Junior high school students' use of their afterschool hours in Ghana: The role of household assets

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ABSTRACT

Studies have examined a broad range of factors for how students use their time, but few attempts have been made to explore the nuanced link between different types of asset ownership and students' use of study time, particularly in resource-limited countries. This study uses data from junior high school students in Ghana to examine how students spend their time after school hours, the predictive influence of different types of household assets, and the extent to which these trends and relationships vary by gender. Polynomial quantile regression models were fitted across three quantiles (24th, 53rd, and 76th percentiles) to align with one hour, one and half hours, and two hours of study time. Results show that the average student spends well above the recommended 90 minutes on their schoolwork during afterschool hours, regardless of gender. Multivariate results indicate that owning limited assets tends to have a negative relationship with use of study time, but higher levels tend to be positively related to use of study time. Also, the predictive influence of asset ownership varies by asset type, and higher levels of asset ownership favor girls more than boys. Given this study's realtively small sample size, caution must be exercised in generalizing the study findings to the general population of junior high school students in Ghana. In light of the study's limitations, the finding of varying asset effect may have practical implications for asset development programs designed to enhance the well-being of low-income families.

Introduction

A growing body of evidence suggests that household assets are related to several domains of children's educational outcomes (e.g., academic performance, graduation, educational expectations; Chowa, Masa, Wretman, & Ansong, 2013; Greg, Jeanne, & Pamela, 1994; Grinstein-Weiss et al., 2013; Huang, 2013; Selcuk, 2005; Willingham, 2012). So far, in developing countries such as Ghana, this body of research has focused primarily on the psychological and achievement domains of

educational outcomes and less on the behavioral domain of educational outcomes. Very few studies have systematically examined the role of household assets on students' use of their afterschool time and study habits in Ghana. The purpose of this study is to examine the patterns of students' use of afterschool hours, and the extent to which household asset ownership predicts these patterns in Ghana. The study also examines whether gender moderates the relationship between assets and children's use of time.

It is important to understand how students use their afterschool time, because the period during afterschool hours can be the riskiest part of the day for school-age children (Douglas & Conroy, 2007). How students use their afterschool time could have positive or adverse effects not only on their learning outcomes, but also on their socioemotional development (ability to initiate and to maintain friendships), and their physical development (health). As such, it is imperative for stakeholders such as policymakers, researchers, parents, and afterschool program managers to have a better understanding of how students use their free time outside of school and what predicts it. Such information can aid stakeholders as they prioritize economic and education policies and programs that maximize students' use of afterschool hours.

From an empirical perspective, there is need for more information regarding the dynamics of students' use of time during afterschool hours in the Ghanaian context. By focusing on the pattern of time use, the study could enrich education stakeholders' understanding of the length of time students spend studying outside normal school hours. Moreover, insights into the potential connection of household assets to students' use of study time will add to the current literature concerning educational disparities along economic lines in developing countries such as Ghana. Such insights could inform interventions and strategies on how parents monitor and cultivate healthy habits on use of study time for their children. Together with emerging studies on students' time use, this study could also have implications for consideration of family-friendly workplace policies that make it possible for staff to more easily balance work and family obligations in Ghana.

Understanding the dynamics of students' use of time

More than ever, children around the world are saddled with competing demands for their afterschool hours. These demands range from engagement in recreational and economic activities to enrollment in supplemental learning, such as extra classes (Cooper, Robinson, & Patall, 2006; Warton, 2001). Children in many resource-limited countries may not be too different in their use of time, except that their allocation of afterschool hours to economic activities may be more pronounced compared to children from other parts of the world (Dar, Blunch, Kim, & Sasaki, 2002). For instance, in some African contexts, many children in their early teens devote a significant amount of time to child work and child labor (International Labor Organization, 2015). About 28% of Ghanaian children are involved in some form of child labor (Canagaragah & Coulombe, 1997; Ghana Statistical Service, 2013). There is a relationship between children's engagement in child labor and their school participation and attendance (Canagaragah & Coulombe, 1997).

In child development literature, two reasons tend to drive children's devotion of time to economic activities. Household poverty is often cited as the primary reason that some children spend a significant amount of their time on economic activities (Blunch & Verner, 2000; Duryea, 2003). According to the Ghana Child Labor Survey Report, many children who work are reported to be working to raise money for their schooling (Ghana Statistical Service, 2003). Some families rely on the income from children's economic activities to supplement the families' financial resources (Bass, 2004). Other families link children's use of time to unpaid work and domestic chores to issues of socialization (Bhukuth, 2008). For those families, engaging children in work, whether for economic or noneconomic purposes, is an important rite that affords the child opportunities to receive cultural training and traditional education.

Notwithstanding the rationalization of children's use of time for work and socialization, there continues to be a shift in how many parents engage their children during afterschool hours. Over the last decade, the phenomenon of extra classes after regular school hours has grown steadily in many developing countries. A global survey, including developing countries such as Kenya, Nigeria, Mauritius, and Tanzania, shows that 25% to 90% of students receive afterschool supplemental tutoring, regardless of grade level (Dang & Rogers, 2008). Ghana, the geographical focus of this article, has one of the highest participation rates in private afterschool tutoring in math. However, research has indicated that diversion of children's afterschool leisure time to more academic work may have negative implications for children's psychosocial and physical development (Irby & Tolman, 2002; Opić & Duranovića, 2014; Piko & Vazsonyi, 2004). Douglas and Conroy (2007) reported in their study that evidence-based afterschool programs incorporate sports and other physical activities into their programs to ensure positive development of the child both academically and socially.

