Parental expectations and school enrolment decisions: Evidence from rural Ghana

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Abstract
We use field data to investigate factors that influence parents’ decisions to enrol children in schools in rural Ghana. The empirical results identified a host of socio-economic and household-level factors including remittances parents expect from investing in education, parents perception of a child’s desirable professions, cost of schooling and discount rate as significant determinants of parental school enrolment decision. When gender of the child and remittances are taken into account, we show male parents are more likely to invest in education of boys than girls because they expect significantly higher returns from their investment in boys. Female parents do not show such gender preference. The proportion of children enrolled in school is positively related to average cost of schooling for male parents. Gender of parent plays a significant role in school enrolment decision making.

1. Introduction
When Ghana gained independence in 1957, only 3.6% of the country’s population had formal education (UNESCO, 1958). The 1961 Population and Housing Census, which was the first comprehensive attempt to document socio-economic indicators in post-independence period, revealed great disparity in school enrolment between rural and urban areas of the country (Graham, 1971). Ghana experienced severe economic and political difficulties in the late 1970s, which resulted in a steep decline in productivity and living standards. Public spending on education and related services plummeted, which had consequent effects on school enrolment that has persisted in rural areas over the decades. Abu-Ghaida and Klasen (2004) estimate primary school enrolment in rural Ghana at 31% compared with about 77% in the country as a whole. Estimates in the 2008 Ghana Living Standard Survey (GLSS08) (Ghana Statistical Service, 2008) put school enrolment at about 86.3% for the country, but the figure is 54% in rural areas. In an attempt to address the gap in rural and urban school enrolment, a range of programmes have been implemented by governments over the years aimed at increasing school enrolment in rural communities. They include construction of new school buildings in rural areas, Free Universal Primary Education, School Feeding Programme and Free School Uniform programmes launched in 1980s to increase school enrolment. Direct costs of schooling to households can impose a financial burden on rural households and widen gender the gap in access to education (Lucas and Mbiti, 2012). Policy measures that involve supplying school uniforms and books and waiving tuition fees can help improve school enrolment.
However, policy policies tend to focus more on supply-side factors affecting school enrolment than demand-side factors that emanate within the household level. Demand-side measures are more important in rural communities where the opportunity cost of school enrolment is higher owing to a concentration of economic activities that make child labor remunerative. Parents receive returns in the current period by engaging them in a range of income generating activities such as supplying labor in the family enterprise (agriculture, mining, fishing, petty trading, etc.), providing childcare for younger siblings, undertaking household chores or paid work outside the home to supplement household income (Dillon, 2013). Consequently, school enrolment imposes a high cost on resource-poor households in rural areas because it involves the parent forgoing the opportunity to earn income from engaging children in income-generating activities in the current period and incurring direct costs of schooling in expectation of an uncertain flow of remittances in the future. Therefore, measures to reduce rural parents’ dependence on labor supply from children and expectation of remittances such as from the rural social security system should be considered in addressing the problem of rural–urban divide in school enrolment. The growth in youth unemployment in Ghana and in most SSA countries in recent years coupled with the lack of rural income protection and social security indicates that parents’ investment and consumption approach to education may provide an understanding of rural-urban divide in school enrolment.

We posit that rural parents deal with the household resource allocation problem by enrolling a proportion of their children at school (expecting uncertain returns in the future) and keep a proportion at home to work (yield certain returns in the current period) to supplement household income. Felderer (1975) suggests rural parents see children as investment and consumption goods. However, human capital and familial dimensions to the problem make it more complex than conventional portfolio allocation and capital budgeting decisions. The rural–urban divide in school enrolment on educational and labor market prospects of children of rural residents is not limited to Ghana and SSA. Fu and Ren (2010) notes that the *hukou* (household registration) system in China ‘overwhelmingly suggests that individuals’ human capital is largely determined by the place where they were born (i.e. rural or urban); and the place they received compulsory education has caused educational inequality and “affects their labour-market return” (p. 592). Moulden and Bradford (1984) used path analysis to show that the local resident environment or catchment area has a significant influence on children’s educational attainment, especially for girls.

