



Child Labor and Household Land Holding: Theory and Empirical Evidence from Zimbabwe

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Summary. — 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 paper 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. 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. This pattern is repeated in three surveys conducted in Zimbabwe, in 2001, 2007–8, and 2010–11. 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. © 2017 Elsevier Ltd. All rights reserved.

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1. INTRODUCTION

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.

Zimbabwe is a SSA country where achievements in schooling are particularly noteworthy (Larochelle, Alwang, & Taruvinga, 2014). Achievements in education and provision of other social services since Independence, however, are threatened by ongoing economic crises. The people of Zimbabwe have faced severe economic difficulties in the recent past. In the decade beginning in 2000 inflation rates began to grow and, by 2008, one of the more severe hyperinflations in recent memory racked the economy (see Appendix A for a description of the hyperinflation). During 2000–08, recurring droughts, a mismanaged land reform, and structural problems associated with agriculture led to widespread suffering and emigration of professional workers including teachers and nurses. In a move toward stabilization, the economy was dollarized and a Global Political Agreement (GPA) between the two main political parties was signed in September 2008. Inflation subsequently decreased and economic growth returned, although headwinds are evident¹.

Land and access to it has been a central policy focus throughout Zimbabwe's history. At Independence in 1979, the country had 33 million hectares of arable farm land, but about 45% of it was owned by fewer than 10,000 white farmers. As a part of Independence negotiations, the Lancaster House Agreement was signed on the 21st of December in 1979. The agreement outlined a process to redistribute land from white European Zimbabweans to blacks. Land reform officially began in 1980 and during the 1980s, land redistribution occurred on a willing buyer, willing seller basis. By the end of the 1980s, donors, who had provided the reserves for the purchase of lands, became weary and the pace of reforms slowed (Moyo, 2011). Unhappy with the pace of land reform and beginning in 2000, landless blacks (many of whom were veterans of the independence struggle) began to invade white-owned farms. As a response to these invasions, government began implementing a fast track land resettlement program. Government acquired most of the invaded farms and resettled the invaders. Subsequently, more than 3,100 farms were distributed among 214,340 black farmers (Mabaye, 2005). Our survey data sets show that in 2001, 2007, and 2011, 84%, 86% and 87%, respectively, of rural households owned a piece of land.

When economic conditions deteriorate, poorer households often send their children to work as a means of coping. Sending children to work instead of school leads to less human capital attainment and lower economic growth, as human capital is an important determinant of growth (Barro, 1991; Jacoby & Skoufias, 1997). Decisions about whether to send children to school or to work are affected by several factors. Many papers have argued that the main cause of child labor is poverty. Lack of resources, together with other factors such as credit constraints, income shocks, school quality, and parental atti-

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tudes toward education are all associated with child labor (Ersado, 2005; Jacoby & Skoufias, 1997; Weir, 2011). Additional explanations for child labor are presented by Cigno and Rosati (2005).

Ignoring rare cases of parents who do not feel benevolent toward their children, parents prefer not to send their children to work if they can afford not to. This axiom, proposed by Basu and Van (1998), is called the luxury axiom and is generally assumed in the literature on child labor. There is much evidence to support the luxury axiom (Basu, 1999; Basu & Tzannatos, 2003; Edmonds, 2005; Emerson & Souza, 2003; Ersado, 2005; Ray, 2000). But other evidences challenge the argument that poverty is the main cause of child labor. Bhalotra and Heady (2003) show that child labor increases with household land ownership in Ghana and Pakistan. Since land ownership is strongly correlated with household incomes and wealth in rural areas, they question the presumption that child labor is characteristic of the poorest households. Authors have dubbed this seeming anomaly “the wealth paradox” (see also Dumas, 2007; Duryea & Arends-Kuenning, 2003; Edmonds & Turk, 2004; Francavilla, Giannelli, & Grilli, 2013; Friebe, Leinyuy, & Seabright, 2015; Islam & Choe, 2013; Kambhampati & Rajan, 2006; Kruger, 2007; Sarkar & Sarkar, 2016).

The land/child labor relationship is complex. Land has two opposing effects (income and substitution) on child work and parental investments in human capital. On the one hand, the amount of land (or any other productive asset such as livestock, capital in a family enterprise, etc.) available to the household affects the productivity of the children and consequently affects incentives for putting children to work on the farm (substitution effect). In the absence of a smooth labor market, the productivity of a child laborer increases with landholding; therefore, demand for the child work raises. On the other hand, more land is associated with higher incomes, which decreases demand for child work and increases demand for schooling/leisure (income effect). Therefore, how child work changes with a household’s landholding is an empirical question. Does the income effect or the substitution effect dominate? Does one of the effects always dominate or is the pattern of the dominance nonlinear?

It may seem that an easy and efficient way to reduce poverty in rural areas is to give productive assets (agricultural capital) to poor people. Such a policy prescription assumes that the income effect dominates, but the literature has found important counter examples. For example, Cockburn and Dostie (2007) study theoretically and empirically the relationship between child labor and a wide range of child labor demand factors including household productive assets in the context of rural Ethiopia. They show that asset-based poverty reduction policies can provoke rural households to withdraw their children from school in order to work with the assets.

We show theoretically and empirically, using nationally representative household surveys from various years in Zimbabwe, that the relationship between child labor and a household’s land holding per capita is neither linear nor quadratic, but instead rather like a cubic function, with an upward bump in the middle of a generally downward-sloped relationship.

We theorize that the bump in the downward relationship between land holdings and child labor is caused by two factors, one associated with household preferences and the other with changes in productivity. First, the value of a child’s education (the disutility of putting children to work) increases with wealth. The wealthier the household, the more valuable is education of children. Second, holding household labor

fixed, when land size increases the marginal product of a child worker increases.

Following Basu, Das, and Dutta (2010), we assume that labor markets are quite imperfect. This assumption is justified because workers find it difficult and exhausting to work on others’ land, and employers may prefer not to hire non-family workers due to moral hazard and high supervision costs. Moreover, most parents feel apprehensive about sending their children to work in distant factories or farms due to security concerns (Foster & Rosenzweig, 1994, 2004; Jacoby, 1993; Jayaraj & Subramanian, 2007). In fact, the data show that only 0.96% of children work out of family across all three years in Zimbabwe.

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.

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