Despite the implications of substituting children's leisure activities during afterschool hours with more academic activities, the practice of enrolling children in supplemental tutoring is gaining popularity because more time on schoolwork may have implications in the short and long-term. Although spending excessive amounts of time on schoolwork can lead to unintended negative consequences (Stinebrickner & Stinebrickner, 2004), a large body of empirical evidence has suggested that children's devotion of time to their learning is a significant positive factor in their academic performance (Al-Ansari, 2005; Brint & Cantwell, 2010; Duncan & Murnane, 2011; McKenzie & Gow, 2004). In the short to medium term, students' ability to do well on a test partly depends on their devotion of sufficient time to achieve study goals. A study by Verma, Sharma, and Larson (2002) showed that students who do not spend time on their schoolwork experience heightened academic anxiety.

Educators and experts on youth development have advocated for a balance between academic and nonacademic work during afterschool hours (Halpern, 2002). There are long-term benefits to learning time management strategies and cultivating appropriate study habits early, including success at work (MacKenzie

& Nickerson, 2009) and job satisfaction (Claessens, Eerde, & Rutte, 2007). Furthermore, it is reasonable to expect that parents will let their children spend some of their afterschool hours completing homework but also create time for them to engage in nonacademic activities. However, do parents and children conform to such best practices, particularly in rural communities where there is a greater chance for children to spend more time on farms? This study aims, in part, to understand how students from low-income backgrounds devote their afterschool time to their academic work.

Theorization of asset effects on adolescents' use of time

A variety of underlying factors, including gender, academic achievement, and household social and economic characteristics predict the length of time students devote to their learning versus play (Xu et al., 2014; Zhang, Karabenick, Maruno, & Lauermann, 2011). In this study, we explore the ownership of household assets as a key predictor of students' choices around how they spend their time.

Per the luxury axiom (Bandara, Dehejia, & Lavie-Rouse, 2015), households might allow their children to engage in work or other economic activities when the household experiences income shocks that affect their ability to make ends meet. Empirical studies have shown that contributions from children make up a third of the income in some families (Patrinos & Psacharopolous, 1994). The question then arises: Do the type and level of assets available to the household change the dynamics of children's use of time during afterschool hours? As the permanent income hypothesis suggests, available household assets can buffer the income shocks. In other words, having assets might level the household consumption of goods and mitigate the urge for some households to rely on supplemental income from children's work or economic activities during afterschool hours. The greater the number of assets individuals have, the more likely such assets will sufficiently fill the consumption deficits created by the income shocks (Bandara, Dehejia, & Lavie-Rouse, 2015). Thus, we hypothesize a dynamic relationship between asset holding and children's use of time during afterschool hours. Having fewer assets will have a negative relationship with a child's use of time during afterschool hours (per the luxury axiom) but as the household assets increase, the relationship will turn positive because at that point, household assets meet household consumption demands.

We also hypothesize that the length of time students spend on their schoolwork during afterschool hours will vary by the type of household assets because the mitigating role of asset ownership during irregular income flows may be more pronounced when the household assets are fungible. Research from Sub-Saharan Africa (SSA) suggests that because livestock are a flexible and fungible asset for households in arid and semi-arid areas, having such assets helps to absorb shocks created by income fluctuations (World Resources Institute, 2005). Chowa, Ansong, and Masa's (2010) extensive research review of asset effects in developing countries substantiates that assets, in general, may be linked to children's use of study time, but the type of assets owned may have differential effects.

Evidence on household assets and educational outcomes

Besides the theoretical justification, there is an empirical basis for the expectation of a heterogeneous relationship between owning assets and students' use of time. Evidence from existing literature about the mixed relationship between assets and education-related outcomes suggests a nuanced association between assets and students' use of time. Assets can have adverse effects on education-related outcomes in SSA especially when the assets require a significant amount of time to manage. Studies have found that ownership of assets such as land is associated with a reduction in the probability of school attendance in Zambia (Jensen & Nielson, 1997) and a higher risk of child labor in Kenya (Buchmann, 2000). Similarly, ownership of assets such as cash crops is associated with a decrease in school attendance rate and an increase in the amount of time boys spend maintaining the assets (Cockburn & Dostie, 2007). Because maintaining cash crops and raising livestock entail significant time and effort, some families rely on their children to help plant and harvest crops and herd livestock. Thus, engaging children in the accumulation and management of agriculture-based assets may keep children from studying after school.

It is worth noting that not all agricultural-based assets have adverse effects on children's education because other studies have found positive associations between asset ownership and school enrollment and attendance in most developing countries (Filmer & Pritchett, 1999, 2001; Montgomery, Grant, Mensch, & Roushdy, 2005; Montgomery & Hewett, 2005). Cockburn and Dostie (2007) also found that ownership of farm equipment such as plows and sickles increased school attendance. Perhaps, certain types of assets consume children's time more than others and that those assets that replace children's labor allow children to spend more time on their school work. The question is whether the relationship between household assets and the length of time students devote to their schoolwork varies by the type of asset. This study addresses this question by comparing the predictive role of household ownership of livestock versus other forms of productive assets.

