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Child Labour and Land Ownership: Empirical Evidence of an Inverted-U in Gambia

[1] F. A. Ishonkulova, [2] Mukhammadaziz Rozokov

[1] Samarkand Institute of Economics and Service independent researcher
[2] Student of Samarkand Institute of Economics and Service, Samarkand, Uzbekistan

Abstract: This article presents a comprehensive analysis of the relationship between child labour and land ownership in Gambia, focusing on the empirical evidence of an inverted-U pattern. Using econometric techniques and data obtained from a representative sample of households, the study investigates the impact of land ownership on child labour incidence.

Key words: child labor, poverty level, rural household, land holding, land ownership, inverted-U, household income.

Importance The current article will analyze the relationship of land holdings and child labor for Gambia Republic as it was not studied in this country before. The studies will specifically reveal the impact of land holding on child labor in the form of wealth. The reason of selecting this country was the agriculture of it. The main income of the population is gained via agriculture by emphasizing the land ownership as a wealth. The article contributes to the child labor literature through a simple yet comprehensive model and an empirical application by revisiting the relationship between wealth (landholding) and child labor; more specifically the article evaluates what happens to child labor in households that are distinctly placed at various levels of the landholding distribution. The model illustrates the relationship of different forms of child labor with each other and with household production and assets.

Objectives The relationship between rural household productive assets and child labor in developing countries is complex. Some empirical evidence shows that child labor tends to increase as land holding increases, or there is an inverted U-shaped curve relationship between the probability of putting children to work and land holding. This article shows that the relationship between use of children as laborers and land holding is nuanced. Child labor generally decreases as per capita land holding increases, but there can be an upward bump in the relationship between child labor and landholding near the middle of the range of land per capita.

Methods The bump can be explained theoretically by the relationship between the marginal productivity of a child worker on the farm and the marginal value placed on his/her education at different levels of wealth. From the perspective of policy making, the policy maker should be alerted that the programs to promote school retention should not necessarily focus only on the poorest households in rural areas. There is a high probability that middle-wealth households put their children to work, and this probability may change by some other factors such as gender of child and agro-ecological conditions.

Results The outcome of descriptive statistics calculated by region as well. Our focus here is to obtain reliable estimates of the effects of the characteristics of children and households on child labor while recognizing that village characteristics may also have an effect on it and may be correlated with

household characteristics. Hence we use village fixed -effects regression for all our analysis. The standard errors are robust and account for correlation within clusters.

Conclusion This paper examined the impact of wealth on child labor using a unique data set that provides information on individual hours worked as opposed to a dummy that indicates whether a child works or not. This has two major advantages. First, the detailed activity information allowed us to include domestic work done by children in their own homes as child labor, which we find to be the largest component. Second, since our measure of child labor is not a censored or binary variable we can estimate the effects of various factors on child labor through regression analysis, which only requires the error term of the regression equation to be uncorrelated with the 15 regressors. It was found that, with respect to the two important rural assets and land, child labor increases with asset levels way past the average values of the assets. With respect to land we find that child labor declines well before the observed maximum land holding.

Child labor is common around the world, particularly in developing countries. In 2012, sub-Saharan Africa (SSA) had the highest rates of working children, with 26.2% of children aged 5–14 being employed (Diallo, Etienne, & Mehran, 2013). SSA is one of the poorest regions of the world, and it also has one of the youngest populations (Bongaarts & Casterline, 2013). These facts raise concerns about the employment of children; long-run poverty reduction and growth may be compromised by use of children in productive activities rather than investing in human capital through schooling (Heady, 2003). Most working children in rural areas of SSA are involved in agriculture and are frequently employed by their parents (International Labour Organization, 1996; Edmonds & Pavcnik, 2005a, 2005b). As reductions in child labor can improve economic growth in the long-run, factors associated with use of child labor in agriculture should be identified.

