Closing the Educational Gender Gap in Ethiopia: Perspectives from Behavioral Economics

Surya Kotapati '24

Abstract

Social planners in developing countries have sound reasons to focus on girls' educational attainment. It is well established, for instance, that the attrition of female students from an education system after primary schooling not only lowers their future earnings but also results in such spillover effects as diminished social mobility and worse public health outcomes. Recent work in behavioral economics has uncovered an explanation for why many developing countries systematically underinvest in girls' education: the interaction between bounded human rationality and prevailing social norms that subordinate girls' human capital development to that of boys. Taking up the case of Ethiopia, which exhibits one of the widest gender gaps in educational attainment globally, this paper advances a proposal to mitigate the differential attrition of female students toward the end of and after primary school. Present-biased parents likely systematically overvalue the immediate benefits of their children withdrawing from school relative to the increased future income from greater educational attainment, and prevailing social norms in Ethiopia amplify the effects of the present bias with respect to female students. This paper presents a two-pronged behavioral intervention to counter those effects. First, primary school-leaving girls should be enrolled by default in secondary school to harness the human tendency toward the status quo. Further, parents should be awarded conditional cash deposits that would be redeemable after their female children complete a given year of primary schooling, as opposed to an ex-ante cash transfer; loss aversion dictates that this would present a stronger incentive because a loss relative to a reference point is more painful than an equivalent gain is pleasurable.

Introduction

While more girls are entering school in Ethiopia than ever before, there is much progress to be made in keeping them there. In 2015, the gross primary and secondary school enrollment ratios[1] for female students in Ethiopia were 96.1% and 30.3%, respectively—and these metrics have remained consistently lower for girls than for boys (UNESCO Institute for Statistics 2020).

Since the early 1990s, Ethiopian policy makers have sought to address the gender disparity in educational attainment (Rose 2004). Female students largely leave school during the latter years of primary school and the intervening period between the end of primary school and the start of secondary school (York, Rose, and Pankhurst 2021; UNESCO 2009). This trend is particularly troubling in light of evidence showing that increasing girls' educational attainment bolsters future earnings and generates wider benefits to society, including better public health outcomes and more robust intergenerational mobility (King and Winthrop 2015). The challenge in Ethiopia, then, is to retain female students as they progress through upper primary school and in the period between the end of primary school and the start of secondary school.

This paper argues that Ethiopian parents' present bias, or tendency to care disproportionately about immediate outcomes, contributes significantly to the attrition of female students from the education system. Present-biased parents likely systematically overvalue the near-term benefits of their children withdrawing from school relative to the increased future income from greater educational attainment, and prevailing social

[1] Gross enrollment ratio is defined as the ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to the level of education.

norms in Ethiopia amplify the effects of the present bias with respect to female students.

To mitigate the effects of parents' myopic decision-making, primary school-leaving girls should be enrolled by default in secondary school to increase retention by harnessing parents' status quo bias. Moreover, at the start of each year of upper primary schooling, parents should be awarded conditional cash deposits redeemable after their female children complete the academic year. This would more strongly discourage parents from pulling girls out of upper primary school than a traditional cash transfer given the human tendency of loss aversion.

Background

The Ethiopian school system comprises eight years of primary education, divided into a four-year "lower" cycle and another four-year "upper" cycle, followed by four years of secondary education (Trines 2018). Due to prevailing social norms, Ethiopian families perceive the present benefits associated with dropping out of school to be higher for girls than for boys. For example, girls are far more likely to be expected to contribute to domestic work than boys are (King and Winthrop 2015), so families are more likely to benefit from greater domestic help if a girl drops out than if a boy does. Moreover, early marriage of girls, which is incompatible with school attendance (Raj et al. 2019), is highly prevalent in Ethiopia (Rose and Al-Samarrai 2001). Ethiopian families likely derive utility from their daughters conforming to this gender norm, as norms are often seen as signals of optimal decision-making, while failing to follow them typically elicits social sanctions. This utility makes the perceived present benefit of pulling a girl out of school greater than it is for boys.

Social norms also lead parents to perceive the future returns to keeping female children in school to be lower than they are for male children. Ethiopian society generally views men as more "competitive" and "brave" and thus more capable breadwinners than women, who are seen as "obedient" and "shy" (Emirie 2005). As a result, skilled employment opportunities continue to favor men in Ethiopia (Rose 2004), and the low participation of Ethiopian women in the skilled workforce has been demonstrated to compel more female students to drop out early from school (United Nations 2011). Thus, social norms and their labor market outcomes lead parents to view the future returns to education for girls as lower than they are for boys.

