CHILD LABOUR IN A TRANSITION ECONOMY: EVIDENCE FROM ALBANIA

by

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ABSTRACT

Previous research on child labour has found that poverty increases the incidence of child labour. In this paper, I build and estimate a model of child labour which argues that a missing component in the previous findings is the existence of labour market imperfections. Its findings predict an ambiguous affect of land on child labour, which depends on the degree of substitutability between land and labour. Empirically, this paper tests the degree to which child labour then depends on the levels of land that these communities receive. Allowing the effect of land on child labour to be nonlinear, it was found that there is a risk on an increase in the incidence of child labour as the land reform progresses and more land is allocated to farm families. The results of this paper suggest that labour market imperfections may be significant enough to offset and even reverse the expected monotonically declining relationship between wealth and child labour.

Keywords: Child Labour, Imperfect Markets

Subject Terms: Labour Economics, Development Economics

EXECUTIVE SUMMARY

More recently, there have been studies focusing on the relationship between wealth and its effects on the incidence of child labour. In this paper, I build and estimate a model of child labour which argues that a missing component in the previous findings is the existence of labour market imperfections. This paper proposes a simple model of income maximization as a function of child labour, conditional on land and adult labour. Its findings predict an ambiguous affect of land on child labour, which depends on the degree of substitutability between land and labour. Empirically, this paper tests the degree to which child labour then depends on the levels of land that these communities receive. Allowing the effect of land on child labour to be nonlinear, it was found that there is a risk on an increase in the incidence of child labour as the land reform progresses and more land is allocated to farm families. However, not all communities will be affected in a similar fashion. In particular, communities comprised of poorer families will respond to the increase in landholdings with an increase in domestic child labour to satisfy the need for extra labour induced by land reform. Conversely, in communities with average landholdings above a threshold level, will have a lower incidence of child labour with increased landholdings. This suggests that labour market imperfections may be significant enough to offset and even reverse the expected monotonically declining relationship between wealth and child labour. Therefore, when hiring labour is not feasible either because labour is not available or because the family cannot afford to hire labour, the family may be forced to resort to second-best resource allocations involving child labour.

DEDICATION

I would like to express my profound, humble and gracious thanks to my family, for their love, guidance and encouragement. I thank my parents for instilling in me the value of an education. Thank you for allowing me to stray from the flock on occasion and find my own way. Thank you for supporting me throughout. Dad, thank you for the belief to continue and the imagination to progress this far in my career. Thanks to Darrin who, by example, taught me to not only "talk" about great things but to "do" great things as well, and to leave a positive legacy. I expect injustice will continue to motivate me throughout my lifetime and this is because of you. I would especially like to thank my mom for being the best role model a mother, a woman, a person can be. There are no words to express how I feel about what you have done for me. None of this, absolutely none of it would be possible without you! Oh and Jon, thanks for helping me through it all.

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

I. Introduction

For poor countries, and international financial institutions lending credit to these countries, work done by children, which contributes to GDP directly, is desirable. However, if history were any guide, we would expect that as economies grow and as returns to education rise, children would gradually leave work for school. Indeed, according to the International Labour Organization (ILO), few children are working today in developed countries and within the last three decades the participation of children in the labour markets in Asia and Latin America has fallen to 10% of that in 1960.[1]

The strong negative relationship between economic growth and the withdrawal of children from the labour markets may suggest that the problem of working children will eventually take care of itself. However, there are several immediate reasons for being concerned about children working, rather than letting the problem disappear over time. ILO claims in its 2005 *Child Labour Fact Sheet* that the net economic benefit of eliminating child labour throughout the world is estimated at a total of $4.3 trillion over the period of 2000 to 2020. The benefits from an increase in productivity due to increased education and improved health are estimated to exceed the cost of eliminating child labour by a ratio of 7 to 1.[2]

Children have a limited amount of time that, broadly speaking, can be allocated to three kinds of activities: school, work, or leisure. The more time children spend working, the less is available for their education, reducing a developing region's human capital accumulation. Depending on the nature of the work, children can also be exposed to dangers to their physical and mental development. Despite the pervasive nature of poverty and child labour, we have a limited understanding of the factors that lead to child labour.

The purpose of this paper is to explain results of several recent empirical studies[3], which surprisingly find that, on average, children in asset/land abundant households, are in fact *more likely* to work than children in less land abundant households. These studies

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[1] International Labour Organization, 2005 *Child Labour Fact Sheet*
[2] Ibid.
[3] See Bhalotra and Heady (2003), Beegle, Dehejia, and Gatti (2003) , Edmonds and Pavcnik (2005), Hoyman and Kimhi (2005) and more

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find that agrarian societies like those seen in most developing countries challenge the commonly held understanding that child labour should be more common in (land) poor households.[4]

If one is serious about reducing the incidence of child labour, it must be examined at its primary source. With the introduction of child labour laws, the main source of child labour can be found at the child's home, on the family farm.[5] Previous theoretical and empirical studies on child labour are not well equipped to explain this emerging phenomenon due to lack of sufficient data and unrealistic assumptions regarding labour markets in developing countries.

In contrast, this paper emphasizes the impact of labour and land market imperfections on child labour. It contributes to previous literature by using data from Albania, an Eastern European transition country, which helps reveal the effects of land reforms and government policy, while explicitly introducing labour market imperfections in modelling child labour. Lack of strong trade unions, independence of employers and state, and lack of experience in market behaviour among workers result in employers setting wage levels different from the equilibrium wage that would result in a complete markets, full information environment. Such characteristics make transition economies typical examples of economies with imperfect labour markets.