Based on the foregoing findings about the nuanced associations between certain types of assets and education-related outcomes, we hypothesize a dynamic nonlinear relationship between assets and time use, whereby the direction is not constant. This fluid relationship reflects two possibilities. First, owning few or no assets has a negative asset effect because a family may not have enough resources to cover most school needs, but the relationship becomes positive as the family begins to own more assets. The second possible explanation is that parents may rely on children's labor when there are fewer assets, but as asset levels rise, parents may resort to external labor, thus, relieving children to focus on their schoolwork.

This study also examines whether gender moderates the relationship between assets and children's use of time. Gender differences in education-related outcomes continue to attract considerable attention in education research because of known gender differences in how families invest in their children's education. Culture norms and expectations drive gender disparities in educational

investment and such disparities often reflect in inequalities in outcomes. Bhalotra and Heady (2003) found that the relationship between ownership of farmland and school attendance in Ghana is much stronger for girls than for boys. Ravallion and Wodon (2000) also found similar gender differential results in Bangladesh. Given these gender differences in the effect of household assets, the question is whether the role of household assets on students' time use, if any, would be similar for boys and girls. Empirical evidence suggests that girls devote less time to their studies in comparison to boys (Niradhar, 2008). While such gender disparities in students' use of time may be connected to assets that households own, research has yet to clarify if that is the case among junior high school students in Ghana.

In sum, this study addresses three specific research questions: (a) What are the patterns of students' time allocation to their schoolwork during afterschool hours? (b) What is the nature of the relationship between household assets and the length of time students devote to their schoolwork? and (c) Does the relationship between assets and time use, if any, vary by the type of assets and the gender of the student? In addressing these questions, this study took into account other factors that research suggests have a higher probability of influencing the outcome variable, predictors, or the relationship between them.

Covariates of household assets and student's time use

Geographic variations and indicators of economic well-being are known to directly predict how people invest their time in afterschool activities such as extra classes in both developed and developing countries (Buchmann, 2002; Davies, 2004; Wang, 2014). For example, the agriculture-based economy of rural areas coupled with the low-income status of many rural dwellers means there is a high probability that children living in low income households in rural areas would assist with farm work, especially during off-school days and afterschool hours. To that end, this study accounts for the geographical residence of participants. In the absence of income measures, the study also uses participants' perception of their household's ability to pay for schooling as a proxy for household income. Previous research has also acknowledged that homework assignment is one of the activities that occupies children's after school time. In Ghana, one of the primary means by which many parents engage with their children during afterschool hours is helping their children complete their homework (Chowa, Ansong, & Osei-Akoto, 2012; Nyarko, 2011). Similarly, teachers can have an influential role in children's enthusiasm about their schooling, including how they use their afterschool time. Research shows that teacher support motivates students to engage more with their school work (Martin, 2006). This study also accounted for household structure by controlling for whether the household was headed by a male or female. Ample research suggest that households headed by females are more vulnerable to being asset poor often because of limited social connectedness and discriminatory practices (International Fund for Agricultural Development, 2017; Schmidt & Sevak, 2006).

Table 1. Descriptive statistics.

Variable	Mean or %	SD	Min	Max	Skewness	Kurtosis	Quantile 25%	50%	75%>
Outcome variable									
Allocation of afterschool hours	135.4	64.93	10	340	1.090	3.957	90	120	155
Predictors of interest									
Household possessions index	1.760	1.585	0	5.917	0.855	2.720	0.307	1.027	2.626
Livestock index	16.47	5.073	6.876	22.57	−0.002	1.632	11.76	15.08	22.57
Student-level covariates									
Homework habit	6.193	1.647	0	9	−0.410	4.358	5	6	7
Exam score	337.8	106	142	586	0.336	2.699	276	327.5	400.5
Age	15.89	1.780	12	23	1.115	5.170	15	16	17
Girls[+]	55.9%								
Works for money[++]	19.85%								
Household-level covariates									
Homework support	2.865	1.443	1	5	0.092	1.893	1	3	4
Has money for school	2.685	0.904	1	5	−0.672	3.643	3	3	3
Female head[+++]	39.6%								
School-level covariates									
Teacher support	4.477	0.672	2	5	−1.271	4.764	4	5	5
Rural community[++++]	62.2%								

Note. Reference groups: [+]boys, [++]does not work for money, [+++]male head, [++++]urban community.

Methods

Data and study design

Data were drawn from the baseline survey of a 2014 pilot research project in Ghana that tested the relationship of financial support to students' psychosocial and academic outcomes. Study participants were final-year junior high school students from three schools in two administrative districts in Ghana: The Ashaiman and Dangme West districts. The valid sample was 135 students, but the analytical sample reduced to 119. Respondents were dropped if they had missing data on both the dependent variable and the variable of interest, or they indicated that they spend at least eight hours a day on their schoolwork. Eight hours on schoolwork was considered extreme and impractical. Table 1 presents the demographic characteristics of the analysis sample.

Measures

Outcome variable

Allocation of afterschool hours was the outcome variable and was measured in minutes. This continuous variable was a self-report of the amount of time students spent on their schoolwork every day outside normal school hours. Respondents were asked, "On the average, how much time a day do you spend on schoolwork after normal school hours?" Respondents provided their responses in hours or minutes, but the responses were converted into minutes to ensure consistency.

