely to save for future education as those with neither an account nor agrarian income ($p < 0.05$). Other interaction terms (e.g., the interaction between account ownership and government expenditure on students) were neither significant nor influential on the model results. We excluded all such interaction terms from the final models to keep the models parsimonious. Besides the predictors of interest—account ownership and different income sources—, other individual-level covariates (i.e., age and income quintiles) and one country-level covariate (i.e., government expenditure on students) were significantly and positively associated with the tendency to save for future education (see Table 3).

Discussion and Policy Implications

The present study examined the viability of and contributing factors to long-term education savings practices among individuals and families who have to budget for current and future education expenses. In particular, we assessed whether and how various forms of income (i.e., cash transfers, wages, and agrarian income) and access to formal savings services predicted the likelihood of saving

for educational purposes. The results strongly indicate that access to formal savings services—particularly ownership of a savings account—may be more predictive of this likelihood than the receipt of income, whether through government cash transfers, salaries and wages, or agrarian income. In light of this finding and congruent with results from other empirical studies (Chowa et al., 2012a; Johnson et al., 2018; Lee et al., 2017), policymakers should prioritize efforts to expand access to formal savings services, as this will likely generate a high positive impact on families' saving behaviors regarding future education expenses.

We know from existing studies that income is predictive of private saving decisions (Grigoli et al., 2018). Yet, evidence from the present study suggests that the relationship between income and education savings decisions, while often positive, is less significant than the relationship between savings account ownership and education savings behavior. Thus, expanding access to formal savings services could have the additional benefit of helping families prepare financially for education expenses. Opt-out policies that encourage working parents to dedicate a small portion of their social security contributions and government social transfers towards their children's education might encourage families to start financial planning for post-secondary education. Additionally, it may be prudent for financial institutions to develop and implement financial training and mentorship programs that help parents set long-term financial goals regarding education financing. In short, although certain forms of income do increase the likelihood of saving for education, this likelihood is strongly amplified when a formal savings account exists specifically for education savings.

One of the practical ways to increase access to savings accounts is to link social protection programs (e.g., cash transfers) to recipients' savings accounts, thereby encouraging the most vulnerable populations to have these accounts. Indeed, the present study found that the relationship between receiving cash transfers (i.e., government assistance) and the probability of preparing financially for future education, although not statistically significant, trended in a positive direction. We found that most (56%) participants received cash transfers and had savings account to prepare financially for future education. On the other hand, among those who received cash transfers but did not have a savings account, most (56%) did not prepare financially for future education. Along with the positive trends in our multivariate models, these descriptive findings suggest that (a) receiving government cash transfers may not disincentivize financial preparation for future education, and (b) pairing cash transfers with savings account ownership may offer a promising strategy to help low-income families to more easily save for future education expenses. Because of data limitations, we could not differentiate between conditional and unconditional cash

transfers and their relationship to education savings account ownership. Browne (2013) explains that a primary reason for adding conditions to cash transfers is “to incentivise investment in mid- to long-term human capital accumulation” (p. 2). As new data become available, future studies should investigate the possible heterogeneity in the treatment effects of various forms of cash transfers on education saving behaviors.

Other findings of the present study raise policy and practice questions about whether efforts to encourage families to prepare financially for their children’s future education should focus exclusively on establishing savings accounts with formal financial institutions. Our results showed that 40% of respondents in the lowest income quintile saved for future education, which is consistent with earlier findings suggesting that even individuals at the lowest income levels can and do save (Azzolini et al., 2020; Chowa et al., 2012b; Schreiner & Sherraden, 2007). Notably, our results also show that a fair number of respondents who reported that they save for education and school expenses did not have formal savings accounts. The proportion of non-account owners who reported accumulating resources for education in non-cash forms (e.g., land and livestock) or through informal mechanisms was 46% in sub-Saharan Africa, 44% in low-income countries, and 42% in lower-middle-income countries. In other words, in most of the world’s poorest regions, a high proportion of people who do not have formal savings account still prepare financially for future education expenses. This finding is consistent with Ansong and Chowa’s (2010) study highlighting the utility of informal saving mechanisms in sub-Saharan African contexts.

The evidence that saving for education often occurs outside formal institutions, notwithstanding the growth in financial inclusion across lower- and lower-middle-income countries and especially in sub-Saharan Africa (Demirgüç-Kunt et al., 2018), suggests that additional measures are needed to promote asset accumulation. Innovative savings options that combine the benefits of formal saving with the convenience and accessibility of informal saving tools, including mobile money, may help promote asset building through formal saving mechanisms (Ansong et al., 2020). Given the proliferation of digital financial tools, mobile phone usage (GSM Association, 2020; Suri & Jack, 2016), and e-wallets in low-income economies, individuals can control their savings and withdraw money as needed (Allen et al., 2014; Mbiti & Weil, 2013). Still, in light of the added benefits of formal saving mechanisms compared to informal mechanisms [e.g., greater safety and positive interest rates (Chowa et al., 2014)], it remains unclear why a sizeable proportion of individuals who save for education and school fees do so outside the formal financial sector. More research is needed to clarify the reasons for the preference for informal saving mechanisms for education.

Conclusion

This study used data from 59 low and lower-middle-income countries to test two hypotheses: (1) that people with current income will be more likely to save for education than those without income, and (2) that people with formal saving tools will be more likely to save for education than those without formal saving tools. The data supported both hypotheses. These findings should be considered in light of their limitations. First, the relationship between ownership of savings accounts and the tendency to prepare financially for education could also be driven by reverse causality (i.e., the desire to save for education may cause someone to open up a formal savings account). In the absence of temporal data to confirm the causal direction of the relationship, readers should avoid making strong causal claims and instead consider this work as a descriptive study of patterns in education financing. Second, the binary nature of the outcome variable and the predictors of interest increases the risk of underestimation of how savings amount and income level explain future planning for education. Third, because of data limitations, this study has little information about the intra-household aspects of education financing, particularly in households where parents make decisions about saving and paying for education on behalf of their children. Future studies of education savings patterns should assess the interactions between income and access to savings services and relevant intra-household factors. Future Global Findex data should also include the savings for education variable. This variable was excluded from the 2017 Global Findex survey, yet it is important to know how people are preparing to finance education.

Notwithstanding these limitations, our study contributes essential insights into the differential utility of savings account ownership, vis-à-vis various income forms in helping families prepare financially for future educational needs. Access to income generally encourages families to prepare financially for education, and this effect may be amplified when these families employ formal savings services. As more of the burden of higher education financing falls on individuals and families, programs and policies must be adopted to assist families in planning long-term education investments.

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