When land transactions are institutionally limited, and when hiring labour is not feasible either because labour is not available or because the family cannot afford to hire labour, the family is forced to resort to second-best resource allocations involving child labour. We see in the results section of this paper that many families are substituting future well-being for current income and consumption through increasing the incidence of child labour with the introduction of land reform.

Theoretically, ownership of productive assets such as land influences child labour. First, there is the standard wealth effect whereby landholdings that are more valuable generate higher income, making it easier for the household to forego the income that

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[4] See Basu, Kaushik, and Pham Van (1998).

[4] See ILO *2004 Child Labour Fact Sheet.* Date accessed August 18, 2007 at http://www.ilo.org/dyn/declaris/DECLARATIONWEB.DOWNLOAD_BLOB?Var_DocumentID=6215

child work would bring. Working against this effect is the fact that the marginal product of labour is greater the larger is the stock of productive assets. This raises the return to child labour and thereby encourages it. If labour markets are perfect and the land-owning household could both hire and effectively monitor workers, then this incentive effect would disappear. The previously mentioned effects in turn, depend upon the structure of inheritance norms and the degree of development of land markets.

Large survey data sets on household behaviour have only recently become available, but many of the studies that employ them use household income, consumption, or productive assets variables as their variable of interest.[6] The effects of productive assets on child labour will contain the income and substitution effects. Since data collection in developing countries is particularly difficult, available studies have tended to use paid work for outside employers to represent child labour. The inclusion of domestic child work, paid child work, and child school attendance will push results of this paper's estimation past the usual child labour studies.

Motivated to separate the wealth effect from the substitution effect of land size on child labour, my empirical model departs from most specifications in the existing literature by including both land value and a measure of permanent income. However, the explanatory variables of interest remain plot size and plot size squared in order to determine the relationship between child labour and household landholdings. In addition, my data provides a measure of privatization, enabling me to explore the effects on government policy on child labour in Albanian villages.

In order to study the relationship between landholdings, child labour and poverty, I first examine the existing literature on the subject in Section II. In Section III, I construct a simple theoretical model, which includes all-important factors, such as labour market imperfections, landholdings, and the influence of home production on child labour. In Section IV, I describe my estimation technique and identify and correct some shortcomings in past empirical works. In addition, I provide institutional details of the surveyed area, highlighting the factors that shape a unique, previously unexplored testing ground. Section V concludes.

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[6] See Nkamleu, and Kielland (2006), Rosati, and Rossi (2003), Bando, Lopez-Calva, and Patrinos (2005), Cockburn (2000).

II. Related Literature

Basu and Van (1998) and Basu (1999) were the first to model the relationship between subsistence poverty and child labour. Their model predicts that households whose per capita income is above the subsistence level can afford leisure for their children. There are then two stable equilibria, a low-wage equilibrium characterized by child labour and a high- wage equilibrium in which children are all attending school. Depending on the productivity of the economy, there may be multiple equilibria in between a "bad equilibrium" or a "good equilibrium," but none will be sustainable. These papers were seminal in their contribution to defining the role of poverty and the effects of policies on child labour in developing nations. Various authors have taken the idea of child labour determinants in other directions such as the adverse effects of imperfect credit markets (Ranjan, 1999; Lahiri and Jafarey, 1999), generational commitment issues (Baland and Robinson, 2000), or fertility driven participation models (Eswaran, 2000 and Cigno and Rosati, 2000).

Narrowing the literature to those who have modelled child labour in the agrarian household, Strauss (1986) and Benjamin (1992) are among the main contributions. However, their models depend on the assumption of a perfect labour market. The authors built upon the idea that consumption and production decisions are separable, making the total labour usage on a household's farm independent of the member's consumption. Cockburn (2000) contributed to the understanding of child labour by making it a function of land and other assets.[7] He used a variety of asset variables to see their effects on child labour in Ethiopia. He concludes that some assets (i.e. land) induce child labour while other assets (i.e. livestock) reduce it. Unfortunately, Cockburn does not attend to the potential influences of these productive assets since he does not include controls for household income.[8] The resulting coefficients of his regressions are therefore a combination of the income and substitution effects.

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[7] Cockburn (2000) hypothesizes that land ownership will create both wage and wealth effects on child labour, without acknowledging the effects of imperfect labour markets.

[8] Interpretation of Cockburn's results is further limited by the fact that he enters assets in terms of number of items (e.g. number of livestock) rather than in terms of their value. The fact that a cow is likely to be more valuable (or income producing) than a plough is hence not allowed for.

Most related to this to this paper is the Bhalotra and Heady (2003) study of Ghana and Pakistan. The authors focus on the relationship between farm size or initial wealth and children's work hours. Household expenditure on food is used as a proxy for income, and instrumented with the community level wage rate and infrastructure. Since child labour contributes to household income, food consumption (which proxies permanent income) is potentially endogenous. Even if child income could be observed, the endogeneity problem would not be resolved by subtracting child labour income from total income since the labour supply of different household members is likely to be jointly determined. Therefore, the authors instrument household consumption using the cluster (community) level wage rate for men in agricultural work, as well as various indicators of the level of infrastructural development of the community.[9] The evidence presented is conflicting. An increase in farmland is associated with an increased probability of work by girls in Ghana and boys in Pakistan, but not among boys in Ghana and girls in Pakistan.