We show that school decisions in rural Ghana are influenced by parent- and child-specific factors including expectations of remittances (returns) from their investment, cost of schooling, gender of the child, age of the child, parent’s educational attainment, number of children in the household, parent’s discount rate, number of spouses, land ownership and a host of other factors. The aim is to address the gap in the literature and provide policy makers with research evidence to address the rural–urban divide in school enrolment and human capital development. The rest of the paper is structured as follows: Section 2 presents the modeling framework and data collection. Section 3 presents and discusses the empirical results. Finally, section 4 supplies some concluding statements and policy recommendations.

### 2. Modeling Framework and Data Collection

The neoclassical household behavior model (also known as the unitary model) contextualizes the basic framework of intra household decision making (Samuelson,
The model assumes members of a household have a common utility function and behave as a single entity in taking economic decisions (Vermeulen, 2002). The intuition behind the unitary model is particularly useful for examining household decisions in rural Ghana. Households and communities in rural Ghana by tradition and culture are commonly headed by unitary figures (often males) who make or sanction decisions on education, land tenure, marriage and crop production. Consequently, we assume that unitary parents (heads of household) have homothetic preferences and maximize the quasi-concave utility function in human capital investment subject to income and wealth constraints (Thomas, 1990).

The parent allocates a proportion of his or her wealth gained from current labor market activities to current consumption and the rest is invested in the education of children with the expectation of yielding returns in the form of remittances in the future as retirement income. Haddad et al. (1997) examined the extent to which parents would forgo current consumption to allocate resources to children’s education. Becker (1994) notes that a parental decision to invest in children’s human capital yields returns that would accrue not only to the children but also to parents in the form of transfers that it generates in the future.

From the above, we can bifurcate the unitary parent’s life into: child rearing stage when the parent is in the labor market, denoted by \( t = 1 \) (Period 1) and retirement (old age) stage \( t = 2 \) (Period 2). The parent with no gender bias in relation to the children consumes composite goods \( c_1 \) and \( c_2 \) in periods 1 and 2 respectively. The household is endowed with wealth \( w \) and \( N \) discrete number of children, of which the proportion \( \alpha \) is kept at home to work to generate income to boost current consumption, and \( 1 - \alpha \) proportion (with \( \alpha \in (0,1) \)) sent to school as investment in human capital. The number of children \( N \) is an exogenous positive integer because the emphasis is on human capital investment decisions, not on fertility. If \( (1 - \alpha) > 0 \) that is, when parents send a child to school, they are faced with the decision to trade-off a certain proportion of \( c_1 \) for an uncertain \( c_2 \) including future remittances conditional on the child securing employment in the future. Owing to uncertainty in the flow of returns (remittances) in the future, the parent may reduce the risk associated with enrolling children in school by discounting the utility associated with future remittances at the rate \( \delta \) (with \( \delta > 0 \)) through increasing \( \alpha \) to meet current consumption. Therefore, the household’s expected utility function from the schooling decision is:

\[
Eu(c_1, c_2) = u_1(c_1) + \frac{u_2(c_2)}{1 + \delta}.
\]

The utility function is assumed to be concave such that \( u_1' > 0, \ u_2' > 0, \ u_1'' < 0, \ u_2'' < 0, \ u_1' = u_2'' > 0 \). Becker (1981) notes that intra-household resource allocation approach involves present costs and future benefits. The household receives immediate current consumption boosting benefits from \( \alpha N \) number of children kept at home, but incurs a cost of educating \( z = (1 - \alpha)N \) children enrolled in school. Therefore, the functional form of current period benefit \( \mu(\alpha N) \) increases monotonically with the number of children kept at home but decreases with the number of children sent to school. However, the cost function \( T(z) \) increases with the number of children sent to school (i.e. \( z \) increases).