The education system's failure to retain female students likely has a significant negative impact on both their future earnings and the welfare of Ethiopian society as a whole. Mincer's Human Capital Function demonstrates that a premature end to schooling is likely to depress the future earnings of Ethiopian women in the workforce (Patrinos 2016). Indeed, the average private rate of return to workers' earnings for an additional year of primary schooling is 32.5%, and 19.2% for an additional year of secondary schooling in Ethiopia (Joshi and Verspoor 2013). Studies in similar policy contexts have shown that the returns to schooling do not differ significantly by gender (Deolalikar 1993). Educating women can also generate improvements across important dimensions of public health, resulting in lower infant mortality rates and higher rates of vaccination (King and Winthrop 2015). Finally, better-educated mothers are significantly more likely to invest heavily in their children's human capital; they are also likely to be highly salient role models for their children (Rose 2004). Accordingly, reducing gender inequality in education in Ethiopia has significant potential to boost women's earnings and generate wider benefits to society at large.

Theory

This paper argues that Ethiopian parents' present bias contributes significantly to the attrition of female students from the education system. The Family-Economy hypothesis posits that a parent's decision to continue their child's education depends on an analysis of the immediate and future benefits to the family (Morduch 2000). Ethiopian families deciding whether to withdraw their child from school weigh the present rewards of their child dropping out, such as the ability to enter the workforce or to tend to household duties, against the future benefits of their child continuing their education. Present-biased families likely overvalue the immediate benefits to their child dropping out relative to increased future earnings. Indeed, empirical work in a similar policy context has shown that families systematically overweight immediate benefits while discounting future rewards to education in a quasi-hyperbolic manner (Lichand and Thibaud 2022).

Standard economic models assume that individuals rationally discount future rewards exponentially by the

factor δ, where $0 \leq \delta \leq 1$, in a time-consistent manner. By contrast, behavioral economists argue that the discount factor grows smaller the farther the rewards are projected into the future. In this case, Ethiopian families deciding whether to keep their children in school discount the perceived utility from leaving school at all future dates by an additional constant factor β, where $0 \leq \beta \leq 1$, which reflects their disproportionate emphasis on the present benefits of leaving school. The following equation represents the perceived utility function U_t for these families:

$$U_t = u_t + \beta\delta u_{t+1} + \beta\delta^2 u_{t+2} + \beta\delta^3 u_{t+3} + \ldots$$

Present bias might be particularly relevant in this context because the period to enroll a student for the next year of school is between July and September, immediately preceding the time of Ethiopia's main harvest (United States Department of Agriculture 2008; Trines 2018; Rose and Al-Samarrai 2001). Most Ethiopian parents are engaged in agrarian work (International Monetary Fund 2008), and preharvest financial pressures have been shown to increase the cognitive loads on farmers (Mani et al. 2013). Greater cognitive loads increase present bias (Shiv and Fedorikhin 1999), and thus lower the likelihood of long-term investments in human capital during such times.

Accordingly, present-biased Ethiopian parents are more likely to pull their children, regardless of their gender, out of school at earlier stages than if they were perfectly rational actors. However, as established in the previous section, the prevailing social norms in Ethiopia lead parents to perceive a female student's future returns to education—or u_{t+1}, u_{t+2}, u_{t+3}, and so on—as lower than they are for male students, and the present benefits to dropping out—u_t—as higher than they are for male students. It follows that when families are deciding whether to pull their child out of school, they are more likely to perceive u_t as greater than u_{t+1}, u_{t+2}, and u_{t+3} for female students than for male students at any given t. Present bias is thus likely to result in dropouts at earlier stages for female students than male students in Ethiopia.

Suggested Behavioral Policy Solution

This paper argues for a two-pronged behavioral intervention to improve the retention of female students as they progress through the upper primary level and to raise the likelihood that female students continue from upper primary to secondary school. First, enrolling primary school-leaving girls in secondary school by default could increase secondary school enrollment by taking advantage of their parents' status quo bias. Girls completing their eighth, and final, year of primary school would automatically be enrolled in the secondary school for their area. The public education system in Ethiopia operates in a similar manner to America's school district system in terms of geographics, so there is a natural location fit for every student (Aschale 2017). Ethiopian parents' choices would be biased toward the status quo, or automatic secondary school enrollment, as it is laborious for people to make the active choice to opt out of the default (Ghesla et al. 2019). Traditional economic models predict that defaults have little to no impact on outcomes—decision makers would just opt out of any default that is inconsistent with their preferences. In reality, however, defaults significantly impact decision-making because individuals are biased toward the status quo. This is true even in highly consequential decision contexts, such as education (Madrian 2014).

A default would be particularly suited to mitigate the effects of present bias in this policy context because Ethiopian parents likely experience high cognitive load during the period of enrollment, as discussed earlier. In short, a default would cause Ethiopian families to be less likely to withdraw their daughters from the schooling system before secondary school because it is simply more inconvenient to do so. Convenience is especially relevant during the time of low mental bandwidth that coincides with the enrollment period.