To build on the Bhalotra and Heady paper, the proposed model focuses strictly on the effects of wealth (land) on child labour in an economy with imperfect labour market. The theoretical results can be used to analyze the impact of land reform policies as well as the existence of possible "turning points" in assets, beyond which a further increase in landholdings leads to a decrease in child labour. In addition, the household survey data used enables me to include the perceived levels of household wealth instead of the imperfect consumption proxy used in the previous papers, enhancing the precision of my results.

The use of data from a transition country not only provides the proper institutional settings that contribute to labour market imperfections that allow me to test the models predictions, it also provides a unique opportunity to examine the phenomenon of child labour in communities where the key component of household assets, or land, changes unexpectedly. To the best of my knowledge, only one other paper has focused on the effects of land reforms in transition countries on child labour.

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[9] These instruments are attempting to capture the initial wealth effects only while isolating the effects of the child's marginal productivity on the household's desire for child labour participation. Unfortunately, the use of adult wages as an instrument indicates the assumption of perfect labour markets and the ability for children to compete with adults in the labour market.

Kimhi (2007) takes household survey data from four regions in Georgia and estimates the effect of land holdings on child labour. He uses a probit model to determine the probability of an increase in child labour with the increase of family land. Kimhi's study only allows him to test the relationship between demand for child labour and the increases in landholding size, without the additional control of household income. A more robust estimation approach such as the one pursued in the current paper would account for the effects of the *value* of land (wealth effect), as well as land acquisitions through privatization. The inclusion of a privatization variable allows a direct connection between land reforms and their influence on child labour.

III. Theory

As explained in the introduction, most of the existing literature would conclude that the primary cause of child labour is poverty. When modelling child labour, economists have recognized that parents do not like to send their children to work if they can afford not to. This hypothesis is called the 'luxury axiom', and much of the earlier work on child labour is based on this assumption.[10] However, the facts that land is usually strongly correlated with household income and that in the data we often see households with more land exhibit higher rates of child labour seem to challenge the hypothesis that child labour is caused by poverty.

The model in this paper combines the original 'luxury axiom' idea with the notion of imperfect labour markets. In developing economies, poor households may want to send their children to work in order to escape extreme poverty. However, parents will find that it is nearly impossible to do so simply because they have no access to labour markets close to home or labour markets do not operate efficiently for various institutional or asymmetric information reasons. In such an environment, when a household acquires additional land (e.g. through a land reform), the opportunity for children to work on family land present themselves. However, if the household's land-holdings continue to rise, they can reach a point where the household will have enough wealth to discontinue their children's work. Next, I formalize this basic mechanism.

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[10] Basu and Van (1998), Basu (1999), Ray (2000), Edmonds and Pavcnik (2005), Edmonds (2005) and many more.

My model is a simplified version of that used by Bhalotra and Heady (2003) as I explore only the impacts of land and imperfect labour markets on child labour.[11] As per the "luxury axiom", the model treats non-working children as a luxury good. Therefore, if a household's income were extremely low, they would never consider consuming child leisure. Assume that the household starts with l units of initial wealth – or to fit with the empirical portion of this paper, land. With a perfectly functioning labour market, the model implies that as l rises, child labour market participation falls. However, in the presence of labour market imperfections I demonstrate that as l rises, child labour can rise as well.

More specifically, assume that each household is endowed with the utility function,

$$U = u(c,s) \quad (1)$$

Where c is household's consumption and s $\epsilon[0,1]$ is the share of work done by household's children.

Each household contains one adult who supplies one unit of labour inelastically. Building the luxury axiom into (1) and to simplify the analysis, I impose quasi-linear utility:

$$U = u(c) - \alpha s \quad (2)$$

where $u'(c) > 0$ and $u''(c) < 0$ for all c and $\alpha > 0$ is a parameter determining the cost of child labour to the family. The linear cost term is consistent with Basu and Van's (1998) model.

It is easy to show that, in the above framework, if household's income doubles then child leisure, 1-s, will more than double. This makes a non-working child a luxury good consistent with the Basu and Van's (1998) model.[12]

III.A Perfect Labour Market

A perfect labour market is characterized by a single market wage w taken as given by each household. The household can choose to buy or sell as much labour as

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[11] Bhalotra and Heady is a 2-period model contains parameters for imperfect labour markets, imperfect credit markets, and school attendance.

[12] See Basu and Van 1998, "Economics of Child Labour", pp.5-7. Date accessed July 23, 2007 http://tinyurl.com/25ra9y.

they want at that wage. For simplicity, assume that the wages for adults and children are the same.

Suppose a household owns l units of land and there is a perfect labour market. Assume the production function for domestic output is $y = f(l, L)$ where $f_l > 0$. The household's profit function (given l and w) is

$$\pi(l, w) = \underset{L}{Max} \ f(l, L) - Lw$$

The optimal level of labour $L^*(l, w)$ solves the first order condition with respect to labour i.e. equalizes the marginal product to the marginal cost of labour:

$$f_L(l, L) = w$$

Thus, maximized profit is

$$\pi(l, w) = f(l, L^*(l, w)) - L^*(l, w)w$$

By the envelope theorem, $\pi_l(l, w) = f_l > 0$ meaning that profits increase in land.