Predictors of interest

We focused on two asset constructs—property ownership and livestock ownership—as the variables of interest. The original asset variables measured

respondents' binary (yes/no) response on the question of whether their households own five types of properties (land, house, vehicle, canoe, and bicycle/motorbike) and five types of livestock (cattle, goat, sheep, pig, and poultry). We used categorical principal component analysis (CPCA), a data reduction technique for categorical data, to create two asset indexes—property index and livestock index (Linting, Meulman, Groenen, & Van der Kooij, 2007). A clear elbow in a scree plot and eigenvalues ≥ 1 were used as the criteria to determine the number of principal components to retain. Both criteria suggest a two-component solution. The two components explained 89% of the variance and had eigenvalues of 3.42 and 1.42. After creating the weights through CPCA, we used the approach that Filmer and Scott (2008) and Filmer and Pritchett (2001) recommended to compute the property and livestock asset indexes.

We used the object scores as weights for index by first subtracting each asset variable from its mean, dividing the result by the standard deviation of the same variable and multiplying the results by the variable weight obtained from the CPCA. Results for the property variables were summed to form the property index. Likewise, results for all livestock variables were summed to form the livestock index. The property index was normally distributed with skewness of 0.855 and kurtosis of 2.720. The livestock index also had a skewness value of –0.002 and kurtosis of 1.632.

Student-level covariates

Exam score captured respondents' performance in mathematics, English, science, and social studies at the end of their academic term. *Homework habit* was a single item that asked respondents to indicate how often they turned in completed homework on time. Responses ranged from 1 (*seldom*) to 5 (*sometimes*), to 9 (*always*). Respondents' *age,* a continuous covariate, was measured in years. *Girls* was a binary measure indicating whether a respondent was a girl (coded as 1) or a boy (coded as 0). *Work for money* was a binary covariate, which measured whether respondents engaged in activities for economic benefits. Respondents were categorized as *working for money* if they indicated that they get money by selling things or from work that they did for pay.

Household-level covariates

Has money for school was a self-report measure of whether respondents thought their families had enough financial resources to pay for their school expenses. The variable was measured on a 5-point response scale ranging from 1 (*never*) to 5 (*always*). *Homework support* was measured with a single item asking respondents to indicate how often their parents helped with their homework, using a 5-point scale ranging from 1 (*never*) and 5 (*always*). *Female head*, a binary indicator, accounted for whether a respondent lived in a household headed by a female (coded as 1) or a male (coded as 0).

*School-level covariates***:** *Teacher support* was measured with a single item asking students to use a 5-point reponse scale 1 (*strongly disagree*) to 5 (*strongly agree*) to indicate their agreement with the statement, "when I need extra help, I can get it."

Rural community was a binary measure of whether the respondent attended school in a rural area, coded as (*1*), or an urban area, coded as (*0*).

Data analysis

We used two univariate inferential tests—one sample *t* test and chi-square goodness-of-fit test—to examine the nature of students' study time during afterschool hours. We conducted a one-sample *t* test to examine whether the amount of time students devoted to their schoolwork was significantly different from the average of 64.54 minutes for the typical junior high school student in Ghana (Ansong, 2013; Chowa et al., 2015) and 90 minutes for ninth-graders, based on the well-known rule of thumb: the 10-minute rule. The 10-minute rule recommends 10 minutes of homework for each grade level, and is recommended by the National Education Association and the National Parent-Teacher Association (Cooper, 2007; Pressman et al., 2015). By this standard, ninth-graders in this study were expected to study for about 90 minutes.

We used polynomial quantile regression to simultaneously model the relationship between asset ownership (i.e., household properties and livestock) and students' study time, and the moderating role of gender. By using quantile regression, we acknowledge that the relationship between household assets and afterschool study hours is not necessarily constant as discussed in the review of the literature. In other words, the nature, direction, and strength of the relationship is expected to vary across the distribution of afterschool time (Cook & Manning, 2013). We fitted quantile regression models across three quantiles: 24th, 53rd, and 76th percentiles. These three quantiles were chosen because based on the two univariate inferential tests, the three quantiles align with the proportion of students who study after school for at least one hour (24th percentile), one and a half hours (50th percentile), and two hour*s* (75th percentile). We used this analytical strategy with three quintile cutoffs (with 30-minute increments) because of the interest in the conditional effect of asset ownership across the distribution of study hours. We used the parzen density function with a Chamberlain's bandwidth to estimate the standard errors of the quantile regression because of their efficiency and simplicity in minimizing the mean squared errors (Andriansyah & Messinis, 2014).

In all models, the two asset variables were initially specified as quadratic terms to reflect our hypotheses that the influence of assets on students' study time was heterogeneous at different asset levels. Following best practices, we dropped quadratic terms that were not statistically significant at the 0.05 significance level. We mean-centered the asset variables that were used to create quadratic and interaction terms to address potential multicollinearity problems and assist interpretation of coefficients. We also used the *testparm* and *test* syntaxes in Stata to examine the postestimation hypothesis that the coefficients of the economic-related variables (i.e., livestock, properties, money for school, and work for money) are equal.