For analytical convenience, we assume that the total benefit of educating children \( \theta z \) is linear in the number of children sent to school (where \( \theta \) is the marginal benefit per child). Given that the realization of the return (benefit) is probabilistic, we denote
\( p \) as the probability associated with return from investing in children’s education and \( q \) as price of a composite good. Following standard consumer choice theory, \( q \) is assumed to increase at the rate of interest \( r \). From the above, we can express the proportion of children enrolled in school as a linear function of the vector of pertinent household and parent-specific variable (a full derivation of equation (2) is supplied in the Appendix):

\[
\alpha_i = \beta X_i + \varepsilon_i
\]  

(2)

where \( X \) is a matrix of explanatory variables including, but not limited to, the perceived probability of the child getting a job in the future, the discount rate (measured as the parent’s time preference), rewards parent expect to receive from children’s education, the average cost of education, income of head of household, assets of parent, land ownership and the number of children in the household, which influences school enrolment, and \( \varepsilon \) is a vector of normally distributed error terms. It is hypothesized a priori of \( \beta \neq 0 \) for all elements of \( X \).

The data used in this study were obtained from a household survey conducted between January and March 2012 in rural Ghana. A total of 800 heads of household were interviewed but the sample used in in the estimations was reduced to 720 due to missing variables for some interviewees. In determining the sample size of this study, a multi-stage sampling was used. First, geographical regions in the country were stratified into two broad strata: the northern and southern strata. The northern stratum consists of Upper West, Upper East, Northern, Brong Ahafo and Ashanti regions; and the southern stratum consists of the Volta, Central, Eastern, Greater Accra and Western regions. This was done to give each region a fair chance of representation. We used the simple random sampling (SRS) technique to select two regions from each stratum. The SRS technique was further used to select two districts from each of the selected regions. Finally two villages were selected from each district to make a total of 16 communities, and 50 households were interviewed from each community. The questionnaire was divided into six sections requiring: socioeconomic and demographic information of the household, information of spouses, children in the household aged between 6 and 15 years, indication of wealth, household monthly expenditure and head of household’s attitude to risk. Most of the questions were short-closed and few open-ended, which ensured that each questionnaire was delivered and collected by the research assistant in one visit.

3. Results and Discussion

This section presents and discusses the results of equation (2) that was estimated using Baum et al. (2007) enhanced IV/GMM 2SLS regression estimation routines. To examine the influence of gender of parent on decision-making, we ran separate regressions on sub-samples of male and female heads of households and the full sample. Columns (1) and (2) of Table 1 contain empirical results of male- and female-headed households respectively, while column (3) contains full sample results. The cost of education is endogenous to systems and we found the “number of spouses” as a suitable instrumental variable for male-headed households, and the “number of male children per household” was a suitable instrument for the female sample (Bound et al., 1995). The \( R^2 \) shows that on average about 46% of total variation in the
model are explained by the explanatory variables and \(F\)-statistics and diagnostic tests confirm that the models are robust.

The results show that the rewards parents expect from their children’s education have significantly positive effect on number of children parents enrol in school in rural Ghana. The null hypothesis that benefits from children’s education do not influence number of children parents enrol in school was rejected at 5% significant level for the full-sample and female headed households; and 1% and 10% significant level for boys and girls male headed of households respectively. These findings confirm that remittances are significant determinants of the number of children enrolled in school in rural Ghana. A 10% increase in benefits from children’s education would lead to a 4% increase in school enrolment. Unlike female parents, the proportion of children enrolled in school by male parents is significantly related to the number of male children in the household. The full sample results show that the proportion of children