Note that if the household supplies s units of child labour into the perfect labour market, its budget constraint reflects the independence between labour usage on the farm and household consumption:

$$c = \pi(l, w) + w(1) + ws \qquad (3)$$

Using (2) and (3) the household's maximization problem becomes:

$$\underset{s}{Max} \ u(\pi(l, w) + w + sw) - \alpha s$$

This yields a first order condition equal to:

$$u'(\pi(l, w) + w + ws)w - \alpha = 0$$

$$or,$$

$$u'(\pi(l, w) + w + ws) = \frac{\alpha}{w}$$

Taking the total differential of the first order condition with respect to landholdings, l yields,

$$u''(\pi(l, w) + w + sw)(\pi_l(l, w) + w\frac{\partial s}{\partial l}) = 0$$

Rearranging the above and using u" > 0, we find,

$$\frac{\partial s}{\partial l} = -\frac{\pi_l(l, w)}{w}$$

As stated before, since $\pi_l(l, w) > 0$ and wages are always positive, the above inequality implies that as landholdings, l increase, optimal child labour, s falls. This is consistent with the Basu and Van (1998) "luxury axiom" result.

However, as Bhalotra and Heady (2003) point out[13], the above logic is dated, and the assumption of a perfect labour market is questionable in developing economy settings. In the next section I extend and modify the model to incorporate the imperfect labour markets that are found in most developing countries.

III.B Imperfect Labour Market

To simplify things, I assume an extreme form of imperfect labour market – no labour market.[14] A few crucial elements of the previous model have to change in order to represent this imperfect market environment. First, I replace L with $s+1$ in the production function because, without a functioning labour market, all labour will be supplied domestically. Clearly, imperfect labour markets will produce inefficiencies through either too little or too much labour applied, and will eliminate the extra wage income for the household.

Specifically, the production function now becomes:

$$y = f(l, s + 1) \qquad (4)$$

where y is domestic output produced, l is land owned by the household and $s + 1$ is the total amount of labour used (s from children, 1 from adults). Furthermore, assume that:

(1) $f_l, f_s > 0$

(2) $f_{ll}, f_{ss} <= 0$

(3) $f_{ls} > 0$

Since there is no labour market and the wage income associated with it, the household consumes what it produces, $c = y$.

Combining equations (2) and (4) the household's maximization problem becomes,

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[13] See Bhalotra and Heady (2003), pp.12-15.

[14] Lack of experience, stable institutions, and full information creates discrepancies between wages offered by employers in transition countries and those wages that would normally be offered in traditional market economies.

$$\underset{s}{Max} \ u(f(l,s+1)) - \alpha s \qquad (5)$$

The first order condition is

$$u'(f(l,s+1)f_s - \alpha = 0$$

$$or,$$

$$c = y = f(l,s+1)$$

$$so,$$

$$u'(c)f_s = \alpha \qquad (6)$$

Again, taking the total differential of (6) with respect to l we have,

$$F_l = \left(u''(l,s+1)\frac{\partial f_{l,s}}{\partial f_l} \right) f_s + u'(l,s+1)\frac{\partial f_s}{\partial f_l}$$

$$F_s = \left(u''(l,s+1)\frac{\partial f_{l,s}}{\partial f_s} \right) f_s + u'(l,s+1)\frac{\partial f_s}{\partial f_s}$$

$$\frac{ds}{dl} = -\frac{F_l}{F_s} = -\frac{f_s u''(c)f_l + u'(c)f_{sl}}{f_s^2 u''(c) + u'(c)f_{ss}} \qquad (7)$$

From (7) we see that, given our assumptions on u and f, the denominator is always negative, making the sign of $\frac{ds}{dl}$ dependent on the sign of $[f_s f_l u''(c) + f_{sl} u'(c)]$, a negative number plus a positive number. Thus, the numerator can change sign depending on the parameters and the levels of the variables l and s which makes the relationship between child labour and land ambiguous. This reveals an ambiguous relationship between child labour and landholdings. This is a testable hypothesis of the imperfect labour market model that will be evaluated in the empirical section IV against the hypothesis of a strictly decreasing relationship between land and child labour from section III.I.

More precise results can be derived from equations *(6)* and *(7)* by taking equation *(6)*, and knowing that, given any level of l, say l^*, the household will chose s so that,

$$u'(c) = \frac{\alpha}{f_s}.$$

Let the optimum s be s^*. Now, suppose the wealth of the household, l increases. Since $f_l > 0$, the increase in wealth results in an increase in output, y and consumption, c. The increased level of c lowers $u'(c)$; the extent of which depends on the concavity of u. However, given $f_{sl} > 0$, the higher the level of l the more f_s will increase, therefore lowering $\dfrac{\alpha}{f_s}$. The extent of the increase in f_s thus depends on the value of f_{sl} - i.e. the degree of complementarity between land and labour in the production function.

To sum up the findings from this section; the effect of an increase in household wealth on child labour depends, in general, upon both the properties (slope and curvature) of the utility function and the degree of input complementarity in production f_{sl}. For instance, if child labour is highly substitutable with land (f_{sl} is large), then an increase in the land assets would decrease child labour.

Now that the model of child labour has established a general relationship between landholding and child labour share for both the cases of perfect and imperfect labour markets, the next section tests this relationship empirically using a unique data set from a transition economy (Albania). The precise nature of the relationship between these two variables and our ability to distinguish the two model cases will be revealed by the data.[15] The above model provides an empirically testable proposition: in the presence of imperfect labour markets, as household's land ownership rises child labour participation will not always decrease unlike in the perfect markets case.