When a household with small amounts of land puts many workers in its fields, the marginal product of additional workers will be low. As holding size increases, the marginal product of labor increases. When holding size is very large, the marginal product increases at a decreasing rate and it finally reaches a limit. This limit exists because if the amount of land is great enough, some land will remain unused, because there will be insufficient household labor to cultivate the fields, and in the absence of a labor market, non-family workers cannot be hired. Therefore the incentive for putting children to work on farms, which comes from the gap between the marginal product of the child and the marginal return to education, changes in a complex way as land size increases. This discussion does not apply only to rural households; it applies to any household with productive assets (wealth). For example, a productive wealth in urban areas can be in form of owning a shop. As a result, a similar analysis can be applied to urban households. Different factors affect the productivity of a child on farm (e.g. the productivity of land). In farming areas where rainfall is higher and soil quality is better, the income effect of the land is larger (more land is associated with higher farm incomes in high-quality areas compared to low-quality areas), so child labor can be lower, holding other factors fixed, in high-rainfall areas. On the other side, the productivity of the child on farm is higher in such areas; incentives for putting the child to work can be stronger in areas with favorable agro-ecological conditions. It will be shown that incentives for putting children to work for very poor households are stronger in wet areas (more productive) than in dry areas, and also it will be shown that equal increments in wet land owned, holding other factors constant, leads to sharper declines in child labor in comparison to dry land owned. The bump in the relationship between holding size and use of children on the farm has an important implication from the perspective of policy making. Both very poor households and households with medium-sized holdings are likely to have high incidences of child labor, so policy makers wishing to reduce child labor should focus on both classes of farms. The former group would be excluded if the relationship between child labor and wealth were presumed to have an inverted U shape like Basu et al. (2010). The latter group would be excluded if poverty were thought to be the sole cause of child labor. In addition, as seen in the empirical results it is possible that households who hold small amounts of land are less/more likely to send their children to work than households whose land holding is in an intermediate range. The results suggest that the pattern of association between child labor and land holdings can change over time; policy makers should be aware of this shifting relationship. This relation can be affected by the gender of

the child or agro-ecological conditions. In order to complete the article Gambia has been selected, as Gambia considered as the smallest country in Africa and the economy of the country depends on agriculture. Consequently, the wealth, in this country can be revealed in land ownership. Moreover, Gambia is the poorest country and most of the respondents in dataset are landowners are from Gambia. Moreover, the relationship between landownership and child labor was not studied in Gambia and my current paper will be one of the first studies. In order to complete the calculation process, 12 variables were assigned. Among the 2 are dependent. Dependent variables were illustrated in hours, not dummy. Because of this reason, the OLS regression was applied. The table of dependent and independent variables attached below. The dataset has been found out in MICS survey. In order to get the dataset, the letter has been written and after got the permission.

Table 1. Description of variables used in analyses

Child labor	Dependent variable- hours the child worked outside of the household during the previous week ranging from 0 hours to 80 hours
Engaging to household chores	Dependent variable- hours the child engaged with household chores during the previous week ranging from 0 hours to 75 hours
Age	Independent variable – measured in years ranging from 5 years old to 17 years old
Male	Independent variable –measured in binary form : male-1 female-0
Attending school or early childhood program	Independent variable – dummy, 1- if she/he is going to school currently, 0-if she/he is not going to school currently
Number of HH members	Independent variable – measured in the count form ranging from 1 member to 77 members
Number of women 15-49 years	Independent variable –measured as count form -number of adult women in the household ranging from 0 to 25 members
Number of children under age 5	Independent variable –measured as count variable- number of young children under 5 ranging from 0 to 20
Region	Independent variable – categorical, 8 regions of the Gambia categorized by numeric value
Household own any animals	Independent variable –dummy equals to 1- yes, there are some 0-no animals
Household head education	Independent variable- categorical: 0-no education- base category, 1-primary education 2-secondary or higher education
Area of land	Independent main variable- measured in acres - area of the land household owns.

Variables are quantities that may assume any one of a set of values. In order to accomplish the article, 12 variables were selected for the purpose of calculation for the empirical evidence. Child labor and engaging child into household chores were selected as a dependent variable while the area of land, household head education, household own any animals, region, number of children under age 5, number of women 15-49 years, number of HH members, attending school or childhood program, male and age were selected as an independent variable.

The summary statistics of all these variables are given in Table 2

Table 2. Descriptive statistics

	(1)	(2)	(3)	(4)	(5)
	N	mean	sd	min	max
Age	5,716	10.09	3.678	5	17
Attending school or early childhood programme	5,850	0.722	0.448	0	1
Hours worked in past week	5,850	2.641	7.338	0	80
Number of hours engaged in housework in past week	5,850	4.177	7.092	0	75
Urban residency	5,850	0.467	0.499	0	1
Male	5,850	0.451	0.498	0	1
Number of HH members	5,850	9.899	6.878	1	77
Number of women 15 - 49 years	5,850	2.276	1.821	0	25
Number of children under age 5	5,850	1.633	1.690	0	20
Household own any animals	5,846	0.710	0.454	0	1
Area of the land in acres	5,522	5.793	13.34	0	197.7

The outcome of descriptive statistics calculated by region as well. The largest region named Kerewan constituted 10.2893 St. dev. While the mean illustrated 4.847297. The smallest results were observed in the region named Brikama in terms of St. dev. Constituting 4.880878 while the mean indicators was 1.413754. The detailed explanation in written form will be provided in the final version of paper and in the following table number 3.