| Variables                        | Male-headed household | Female-headed household | Full sample |
|----------------------------------|-----------------------|-------------------------|-------------|
| Benefit from child education     | 0.21                  | 0.523*                  | 0.442       |
| Benefit from child education (boy)| 0.128***             | 0.851**                 | 3.312**     |
| Benefit from child education (girl)| 0.018*              | 0.016**                 | 0.364**     |
| Number of boys                   | 0.044*                | 0.434                   | 0.012       |
| Number of girls                  | 1.283                 | 0.276                   | −0.02       |
| Parental education               |                       |                         |             |
| Primary level                    | 0.861***              | 0.961                   | 0.965**     |
| Secondary level                  | 0.095**               | 0.173*                  | 0.444**     |
| Tertiary level                   | 0.017**               | 0.158***                | 1.006***    |
| Prob. child gets the desired job | 0.056                 | 0.712*                  | 0.529       |
| Prob. child gets the desired job (boy)| 0.476**           | 0.665**                 | 0.132**     |
| Prob. child gets the desired job (girl)| 0.107***        | 0.097**                 | 0.546**     |
| Child age                        | 0.953                 | 0.876                   | 0.998       |
| Child age (boy)                  | 0.226                 | 0.087*                  | 0.111       |
| Child age (girl)                 | 2.771                 | 0.231*                  | 0.373       |
| Cost of educating a child        | 3.23***               | −0.991                  | 1.321***    |
| Head of household discount rate  | −0.034*               | −0.401                  | −0.009      |
| Asset of head of household       | 0.431*                | 0.237                   | 1.241**     |
| Monthly expenditure of head of household | 0.418               | 0.123                   | 0.376       |
| Plot of land                     | −0.081                | 0.432                   | −0.562      |
| Male-headed household            |                       |                         | 1.081***    |
| Constant                         | 5.314***              | 3.004*                  | 3.134**     |
| Observations                     | 608                   | 112                     | 720         |
| \(R^2\)                          | 0.438                 | 0.472                   | 0.457       |
| \(F\)-statistics                | 74.16                 | 67.83                   | 53.99       |
| \(P > F\)                        | 0.000                 | 0.001                   | 0.000       |
| Weak identification test (Cragg–Donald Wald \(F\) statistic) | 29.968               | 11.342                  | 7.238       |
| Underidentification (Anderson canon. corr. LM statistic) | 29.545               | 14.006                  | 7.283       |

Notes: Dependent variable: proportion of children enrol in school. *** \(p < 0.01\); ** \(p < 0.05\); * \(p < 0.1\).
enrolled in the household is positively related to number of male children but negatively related to number of female children. However, both coefficients are statistically insignificant. This result confirms the relationship between expected benefits and number of children enrolled in school found by Bennell (1996).

The results further show that parents' educational attainment is positive and statistically significantly related to number of children enrolled in school. Parents’ educational attainments significantly influence the number of children enrolled in school. Previous studies show a positive link between parental education and school enrolment of children, especially for girls (Kambhampati and Pal, 2001; Weir, 2007). Improvement in female education has been linked to family health and good home management (Lundborg et al., 2014).

The probability of children getting desired jobs or going into desirable professions in the future is also statistically significant in explaining parents’ decision to invest in children’s education—significant at 5%. The results show that the higher the parent’s perception of a child’s chances of getting the desirable jobs in future, the higher would be their investment in education. Parents' investment in a child’s education decreases as perceived probability of the child getting suitable jobs decreases. This implies that school enrolment would increase if they expect children to have favorable employment opportunities after schooling, which they could benefit from. Foltz and Gajigo (2012) conclude that education is considered as an investment and parents invest in children’s education if the benefits exceed the cost. Earlier study by Mincer (1975) shows that differences in earnings reflect differences in returns to education between individuals. However, the results further indicate that male parents are more likely to consider a child’s future career and job prospects in making school enrolment decisions than female-headed households. In rural Ghana, men are generally employed in farming, mining, fishing and related activities, while women are housewives, petty traders or unemployed. In particular, the majority of female-headed households consist of women who are divorced or separated.

The interaction of child gender with expected benefit and probability of securing desired jobs is included in the model to examine gender biases in parents’ expectation of remittances and expectation of children getting desirable jobs. The results confirm that the benefits and probability of going into desirable professions are statistically significant determinants of a parent’s decision to invest in education of children of both sexes. However, male parents more strongly associate remittances with investment in sons’ education than daughters’; while female parents do not distinguish between sons and daughters in terms of preference for remittance. Nonetheless, age of the child is a more significant factor for female parents than male parents. The age of the child is not statistically significant for both boys and girls under male-headed households, but is statistically significant for female heads of households. This is because most rural women who are not formally employed use labor supply from girls to assist them in house work, childcare and small scale economic activities to supplement the household income. Consequently, as children grow older, the opportunity cost of sending the child to school becomes higher with female-headed households.