Based on evidence from existing literature, we adjusted for 10 covariates. Specifically, we controlled for five student-level covariates (students' homework habits,

academic performance, age, gender, and engagement in income-generating activities). We also accounted for three household-level covariates (gender of head of household, household's perceived financial obstacle in paying for children's school, and parents' support regarding homework) and two school-level factors (teacher support and school status as rural vs. urban). We examined the potential role of gender as a moderator by specifying interaction terms for gender and each of the two asset variables. Programming for the polynomial quintile regression was implemented with the *qreg* syntax in Stata version 14. We specified the polynomial quantile regression as follows:

$$
\begin{aligned}
Q_{time}(\tau)_i \\
= \beta_0(\tau) + \beta_1(\tau)Properties_i + \beta_2(\tau)Properties_i^2 + \beta_3(\tau)Livestock_i \\
+ \beta_4(\tau)Livestock_i^2 + \beta_5(\tau)Homework\ habit_i + \beta_6(\tau)Exam_i \\
+ \beta_7(\tau)Age_i + \beta_8(\tau)Girls_i + \beta_9(\tau)Work_i + \beta_{10}(\tau)Homework\ support_i \\
+ \beta_{11}(\tau)Money\ for\ school_i + \beta_{12}(\tau)Female\ head_i + \beta_{13}(\tau)Teacher\ support_i \\
+ \beta_{14}(\tau)Rural_i + \beta_{15}()Girls^*livestock_i + \beta_{16}(\tau)Girls^*livestock_i^2 \\
+ \beta_{17}(\tau)Girls^*properties_i + \beta_{18}(\tau)Girls^*properties_i^2
\end{aligned}
$$

In the model, all the regression coefficients are indexed by τ, where τ of .25, .50, and .75 correspond to one hour, one and a half hours, and two hours of study time, respectively. *Qtime* (τ) denotes quantiles of student time use afterschool hours.

Results

Descriptive results

As presented in Table 1, the average amount of time students in the sample devoted to schoolwork during afterschool hours was 135 minutes ($SD = 64.93$). Results also showed that 25% of the sample spent at least 90 minutes on schoolwork, 50% spent at least 120 minutes, and 75% spent at least 155 minutes on schoolwork during afterschool hours. The average age of respondents was 16 years ($SD = 1.78$); most respondents were girls (56%) and lived in a rural area (62%). About a fifth of the sample (19.85%) engaged in some form of work or other economic activity. Only 39.6% of respondents lived in a female-headed household.

On average, respondents reported that their parents sometimes helped with their homework ($M = 2.865$, $SD = 1.443$). Respondents' mean exam score was ($M = 337.8$, $SD = 106$). The household property index ranged from 0 to 5.917, with a mean of 1.76. The livestock index had a wider variability, ranging from 6.876 to 22.570, with a mean of 16.47. That is, on the whole, livestock ownership was more common compared to the ownership of other types of assets. On average, students had a favorable view of their teachers' level support ($M = 4.477$, $SD = 0.672$, range $= 1$ to 5). The mean homework habit score was 6.193 ($SD = 1.647$), with a range of 0 to 9.

Allocation of afterschool hours pattern

Respondents devoted an average of 135.35 minutes of their afterschool hours to their schoolwork every day ($SD = 64.93$). The one-sample t test results showed a statistically significant difference between the sample mean and the estimated population mean of 64.54 minutes found in prior studies in Ghana (Ansong, 2013; $t = 11.49$, $p < .001$) or the 90-minute standard recommended by the National Education Association and the National Parent–Teacher Association (Pressman, et al., 2015; Vatterott, 2009; $t = 7.36$, $p < .001$). Thus, students in this study devoted more time to their schoolwork, well above the standard for ninth graders. However, the large standard deviation (64.93) and low minimum value (10 minutes) suggests that some students spent well below the recommended standard time. About 86% of the sample met the 90-minute standard, and results of the chi-square goodness-of-fit confirmed that this proportion is statistically significantly more than half of the sample (χ^2 goodness-of-fit $= 59.11$, $p < .001$).

Results revealed only marginal gender differences in use of time. Girls ($M = 128.97$, $SD = 60.55$) devoted 14.46 minutes less time to schoolwork compared to boys ($M = 143.43$, $SD = 69.86$), although the difference was not statistically significant ($t = 1.17$, $p = .12$). As illustrated in Figure 1, the study time distribution for boys and girls was fairly similar except that the boys' distribution had a slightly wider spread. Of the 86% of the sample that met the 90-min standard, 43.75% were girls and 56.25% were boys, but the difference was not statistically significant ($x2 = .045$, $p = .832$). Using the .05 significance level, multivariate results from the quantile regression models confirmed that students' study time did not vary by gender.

Multivariate results

Table 2 illustrates results of the polynomial quantile regression for the 25th, 50th, and 75th percentiles. At the 25th percentile of allotted student study time, both
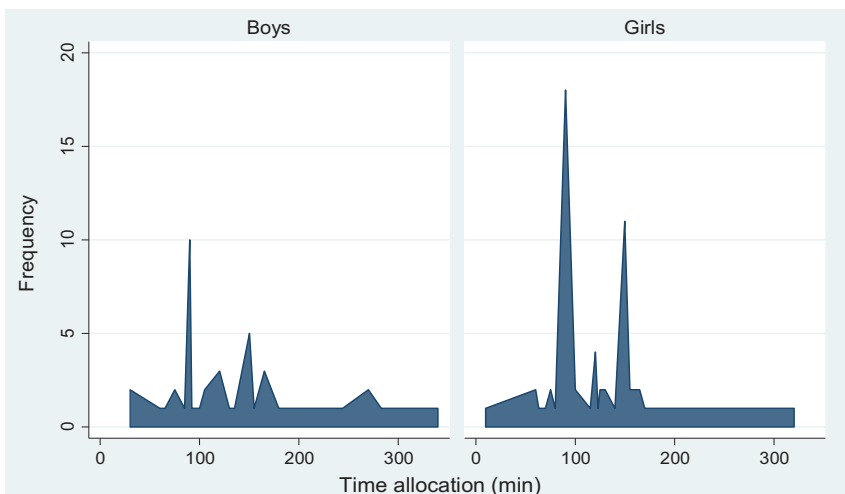

Figure 1. Student study time by gender.