IV. Estimation

IV.A Institutional Details

Albania had one of the worst dictatorships in Eastern Europe making it an extremely closed regime until 1990. Today, the economic situation in Albania remains highly fragile, arguably making it Europe's poorest country. The Albanian Statistical Institute reports that 25% of the country's population lives below the poverty threshold

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[15]See Appendix for potential shapes of child labour share with respect to landholdings

and 5% live in extreme poverty.[16] Of its 3.1 million inhabitants, Albanian children comprise a large proportion; with some 33% of the population under 15 and 40% under 18.[17] Rising poverty is changing some parents' priorities from schooling to contributing to family income, despite Albanians' historical and cultural tradition of placing children's education at the centre of family concerns. According to Albania's 2004 Child Labour Statistics, 32% of children aged 6 to 17 work.[18] Agriculture remains the leading sector in the Albanian economy, yielding around 50% of the gross national product in 2004.[19] Naturally, farming is the sector in which child labour occurs most frequently in Albania. Combining all these factors, the risk of an increased incidence of child labour as a result of the land reforms (land restitution and privatization) implemented after the fall of communism seems inevitable.

In most Eastern European transition economies, the introduction of a market-based economy and the redistribution of land property rights after 1990 presents an interesting setting for studying child labour. Intuitively, child workers may become more commonplace due to the increase in the demand for labour by poor farm households who obtained land through the reforms. Conversely, the positive wealth effect of the market reforms could increase the incentives (and means) for investment in human capital and drive child labour participation in the opposite direction. Combining these two possible outcomes, the effect of the reforms is theoretically ambiguous and evaluating its sign becomes an empirical question.

When former communist countries began their transition to a market economy, land was transferred from state-run to family-owned farms. In the case of Albania, the land that was allocated to farming families is rarely transferred between farming households because of the inefficient markets in place for land transactions.[20] In addition, as a rule, poor transition countries have imperfect labour and credit markets.

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[16] Samuel Grumiau (2004). "Child Labour in Albania", *A Report for the International Confederation of Free Trade Unions* page 3. Date accessed, August 17, 2007 at http://www.icftu.org/www/PDF/AlbaniareportEN.pdf

[17] Ibid.

[18] "Eradicating the worst forms of child labour: Guide to the implementation of reform ILO Convention 182" This report is the result of works undertaken by NGO's, ILO-IPEC, UNICEF, etc. in 2004.

[19] Ibid, page 15.

[20] See Swain (2001), Rosenzweig and Wolpin (1985), and Gogodze, Kan and Kimhi (2007)

As in many transition countries, the incomplete nature of Albania's land reforms has left land markets far from perfect (Gogodze, Kan, and Kimhi 2007). In addition, the empirical evidence clearly indicates that rural labour markets in countries similar to Albania are not functioning perfectly (Hoyman and Kimhi, 2005). Hence, I will assume in this paper that land and labour markets are imperfect. I will also assume that child labour comes, at least in part, at the expense of human capital investments. In the rest of this paper, I will empirically explore the above issues and their effects on Albanian child labour testing the theoretical models from section III.

IV.B Data

The data used in this paper comes from the Albanian Living Standards Measurement Survey (LSMS) carried out in 2002 in 288 different communities for 5,760 households. The household survey questionnaire includes questions on the demographic profile of the household, land area and value, land acquisition methods, household education, household income, and social aspects. All household data is averaged over the communities.

For children younger than 15 years of age, the survey does not document the allocation of time. It only provides the frequencies of children working with parents (table 1), child labour participation in paid labour (table 2), and children not going to school (table 3). For the purposes of testing the model hypothesis on the effect of imperfect labour markets on domestic child labour, the dependent variable in the main regressions will be the level of children working with parents (childwparents).

Table 1
Frequency of Children Working With Parents Variable

Where the Children are Working	Frequency
Working with Parents	3694
Work Elsewhere	546

Table 2
Frequency of Children Working for Pay Variable

The Number of Children Working	Frequency
Most of Them	880
More Than Half	375
Less Than Half	160
Very Few of Them	40
None of Them	212

Table 3
Frequency of Children Not Going to School Variable

The Portion of Children Going to School	Frequency
None at All	487
Attend School Part Time	2460
Attend School Regularly	1020

Schooling is the primary activity of 26% of the children. Even though over half of the children attend school, the percentage of children working remains high at around 87%, suggesting that many of the children participate in both school and work. The dominant type of work is work on the family farm (at 95%) which is consistent with previous studies (Bhalotra and Heady, 2003).

IV.C Estimation Methodology

Domestic child labour (childwparent) is the main dependent variable in the regression analysis below, and will be analyzed using the number of children working with their parents. Unfortunately, these variables are only measured at the community level. Further, the community survey was answered by a community leader, who was asked to identify the characteristic that most described the number of children involved in child labour. In order to determine the increase in domestic labour, I combined the communities who ranked most of their children as "not working" or "working elsewhere". I use a maximum likelihood logit model to estimate the probabilities of the children in a community increasing/decreasing domestic work with parents.

In my binary estimation method, let the dependent variable, Y_c be the probability of children working with parents in the cth community. Supply characteristics of child

labour were collected at the individual level[21], while demand characteristics of child labour were collected at the household level.[22] Ideally, this regression would be performed at the household level. Unfortunately, the dependent variable is only measured at the community level. Therefore, both the child and household variables are averaged over community, making them community characteristics. Community level characteristics are also likely to affect the demand side and supply side incidence of child labour.[23] The vectors of the independent variables of interest are labelled X_c (land) and X_c^2 (land squared). All variables in the vector Z_c are used as controls; child's age, household income, household size, household education level, and rural/urban dummy. The main regression equation estimated in this paper then looks like

$$Y_c = \beta_0 + \beta_1 X_c + \beta_2 X_c^2 + \beta_3 Z_c + \varepsilon_c$$

The equation above contains a measure of the average age of children in the household of each community (the average of the average). Further, the estimation equation includes measures of plot size, household income levels, household size, and household education that were aggregated over household and averaged over the community. The results of the estimation represent the effects on the community levels of child labour caused by the average levels of household and individual characteristics. Consistent with my theoretical model, the focus would be on the effect of community landholdings, (i.e. the average landholdings per household) on the community's domestic child labour participation.