The a priori expectation is that the average cost of education and the number of children parents enrol in schools are negatively related. However, our results show a statistically significant positive relationship between the average cost of education and the number of male children enrolled in school in the male sub-sample and the overall sample. These results are supported by the GLSS08 report, which shows that an
increasing number of children are enrolled in schools regardless of rising costs. These findings contradict the Pritchett and Filmer (1999) conclusion that the average cost of education is inversely related to the number of children enrolled in school. The positive relationship between cost of education and number of children enrolled in rural Ghana could be due to intangible benefits associated with investment in children’s education as well as policies geared towards an increasing uptake of formal education. Moreover, parents select specific schools because they believe that those schools offer better education and enable their children to get good exam results even though it costs them more.

The discount rate variable is negatively related to the number of children enrolled in school but only statistically significant for male-headed households. In theory, parents with higher discount rates are likely to enrol a lower proportion of children in school than heads with a lower discount rate for a given level of expected benefit. The negative relationship indicates that rural parents consider children as both investment goods and consumption goods. The investment component is so strong that it outweighs the consumption component. Lang and Ruud (1986) show an inverse relationship between discount rate and present consumption and investment in education. However, parents also derive intangible benefits from investing in their children’s education. For example, the community may accord higher respect and societal recognition to parents who enrol their children in school. Therefore parents may consider esteem factors and intangible benefits alongside tangible reward in their investment attached to educating their children. In addition, parents may invest in their children’s education because they consider it as part of their parental responsibility. Therefore, rural parents can allocate more resources to their children’s education than conventional investment appraisal rules would suggest. Becker and Tomes (1994) show that culture and societal influences also affect the parents’ decision on human capital investment.

Household assets are a positive and significant determinant of school enrolment. The null hypothesis that assets of a household do not influence the proportion of children enrolled in school was rejected at 5% and 10% for the combined sample and male sample respectively. Households with higher income have access to more resources to invest in children’s education. Donkoh and Amikuzuno (2011) noted that household income is one of the main determinants of school enrolment.

The size of land owned by the head of a household was not statistically significant in explaining the decision to invest in children’s education but shows the expected negative sign. The inverse relationship between land ownership and school enrolment indicate that parents with a large amount of land would prefer more of their children to work on the land than enrol them in school and vice versa. Kenny et al. (1979) found that owing to a decline in labor supply requirements of children in farming activities, parents have increased the number of hours their children spend in school as a result of the benefits they expect to receive. The results shown in both regressions indicate that land ownership is not a significant factor in parents’ decisions about children’s education probably because they expect higher returns on education in modern times than from farming activities.

The gender-specific coefficient in full-sample results indicates that the gender of the parent and child play a significant role in the parents’ decision to send their children to school. The results further shows that male-headed households have access to greater resources than female-headed households. This evidence is supported by findings of the GLSS08, which shows that more women in Ghana live below the poverty line than men.
4. Conclusion and Policy Recommendations

This study identified a number of factors including returns parents expect from children, future job prospects, household wealth, discount rate of parent, number of children in the household, parents’ educational level, the age of the child and gender of the parent as key determinants of households’ decision to invest in education. This could be due to intangible benefits parents associate with investing in education and the quality parents associate with schools that charge higher fees.

We offer the following recommendations to enable the government of Ghana to increase school enrolment in rural areas. First, government policies aimed at influencing the level of school enrolment should not concentrate only on supply-side issues because demand-side factors at household level are vital in school enrolment decisions. Therefore, the government should create more job opportunities for school-leavers and graduates. For example, the National Youth Employment Programme must be expanded to employ more young people especially from rural areas. The lack of formal job opportunities coupled with demand for labor supply of children in family-owned businesses such as petty-trading, farming and fishing, which do not need specialized skills, help to inflate the opportunity cost of schooling. Therefore, policies aimed at increasing job opportunities for the educated in the country can help to reduce the opportunity cost of investing in children’s education. Second, government should involve rural parents in formulation of educational policies. This could be done by organizing focus group discussions at community level to be aware of the expectations of parents before coming out with the policies. This is because parents’ expectations are likely to be taken into account if they are involved in decision-making process. Finally, eliminating liquidity constraints can also have positive effects on child school enrolment. In particular, it would be possible to use microcredit programmes to enable parents, who are unable to procure loans because of lack of collateral, to acquire loans and this situation would encourage them to invest in their children’s education.