Table 2. Multivariate results.

Variable	OLS model b (SE)	25th percentile b (SE)	50th percentile b (SE)	75th percentile b (SE)
Predictor				
Livestock (centered)	−0.173 (2.78)	−1.997* (0.85)	−3.884*** (0.99)	0.685 (1.79)
Livestock^2 (centered)			0.393* (0.19)	
Properties (centered)	−6.028 (6.46)	−16.850*** (3.62)	−21.409*** (4.19)	−8.710 (5.01)
Properties^2 (centered)		5.795*** (1.29)	4.535** (1.59)	
Covariate				
Age (years)	2.332 (3.52)	−1.371 (1.51)	−0.223 (1.72)	−0.573 (3.22)
Mother head	−13.100 (12.18)	13.310* (5.25)	−14.644* (6.00)	−23.047* (11.21)
Has money for school	9.326 (8.03)	12.649*** (2.98)	−4.932 (3.42)	15.874* (6.53)
Teacher involvement	1.198 (11.59)	−3.057 (4.52)	7.987 (5.20)	22.818* (9.83)
Parent homework support	4.393 (4.41)	−0.711 (1.77)	0.199 (2.02)	3.134 (3.86)
Homework habit	6.402 (5.08)	1.473 (1.65)	8.380*** (1.89)	7.424* (3.63)
Exam score	−0.152 (0.11)	−0.006 (0.04)	−0.175*** (0.04)	−0.310*** (0.09)
Work for money	−13.539 (12.25)	−32.063*** (6.08)	−33.557*** (7.04)	−0.969 (13.36)
Rural school	26.742 (26.93)	40.778*** (9.72)	−5.396 (11.05)	−1.334 (21.32)
Girls	−8.391 (13.01)	5.608 (7.19)	11.414 (9.89)	−19.376 (11.17)
Interaction term				
Girls * Livestock (centered)	2.302 (3.23)	4.110*** (1.08)	4.706*** (1.27)	4.189 (2.32)
Girls * Properties (centered)	10.358 (8.68)	17.948*** (4.48)	20.037*** (5.21)	20.495** (7.07)
Girls * Properties^2 (centered)		−3.009 (2.19)	2.557 (2.59)	
Girls * Livestock^2 (centered)			−0.554 (0.29)	
Constant	85.063 (109.96)	108.056* (41.37)	163.367*** (47.78)	113.383 (90.69)
R^2 /Pseudo R^2	0.271	.141	.214	.216
Hat^2		.064	.850	.738

*$p < .05$. **$p < .01$. ***$p < .001$.

household properties ($b = −16.85$, $p < .001$), and household properties squared ($b = 5.79$, $p < .001$) are significant predictors of the amount of time students devoted to studying after school hours. For every one-unit increase in household properties, the predicted amount of time devoted to schoolwork decreases by 16.85 minutes; after the properties increase to a certain level, student study time after school hours starts to increase by 5.79 minutes for every unit increase in possessions. Similarly, at the 50th percentile of student study time, household properties ($b = −21.41$, $p < .001$), and household properties squared ($b = 4.54$, $p < .01$) are significant predictors of how much time students spend on schoolwork. Initially, the predicted study time after school hours decrease by 21.41 minutes for every one-unit increase in household properties, but the direction of the relationship changes when the household properties increase to about four units, at which point the predicted amount of allotted study time after school hours increases by 4.54 minutes for every unit increase in properties. Household property index was not significant at the 75th percentile of student study time after school hours and therefore, the quadratic term was not tested.

On the other hand, livestock ($b = −3.88$, $p < .001$) and livestock squared (b = 0.39, $p < .05$) are significant predictors of study time after school hours at the 50th percentile. For every one-unit change in livestock index, the predicted value of study time after school hours decreases by 3.88 minutes until the livestock index reaches about 15 units, at which point the predicted study time after school hours increases marginally by 39 minutes for every unit increase in livestock index. Livestock was

also significantly associated with study time at the 25th percentile in the quantile regression model but not at the 75th percentile.

Overall, the predicted study time decreases with household assets but as assets increase, the amount of time devoted to schoolwork starts to decrease at a slower rate and at some point, study time starts to increase with increase in assets (as child labor is not needed). This dynamic relationship is consistent with our hypothesized curvilinear relationship between assets and students' study time after school hours. Comparatively, the magnitude of the association between household possessions and study time after school hours is stronger than the association between livestock ownership and study time after school hours; this is consistent with the hypothesis that the nature and strength of the curvilinear relationship between assets and study time after school hours depend on the type of asset. Results of equality of coefficients test confirm that the magnitude of the coefficients for the economic-related variables are statistically different at the 25th percentile, $F(4, 91) = 21.30$, $p < .001$; the 50th percentile, $F(4, 89) = 13.54$, $p < .001$; and the 75th percentile, $F(4, 93) = 3.60$, $p < .01$. Direct comparison between the coefficients of the two types of assets (livestock and possessions) rejects the null hypothesis that the coefficients are equal to each other at the 25th percentile, $F(1, 91) = 20.70$, $p < .001$; the 50th percentile, $F(1, 89) = 21.78$, $p < .001$; and the 75th percentile, $F(1, 94) = 4.56$, $p < .05$.