Table 3. OLS estimation of child working

	(1)	(2)	(3)	(4)
VARIABLES	Without controls	With child controls	With household controls	With region fixed effect
The area of the land	0.0856***	0.0849***	0.0638***	0.0323**
	(0.0145)	(0.0149)	(0.0155)	(0.0164)
The area of the land squared	-0.000556***	-0.000589***	-0.000443***	-0.000247**
	(0.000131)	(0.000131)	(0.000125)	(0.000121)
Age		0.448***	0.526***	0.527***
		(0.0303)	(0.0476)	(0.0473)
Male		0.845***	0.777***	0.775***
		(0.206)	(0.204)	(0.203)
Attending school or early childhood programme		-1.677***	-1.580***	-1.406***
		(0.290)	(0.382)	(0.388)
Number of HH members			0.0474	0.0497
			(0.0340)	(0.0330)
Number of women 15 - 49 years			-0.358***	-0.297***
			(0.0920)	(0.0917)
Number of children under age 5			-0.0264	-0.115
			(0.0908)	(0.0919)
Household own any animals			1.227***	0.605**
			(0.226)	(0.250)
Household head education: no				
Primary			0.253	0.215

			(0.369)	(0.368)
Secondary +			-1.184*	-1.083*
			(0.626)	(0.617)
Region: Banjul				
Kanifing				0.0658
				(0.350)
Brikama				0.0984
				(0.323)
Mansakonko				0.966**
				(0.395)
Kerewan				3.363***
				(0.508)
Kuntaur				1.595***
				(0.459)
Janjanbureh				0.597
				(0.377)
Basse				1.879***
				(0.464)
Constant	2.239***	-1.344***	-2.504***	-3.141***
	(0.110)	(0.283)	(0.397)	(0.487)
Observations	5,522	5,399	5,377	5,377
R-squared	0.008	0.069	0.082	0.098

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

In Table 3 and 4, we observe that child labor increases with age, the effect being particularly pronounced for girls. The statistically significant (at 1 percent) negative sign of female dummy suggests the absence of an unconditional female bias. The bias depends on their age. Older girls are made to work more (probably for sibling care). The presence of female adults in a household helps reduce child labor more than the presence of male adults or other children. Similarly educating females is more effective in reducing child labor than educating males. More interestingly, the regression exercise suggests strongly that there is indeed an inverted-U relationship with land for all groups of children.

Table 4. OLS estimation of engaging household chores

	(1)	(2)	(3)	(4)
VARIABLES	Without controls	With child controls	With household controls	With region fixed effect
The area of the land	0.0945***	0.0953***	0.0732***	0.0299**
	(0.0144)	(0.0135)	(0.0139)	(0.0141)
The area of the land squared	-0.000682***	-0.000678***	-0.000533***	-0.000287***
	(0.000122)	(0.000119)	(0.000111)	(0.000101)
Age		0.593***	0.672***	0.672***
		(0.0257)	(0.0400)	(0.0395)
Male		-4.269***	-4.325***	-4.298***
		(0.163)	(0.166)	(0.165)
Attending school or early childhood programme		-0.864***	-0.695**	-0.441
		(0.231)	(0.281)	(0.282)
Number of HH members			0.0242	0.0230
			(0.0362)	(0.0361)

Number of women 15 - 49 years			-0.276***	-0.241**
			(0.107)	(0.108)
Number of children under age 5			0.122	0.0110
			(0.0802)	(0.0817)
Household own any animals			0.928***	0.355*
			(0.189)	(0.213)
Household head education: no				
Primary			0.148	0.0995
			(0.283)	(0.280)
Secondary +			-1.169**	-1.015**
			(0.516)	(0.509)
Region: Banjul				
Kanifing				0.288
				(0.300)
Brikama				0.711**
				(0.304)
Mansakonko				0.477
				(0.343)
Kerewan				2.803***
				(0.447)
Kuntaur				2.364***
				(0.414)
Janjanbureh				0.722*
				(0.376)
Basse				3.657***
				(0.441)
Constant	3.794***	0.462*	-0.697**	-1.567***
	(0.100)	(0258)	(0.347)	(0.388)
Observations	5,522	5,399	5,377	5,377
R-squared	0.010	0.202	0.212	0.235

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

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