Appendix

From the above, the expected net benefit of investing in a child’s education, \( A \), is specified as:

\[
A = \frac{p\theta N(1-\alpha)}{1+r} - T((1-\alpha)N). \quad (A1)
\]

Therefore, the household’s budget constraints is given by,

\[
w + \mu(\alpha N) + \frac{p\theta N(1-\alpha)}{1+r} - T((1-\alpha)N) \geq q(c_1 + (1+r)c_2).
\]

\[
w + \mu(\alpha N) + \frac{p\theta N(1-\alpha)}{1+r} - T((1-\alpha)N) = q(c_1 + (1+r)c_2) \quad (A2a)
\]

The corresponding Langragian function of the unitary parent’s utility of schooling investment is:
\[ L(c_1, c_2, \alpha, \lambda) = u(c_1) + \frac{u(c_2)}{1+\delta} \]
\[ + \lambda \left( w + \mu(\alpha N) + \frac{p\theta N(1-\alpha)}{1+r} - T((1-\alpha)N) - q(c_1 + (1+r)c_2) \right). \]  
(A2b)

A first order derivative of (A2b) with respect to present and future consumption and the parent wealth would give us the optimum values of current consumption and endowment to invest in a child’s education,

\[ \frac{\partial L}{\partial c_1} = u_1(.) - \lambda q = 0 \]  
(A3)

\[ \frac{\partial L}{\partial c_2} = 0 \Rightarrow \frac{u_2(.)}{1+\delta} - \lambda q(1+r) = 0 \]  
(A4)

\[ \frac{\partial L}{\partial \alpha} = 0 \Rightarrow \mu_\alpha = \frac{\theta pN}{1+r} - T_\alpha \]  
(A5)

\[ \frac{\partial L}{\partial \lambda} = 0 \Rightarrow w + \mu(\alpha N) + \frac{p\theta N(1-\alpha)}{1+r} - T((1-\alpha)N) - q(c_1 + (1+r)c_2) = 0 \]  
(A6)

We divide equation (A3) by equation (A4)

\[ \frac{u_1(.)}{u_2(.)} = \frac{(1+\delta)}{(1+r)} \]  
(A7)

For further analytical convenience, we assume a linear utility function of the form \( u(c) = \ln c \). In addition, the following functional forms are assumed: \( T(\cdot) = \nu(1-\alpha)N \), and \( \mu(\alpha N) = (\alpha N)^2 \). Consequently, equation (A7) is rewritten as:

\[ \frac{c_2}{c_1} = \frac{(1+\delta)}{(1+r)} \Rightarrow c_2 = \frac{(1+\delta)}{(1+r)} c_1. \]  
(A8)

Using a specific functional form equation (A6) can be re-specified as

\[ w + (\alpha N)^2 + \frac{p\theta N(1-\alpha)}{1+r} - \nu(1-\alpha)N - qc_1 \left( \frac{2+r+\delta}{1+\delta} \right) = 0. \]  
(A9)

Similarly, we can specific functional forms to re-specify equation (6) as:

\[ 2\alpha N^2 = \frac{\theta pN}{1+r} + \nu N. \]  
(A10)

Making \( \alpha \) the subject of the relation from equation (A10), we have

\[ \alpha = \frac{\nu(1+r) - \theta p}{2N(1+r)}. \]  
(A11)

Thus,
\[
\alpha = f(v, r, N, p, \theta) \\
\alpha_i = \beta X + \epsilon_i
\]

where \( X \) is a matrix of explanatory variables consisting of determinants of school enrolment and \( \epsilon_i \) is a vector of normally distributed error terms. The empirical results of this paper are obtained from estimation of equation (A12). It is assumed \textit{a priori} that \( \beta > 0 \) for \( r, p \), and \( N \) and \( \beta < 0 \) for \( v \) and \( \theta \).

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