Moderation results

Results of the interaction terms in Table 2 reveal gender differentials in the relationship between assets and the amount of time spent studying after school hours. Among girls, when household possessions increase by one additional unit, the predicted amount of time devoted to schoolwork after school hours increases by 17.85 minutes ($p < .001$) at the 25th percentile, and by 20.04 minutes at the 50th percentile. That means every time household possessions increase by one unit; girls devote between 17.85 minutes (at the 25th percentile) and 20.04 minutes (at the 50th percentile) more time to their schoolwork compared to boys. Similar moderation results were observed for the gender interaction with livestock, although the magnitude of the coefficient was smaller compared to the gender interaction with household possessions. When livestock owned by the household increases by one additional unit, the predicted amount of time girls devote to their schoolwork during afterschool hours increases by 4.11 minutes ($p < .001$) at the 25th percentile and by 4.71 minutes ($p < .001$) at the 50th percentile. The results also show that among girls, the magnitude of increase in study time after school hours is about five to six times higher when the assets are household possessions compared to livestock.

Other determinants of study time

Several covariates were statistically significantly related to the amount of time spent studying in the three quantile regression models at different significance levels. At the 25th percentile, only engagement in economic activity was negatively and

significantly associated with time spent on schoolwork ($b = -32.06$, $p < .001$). In the same model, rural community ($b = 40.78$, $p < .001$), financial resources for school ($b = 12.67$, $p < .001$), and living in a female-headed household ($b = 12.31$, $p < .05$) were positively associated with time spent studying.

At the 50th percentile, engagement in economic activity ($b = -33.56$, $p < .001$), living in a female headed household ($b = -14.64$, $p < .05$), and academic performance ($b = -0.18$, $p < .05$) were negatively related to time devoted to schoolwork. The only covariate that was positively associated with time spent studying at the 50th percentile was homework habit ($b = 8.38$, $p < .001$).

At the 75th percentile, academic performance ($b = -0.31$, $p < .001$) and female-headed household ($b = -23.05$, $p < .05$) were negatively associated with time spent studying. In the same model, homework habit ($b = 7.42$, $p < .05$), financial resources for school ($b = 15.87$, $p < .05$), and teacher involvement ($b = 22.82$, $p < .05$) were positively linked to time spent studying. Overall, the number of factors that predicted the amount of time devoted to studying diminished at the upper quantile.

Discussion

Given the relatively small sample size of this study, caution must be exercised in generalizing the study findings to the general population of junior high school students in Ghana. More empirical evidence may be required prior to making any definitive conclusions with the findings of this study. Nontherless, the results of this study deepens the scholarly evidence on students' use of study time during after-school hours in resource-limited countries, specifically in Ghana by examining the links between two types of household assets and students' use of time during after-school hours and the gender differences in this linkage. Evidence from the analysis of the study results support three conclusions: students' use of study time after school hours meets general expectations; different assets predict students' use of study time differently, and higher levels of asset ownership favor girls.

The findings presented in this study should be considered in the context of a number of limitations. First, results of the study may not be generalizable to the universe of junior high school students in Ghana and beyond because the study used a small nonprobability sample of students from 2 of 10 geographical regions in Ghana. Second, the outcome variable and many of the predictors used in the study were self-reported variables and therefore the risk of measurement error may be high. Third, the asset indexes, as well as the overall model, may have left out important unobservable variables. With these limitations in mind, we suggest the need for more research studies with larger heterogeneous sample to validate our findings and provide additional insights into the nuances of students' use of study time, its determinants, and its effect on their educational well-being.

Students' use of study time meets general expectations

First, the study revealed that overall; junior high school students in Ghana spend an adequate amount of time on their schoolwork after regular school hours,

regardless of gender. Going by the 10-minute rule, the overwhelming majority of students spend well above the recommended 90 minutes on their schoolwork during afterschool hours. This finding is in line with recent evidence that Ghanaian parents, who are more educated than ever before, have the desire to enroll their children in extra classes. The competitiveness of senior high school admissions, which pushes parents to explore additional ways to increase their children's chances of securing admission, is a driving factor in the growing trend of extra classes (Montegomery et al., 2000). Montgomery and colleagues (2000) also pointed out that because of their low salaries, many teachers are inclined to organize extra classes, which they often charge students for and proactively kindle parents' interest in additional tutoring for their children.

It is worth noting that our finding of geographical variabilityin students' use of study time during afterschool hours contradicts prior evidence that urban students are more likely to engage in additional schoolwork compared to rural students (Montgomery et al., 2000). The conventional wisdom has been that rural children devote comparatively less time to schoolwork during afterschool hours because of their involvement in agricultural work. Research has also shown that children from rural communities are more likely to work compared to their urban counterparts (Blunch & Verner, 2000; Canagarajah & Coulombe, 1997; Ersado, 2005). On the contrary, our study provides evidence that rural students spend more of their afterschool hours on academic tasks compared to their urban counterparts. If more empirical evidence arrives at a similar finding for rural students, it would be a notable shift from the long-standing trend that rural children are at a higher risk of trading off schoolwork for economic activities, particularly in the agricultural sector (Mull & Kirkhorn, 2005). It could also be that most of the children who were solely working now combine work with schooling, as a prior study revealed that over 70% of the children who attend school combined school with work (Mull & Kirkhorn, 2005).