In my first estimation exercise, landholdings and landholdings squared serve as the primary explanatory variables. These variables measure the pure effect of an increase in landholdings on child labour in the community. The inclusion of a quadratic term allows for nonlinearities, consistent with the imperfect market model. Child age (*Age*) is included as a control for child characteristic effects on child labour.

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[21] The child characteristic used in this estimation is the child's age.

[22] The household characteristics used in this estimation are log plot size, log plot size squared, household income, household size, average household education.

[23] The community level characteristics are the rural/urban dummy. I cannot use community fixed effects with the data at community level, the degrees of freedom would be too high.

15

I also control for the levels of education of all household members. In the previous literature, researchers normally include education of parents and/or head of household. Since my estimation is at the community level, I have created a variable equal to the average level of education of households averaged over the community (*Highest Schooling*). I prefer to control for education of all household members because, if there is an income effect associated with education, it is not only that of the child's parents. In addition, the education of older siblings may indicate, for example, some common tendency towards education within the household.

A further control for the income effect on the incidence of child labour is household income (*Household Income*). In the regressions this measure of household income is averaged over the community, making it an average measure of community wealth. Another household control used in this estimation is a household size variable. It was created by summing the members included in the household and averaging the household size across the community (*Household Size*).

In a second estimation exercise I use the same control variables, but a different independent variable of interest, namely plot area is replaced by plot value. This new measure controls for the effects of the value of land acquired, making it a more accurate measure for testing the "luxury axiom," which assumes that if household assets increase, child labour will decrease. The plot value variable also allows me to test the impact of an increase in land assets on child labour in a community with imperfect labour markets. The results of both estimations are crucial in the study of the effects of land reform in countries with imperfect labour markets on child labour.

Finally, in addition to the two main specifications described above, the results of two supplementary estimation exercises are provided in the appendix for robustness. Specifically, I have re-estimated the data using two other dependent variables - the frequency of children working for pay (*Childpay*) and the frequency of children who do not attend school (*Noschool*). The results of these regressions are found in, tables A1 and A2 respectively.

The summaries of all variables used in the estimation are displayed in Table 4 (for all variables after aggregated at community level) and Table 5 (variable summaries before aggregation to the community level).

Table 4
Description of Variables after Collapsing (Mean) by Community

Variable	Obs.	Mean	Std. Dev.	Min	Max
Childwparent	280	4.13	0.60	3	5
Childpay	280	1.52	1.04	1	5
Noschool	280	2.84	0.70	1	9
Mean Plot Area	280	2286	1725.9	50	10000
Mean Plot Area Sq.	280	8205608	1.37e+07	2500	1.00e+08
Mean Plot Value	280	1369.4	3309.8	5	36635.5
Mean Plot Value Sq.	280	1.28e+07	9.32e+07	25	1.34e+09
Age (average years)	280	5.65	1.30	1	10.5
Privatization	280	1.48	1.05	1.35	1.66
Household Size (average household)	280	5.48	0.99	2.25	9.4
Household Income (average household)	280	2.56	0.62	1	8
Highest Schooling (average household)	280	1.70	1.10	1	6
Rural	280	16.23	7.82	1	2

Table 5
Description of Variables at the Household Level

Variable	Obs.	Mean	Std. Dev.	Min	Max
Household Size	16521	1	0.50	1	1
Age	3697	5.48	3.59	0	15
Highest Schooling	12922	1.75	1.33	0	6

IV.D Results

The estimation results are presented in Table 6 for the regression with plot area as the explanatory variable and in Table 7 for the regression with land assets (Plot Value) as the explanatory variable.

The first column of each table displays the logit estimation results, followed by the odds ratios. The third column displays the results of the regression with the inclusion of a privatization variable that measures the amount of land in the community that has been acquired through privatization land reforms. The fourth column presents the results

of the pure regression that only includes the land and land squared measures in meters, to directly test the theoretical results from section III.

Table 6
Dependent Variable: Children Working with Parents

Variable	(1) Logit	(2) Odds Ratio	(3) Privatization (Odds Ratio)	(4) Model Specification
Log Mean Plot Area	7.150***	114.137***	120.470***	6.520***
	(0.746)	(851.138)	(9.758)	(0.553)
Log Mean Plot Area	-0.534***	0.588***	-10.029***	-0.447***
(Squared)	(0.057)	(0.033)	(0.823)	(0.040)
Privatization	No	No	1.070***	
(Mean)			(0.150)	
Age	0.428***	1.588***	1.676***	
(Mean)	(0.903)	(0.181)	(0.173)	
Household Size	4.253***	36.987***	1.273***	
(Mean)	(0.433)	(16.542)	(0.164)	
Household Income	-1.381***	0.326***	-0.752***	
(Mean)	(0.147)	(0.046)	(0.194)	
Highest Schooling	-1.381***	0.251***	0.191	
(Mean)	(0.355)	(0.076)	(0.407)	
Rural	2.318***	10.998***	5.272***	
	(0.247)	(2.681)	(0.489)	
Intercept	-32.312***			-20.003***
	(2.667)			(1.827)
Observations	280	280	280	280
Pseudo R-Squared	0.4000	0.4000	0.4104	0.115

Note: Standard errors are in parentheses. *** indicates significance at 1%; ** at 5%; and, * at 10%.