Our policy intervention must also address the high dropout rates of female students toward the end of primary school. Girls' progress through upper primary schooling can be incentivized by awarding their families conditional cash deposits of $50 that are only redeemable upon completion of each year. If a girl were to begin her fifth year of primary school and drop out before finishing it, the cash deposit of $50 would no longer be available to her family. If a girl misses school on a regular basis, her family would be notified via text message about the deposit they could lose, making the loss frame salient. A $50 deposit would represent a significant incentive for families to ensure that their daughters progress through upper primary school, given that the per capita income

of Ethiopia is $890 (World Bank 2021). This amount is comparable to that used in a successful cash transfer program in Malawi (Baird et al. 2011). Moreover, the Ethiopian government spent about $193 educating each pupil in 2018 (Education Policy and Data Center 2019), and a $50 per year payment to less than 50% of all pupils would represent a 12.95% increase in expenditure at most. Given its potential for outsized benefits to overall social welfare, this increase in expenditure could be funded by a World Bank Institutional Development Fund (IDF) grant, which Ethiopia has been awarded in the past for other women's development initiatives (World Bank 1999).

Under traditional economic models, this prong of the policy proposal would have an identical effect as a conditional cash transfer (CCT) program that simply awards a cash deposit to a family after their daughter completes a year of education. Behavioral economics refutes that argument: in reality, families are "reference dependent," and their point of reference for a traditional CCT would be the state of the world where they do not yet have $50, while their point of reference in our intervention would be the state of the world where they already have $50. To families participating in a traditional CCT program, the prospect of being awarded the $50 deposit would represent a relative "gain" since they do not have it yet. Meanwhile, families receiving the proposed intervention would view the prospect of not being able to redeem the $50 deposit as a relative "loss" given that they already "have" it in this frame. Prospect Theory posits that people are loss averse— a given loss is more painful to them than an equivalent gain is pleasurable—so the potential $50 "loss" in our proposed solution would be more painful to families than the potential $50 "gain" from traditional CCTs would be pleasurable (Kahneman and Tversky 1979). Therefore, the second prong of our solution would more strongly incentivize Ethiopian families to ensure that their daughters progress through upper primary schooling than traditional CCTs would.

Conclusion

Increasing the number of years girls spend in school can bolster future incomes, have outsized effects on key public health indicators, and generate positive human capital spillover effects. However, parents' present bias likely leads to early dropouts, and female students feel this effect at earlier stages than male students given Ethiopia's unique sociocultural context. The Ethiopian government must retain female students as they progress through upper primary school and in the period between the end of primary school and the start of secondary school. Enrolling primary school-leaving girls in secondary school by default and awarding parents $50 cash deposits that would only be redeemable upon their children completing each year of upper primary schooling would address this disparity. A difference-in-differences study conducted on a sample of upper primary schools in the same region of Ethiopia would be a feasible method of determining this intervention's causal effects. These design elements have the potential to greatly improve the efficacy of conditional cash transfer programs used to boost critical drivers of human development in similar cultural and socioeconomic contexts.

Acknowledgements

This article was adapted from a policy proposal originally written for ECON 233: Behavioral Economics and Public Policy, taught by Professor Matthew Chao.

References

Aschale, Tagele Mossie. 2017. "Assessment of Schools Spatial Distribution and Identifying Suitable Areas by Using GIS Technology: In Case of Debre Markos Town North Western Ethiopia." Journal of Resources Development and Management 35.

Baird, Sarah, Craig McIntosh, and Berk Özler. 2011. "Cash or Condition? Evidence from a Cash Transfer Experiment." The Quarterly Journal of Economics 126(4): 1709–53. https://doi.org/10.1093/qje/qjr032.

Deolalikar, Anil B. 1993. "Gender Differences in the Returns to Schooling and in School Enrollment Rates in Indonesia." The Journal of Human Resources 28(4): 899. https://doi.org/10.2307/146297.

Education Policy and Data Center. 2019. "National Education Profile 2018 Update." https://www.epdc.org/sites/default/files/documents/EPDC_NEP_2018_Ethiopia.pdf.

Emirie, Guday. 2005. "Early Marriage and Its Effects on Girls' Education in Rural Ethiopia: the Case of Mecha Woreda in West Gojjam, North-Western Ethiopia." Dissertation, University of Gottingen.

Ghesla, Claus, Manuel Grieder, and Jan Schmitz. 2019. "Nudge for Good? Choice Defaults and Spillover Effects." Frontiers in Psychology 10. https://doi.org/10.3389/fpsyg.2019.00178.