Notwithstanding the overall finding that students are meeting the expected standard regarding time allocation to their schoolwork, the fact that some are spending overly long hours may be a cause for concern. Our results show that the average student spends 50% (1.5 times) more on their afterschool work than the recommended 90 minutes. Nearly a quarter of students (18%) spend twice the recommended standard, and 7% spend three times the recommend length of time. There is little doubt that the lack of time for schoolwork may negatively affect progress in school (Ananga, 2011). At the same time, excessive diversion of children's afterschool leisure time for more schoolwork could have unintended negative psychosocial and physical health implications (Opić & Duranovića, 2014; Piko & Vazsonyi, 2004; Irby & Tolman, 2002). Granted that the 90-minute standard based on the 10-minute rule is too arbitrary and perhaps not based on the Ghanaian reality, it is still a stretch for nearly a quarter of ninth graders to spend over 3 hours daily on their schoolwork, especially when it is not exams week. Moreover, many of these students may attend extra class and then come home to continue their schoolwork.

Although more empirical evidence may be required before any definitive conclusions can be made, there are policy and research implications of the study findings. It might serve parents and students well if regulators and policymakers investigate the growing trend of private supplemental tutoring organized by teachers. Private supplemental tutoring could be helpful under certain circumstances, so we do not recommend its abolishment. However, policymakers and education stakeholders should not overestimate its benefit, especially given that there is little research on the subject in Ghana. Perhaps what might be more helpful is if regulators focused on predatory practices where some teachers underperform during regular school hours to create a need for extra classes. For researchers, the current trend presents an avenue to help deepen the knowledge base on supplemental tutoring and the educational and economic implications for low-income families.

Different assets predict students' use of study time differently

Our findings despite the study limitations support the overall hypothesis that asset ownership is predictive of the amount of time students spend on their schoolwork. However, this relationship varies in two ways. First, our results provide new and comprehensive insights into the non-constant predictive influence of assets on time use after school hours. By using the quantile regression approach, we can point to specific areas in the distribution of students' time use afterschool hours where assets do or do not play a predictive role. Specifically, at the 25th and 50th percentile, both types of assets (livestock and properties) are predictive of students' use of study time after school hours. However, our results also show that asset ownership has little predictive influence over students who spend an excessive amount of time on schoolwork, such as 3-plus hours.

Secondly, our results reveal a dynamic relationship between assets and devotion to study time after school hours. At the lower tail and middle section of the distribution of students' study time, the initial relationship between assets and the amount of time devoted to schoolwork is negative. That means assets relate to use of study time negatively when fewer livestock and properties are owned, but the relationship turns positive as the number of assets held increases. This quadratic trend is consistent with the Luxury Axiom and the permanent income hypothesis' concept of consumption smoothening. Families may borrow their children's labor time to keep production and consumption levels smooth. When livestock increases to a higher level, households may not need children's labor to stabilize consumption. This consumption-smoothing role of livestock is similar to the buffer role of household properties such as land, house, vehicle, canoe, and bicycle/motorbike.

The finding of varying asset effect has practical implications for asset development programs designed to enhance the well-being of low-income families. As such, practitioners and policymakers should think carefully about the assets threshold that might produce optimal outcomes for low-income households. Assisting families in accumulating the highest possible amount of assets is vital because helping such families to accumulate minimal assets may not be sufficient

to produce positive outcomes. Our findings suggest guidance that marginal asset holdings may be inadequate and could produce unintended outcomes.

Practitioners and policymakers must also think carefully about the types of assets they recommend to families as they guide them to build assets. Often, when developing livelihood and economic security programs for rural communities, the expectation is that some form of livestock investment would be among the assets portfolio. As our findings from the equality of coefficients tests reveal, nonlivestock assets can be equally useful if not more relevant and predictive of educational outcomes.

Having high levels of assets benefit girls

Many economic factors (e.g., poverty, engagement in economic activities, and asset holding) predict children's educational outcomes, but the predictive power and direction of the relationships often depend on the child's gender. Our study finds a similar moderating role of gender in the link between assets and students' use of study time after school hours. This finding is consistent with studies that show that when the household has economic constraints, girls are more susceptible to dropping out of school (Brock & Cammish, 1997). In fact, girls are found to be involved in more activities that take them out of school compared to boys (Canagarajah & Coulombe, 1997; Kane, 2004). When some Ghanaian children come home from school, they engage in various tasks, activities, or chores. Our findings suggest that the higher the level of assets held, the more likely girls may spend some of their afterschool hours studying or completing homework. As policymakers and social practitioners advance strategies and policies to promote the educational well-being of girls, it is prudent to consider promising asset development programs that boost the economic security of low-income households vulnerable to income shocks. Such support might create the necessary buffer to prevent the pressure to withdraw some of the children (mostly girls) from school because their parents do not have enough resources to pay for the cost of education (Gubert & Robilliard, 2006).

Conclusion

As previously stated, more empirical evidence may be required before any definitive conclusions can be made about the findings of this study given the relatively small sample size. This study nonetheless, provides important early evidence that suggests that junior high school students in rural and resource-limited contexts use their afterschool time more prudently than previously thought. Moreover, education researchers, policymakers and social work practitioners might also glean new insights into the science of asset effects on educational outcomes. This study contributes to the understanding that the relationship of assets to students' use of study time during afterschool hours is quadratic in nature and therefore, may require large amounts of asset ownership before assets have a positive effect on how students use their time.

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