Landholdings (Mean Plot Area) have a statistically significant quadratic effect on the probability of children working with parents. As previously predicted, we see from column 1 that if ownership of plot area is increased by one unit, the log odds of an

increase in domestic child labour is $b_1 = 7.15$. However, the "one unit increase" in the plot size variable is really the average of the average plot area, which is 2286^{24} meters squared, a log value of 7.73. Basically, the logistic coefficient is interpreted as the change in the log odds of child labour if the log increases from 7.73 to 8.83, but this is a huge increase in land areas, going from 2286 to 4230 meters squared. To translate this increase into something truly marginal, I have calculated the increase in the log odds of child labour to be 0.36 if plot size increases by $100\,m^2$.[25] Even with the smaller increases in landholdings, this result supports the hypothesis that in the presence of imperfect labour markets, child labour will increase with landholdings. To help interpret the magnitude of the effect of the logit coefficient in column (1), column (2) provides the odds ratio coefficient, which states that a unit increase in landholdings will increase the probability the child will work with their parent's by 114 times. So, contrary to what the luxury axiom and the perfect labour market model predict, I find that in transition countries with imperfect markets, an increase in landholdings leads to an *increase* in child labour. The coefficient on Mean Plot Area Squared is telling us that this effect is decreasing at a rate of 0.6 times. This is consistent with the findings of Basu and Van (1998) and may support the luxury axiom, after an inflection point.

I explore this further in Figure 1 where we see that for communities with a large proportion of land-rich households, the probability of domestic child labour decreases monotonically with landholdings. Figure 1 illustrates the interaction between plot area and the probable increase of children working with their parents. Plotting the data's predictions clearly demonstrates an inverted-u shaped curve, where child labour will increase with the increase of landholdings at smaller initial ownership of land. One explanation for this is the presence of imperfect markets, more specifically imperfect land and labour markets. Additional support for the imperfect market hypothesis comes from the privatization variable that predicts a 1.07 times increase in the probability of domestic child labour for every unit increase in land acquisition through land reform during

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[24] The average of the average household landholdings in the community can be seen in table 4.

[25] To find the change associated with the smaller unit increase I used the equation Ln (2286 + 100) = 7.78, Then I took the difference between the marginal increased log and the average log (7.73). This difference can then be multiplied to the coefficient (7.15). The result is 0.34, the change in the log odds of child labour if the land increased in units of $100\,m^2$.

privatization.[26] Since this variable is the closest link to government policies and their effects on child labour, it is a very important addition to the previous literature.

Figure 1
Change in probability of child working with parent as a function of squared metres of land

Child Working with Parents as a Function of Landholdings
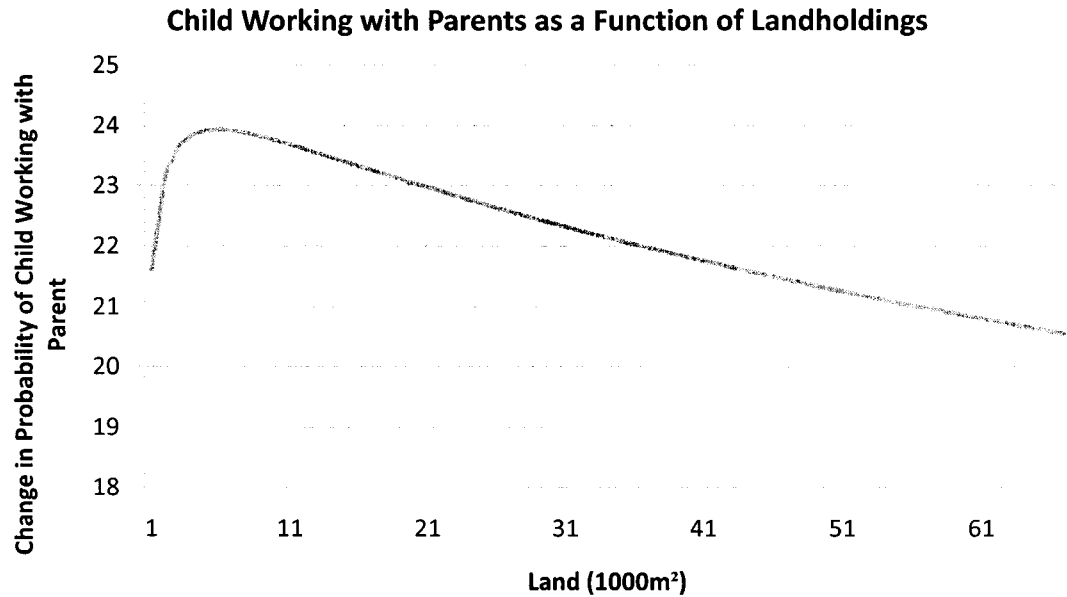
Additional interesting implications can be derived from the coefficients of the other independent variables. For example, in communities with larger families, the household size variable can be a large number. This variable can represent household circumstances within the community. If a higher number of people live within the household, the more dependents there are for the household to support, making an increase in this variable representative of an average decrease in the living standards of the community. If this is the case, the positive and significant coefficient found in the regressions suggests that there is an increased incidence of child labour if households contain more members, which may be a result of its poverty status. This is consistent with the predictions of the luxury axiom in the sense that in poor households, families will engage their children in work.

In each case the income effect of an increase in landholdings, captured by the *household income* variable, is prominent and significant, and leads to a decrease in the

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[26] See section IV.1 for further discussion on transition into privatization leading to imperfect markets

probability of child labour. Conversely, the effect of being in a rural area has a highly significant and positive effect on the probability of child labour.