Herath, Subhangi. 2011. Rep. Women's Access to Decent Work. New York, New York: United Nations Commission on the Status of Women.

Hodal, Kate. 2017. "Revealed: the 10 Worst Countries for Girls to Get an Education." The Guardian, October 11, 2017. https://www.theguardian.com/global-development/2017/oct/11/revealed-the-10-worst-countries-for-girls-to-get-an-education-international-day-girl

International Monetary Fund. 2014. "The Federal Democratic Republic of Ethiopia: Selected Issues Paper." IMF Staff Country Reports 14(304). https://doi.org/10.5089/9781498335294.002.

Joshi, Rajendra, and Adriaan Verspoor. 2013. "Secondary Education in Ethiopia: Supporting Growth and Transformation." World Bank. https://doi.org/10.1596/978-0-8213-9727-5.

Kahneman, Daniel, and Amos Tversky. 1979. "On the Interpretation of Intuitive Probability: A Reply to Jonathan Cohen." Cognition 7(4): 409–11. https://doi.org/10.1016/00100277(79)90024-6.

King, Elizabeth M., and Rebecca Winthrop. 2015. Working paper. Today's Challenges for Girls' Education. Washington, DC: Brookings Institution.

Lichand, Guilherme, and Juliette Thibaud. 2022. "Parent-bias." University of Zurich, Department of Economics, Working Paper No. 369, November 2020, https://dx.doi.org/10.2139/ssrn.3737685

Madrian, Brigitte C. 2014. "Applying Insights from Behavioral Economics to Policy Design." Annual Review of Economics 6(1): 663–88. https://doi.org/10.1146/annureveconomics-080213-041033.

Mani, Anandi, Sendhil Mullainathan, Eldar Shafir, and Jiaying Zhao. 2013. "Poverty Impedes Cognitive Function." Science 341(6149): 976–80. https://doi.org/10.1126/science.1238041.

Morduch, J. 2000. "Sibling rivalry in Africa." The American Economic Review, 90(2): 405– 409.

Patrinos, Harry. 2016. "Estimating the Return to Schooling Using the Mincer Equation." IZA World of Labor. https://doi.org/10.15185/izawol.278.

Raj, Anita, Marissa Salazar, Emma C. Jackson, Natalie Wyss, Katherine A. McClendon, Aarushi Khanna, Yemeserach Belayneh, and Lotus McDougal. 2019. "Students and Brides: a Qualitative Analysis of the Relationship between Girls' Education and Early Marriage in Ethiopia and India." BMC Public Health 19(1). https://doi.org/10.1186/s12889018-6340-6.

Rose, Pauline. 2004. Rep. Can Gender Equality in Education Be Attained? Evidence from Ethiopia. UNESCO Education for All Global Monitoring.

Rose, Pauline and Sameer Al-Samarrai. 2001. "Household Constraints on Schooling by Gender: Empirical Evidence from Ethiopia." Comparative Education Review 45(1): 36. https://doi.org/10.2307/1188874.

Shiv, Baba, and Alexander Fedorikhin. 1999. "Heart and Mind in Conflict: The Interplay of Affect and Cognition in Consumer Decision Making." Journal of Consumer Research 26(3): 278–92. https://doi.org/10.1086/209563.

Trines, Stefan. 2018. "Education in Ethiopia." World Education News and Reviews. Last modified November 15, 2018. https://wenr.wes.org/2018/11/education-in-ethiopia.

UNESCO. 2009. "Ethiopia." http://www.unesco.org/eri/cp/factsheets_ed/et_EDFactSheet.pdf.

UNESCO Institute for Statistics. 2020. "School Enrollment (% Gross) - Ethiopia." World Bank Group. Accessed May 23, 2021. https://data.worldbank.org/indicator/SE.SEC.NENR.MA?locations=ET.

United States Department of Agriculture. 2008. "Ethiopia 2008 Crop Assessment Travel Report". Accessed May 23, 2021. https://ipad.fas.usda.gov/highlights/2008/11/eth_25nov2008/.

World Bank. 1999. "Ethiopia: Women's Development Initiatives." https://documents1.worldbank.org/curated/en/780341468746346948/pdf/multi0page.pdf.

"Ethiopia: Overview." 2021. Accessed May 23, 2021. https://www.worldbank.org/en/country/ethiopia/overview#:~:text=With%20more%20than%2 0112%20million,per%20capita%20income%20of%20%24850.

Yorke, Louise, Pauline Rose, and Alula Pankhurst. 2021. "The Influence of Politics on Girls' Education in Ethiopia." In Reforming Education and Challenging Inequalities in Southern Contexts, edited by Pauline Rose, Madeleine Arnot, Roger Jeffrey, and Nidhi Singal. 98–119. Taylor & Francis. https://doi.org/10.4324/9780429293467-7.