The second important estimation exercise I perform uses plot value measured in Albanian currency instead of plot area in meters squared as the independent variable of interest. These regression results seem to reveal a different pattern of child labour participation. In the first column of table 6, we see that Log Mean Plot Value has a significantly *negative* coefficient confirming that as plot value increases, children begin to work away from the farm. This could be due to the higher productivity of smaller plots,[27] decreasing the demand for farm labour and freeing children to participate in labour markets elsewhere or attend school.[28] Results from this regression show that when plot value is used and thus the value of land is controlled for (in addition to pure land size), then the probability of child labour decreases for households with landholdings of higher value. This is an important finding, which suggests that both the productivity effect (through land size) and the wealth effect (through land value) are crucial in shaping the overall incidence of child labour. Studies that omit one of those effects are likely to have biased findings.

Table 7 suggests that the luxury axiom overrides the imperfect labour markets in households with higher incomes. In column (2), we see that if land assets increase by one unit, then domestic child labour will decrease 20 fold.

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[27] Asuncao, J. and M. Ghatak (2003) "Can Unobserved Heterogeneity in Farmer Ability Explain the Inverse Relationship between Farm Size and Productivity?", *Economics Letters*

[28] See Appendix table A5 for results on the effects of plot value on children's school attendance and on a child's participation in paid labour

Table 7
Dependent Variable: Children Working with Parents

Variable	(1) Logit	(2) Odds Ratio	(4) Model Specification
Log Mean Plot Value	-1.544**	20.013**	-0.928**
	(0.515)	(1.110)	(0.408)
Log Mean Plot Value	-0.110**	1.116**	0.066**
(Squared)	(0.039)	(0.043)	(0.031)
Age	0.615 ***	1.850***	
(Mean)	(0.086)	(0.160)	
Household Size	1.249***	3.487***	
(Mean)	(0.116)	(0.406)	
Household Income	-0.581***	0.559***	
(Mean)	(0.136)	(0.076)	
Highest Schooling	-0.011	1.011	
(Mean)	(0.285)	(0.289)	
Rural	2.587***	13.300***	
	(0.236)	(3.143)	
Intercept	-3.456*		6.296***
	(1.824)		(1.289)
Observations	280	280	280
Pseudo R-Squared	0.3277	0.3277	0.0460

Note: Standard errors are in parentheses. *** indicates significance at 1%; ** at 5%; and, * at 10%.

Similarly to fig. 1, figure 2 illustrates the interaction of domestic child labour and land value, plotting the probability of children working with their parents as a function of land value in Albanian currency (leke). We see that in communities richer with land assets, the luxury axiom is the only effect on child labour (since parents can now afford to the luxury of child leisure), making the relationship between land assets and the probability of child labour unambiguously negative. This finding is consistent with the predicted results of the Basu and Van (1998) model. An increase in land value captures the positive wealth effect associated with landholdings only, allowing households to substitute out of child labour, the inferior good.

Figure 2
Change in probability of child working with parent as a function of land value in increments of 1000 Albanian leke

Child Working with Parents as a Function of Land Value
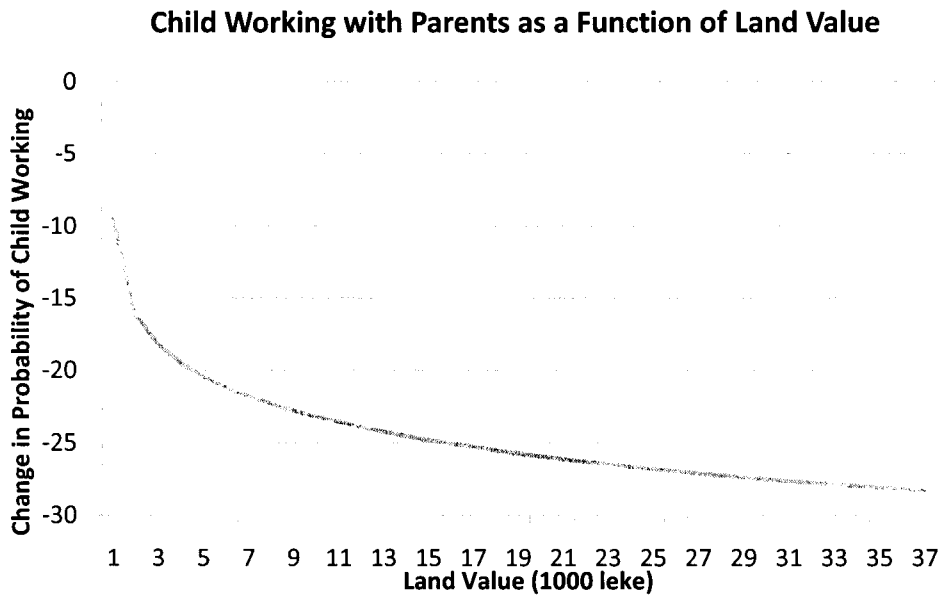
In summary, the results of the empirical analysis performed in this section establish the influence of imperfect labour markets on domestic child labour participation in a community. If treated in isolation, the increase in land assets will decrease the incidence of child labour due to the increase in wealth it provides the households. However, a realistic developing country market will have imperfect characteristics, which may reverse (especially at low wealth levels) the expected negative relationship between wealth and child labour, creating a relationship similar to that observed in figure 1.

IV. E Robustness

For robustness I also include the results of regressions with plot area as an independent variable of interest and two other dependent variables, levels of children participating in paid labour and children participating in school. The results in table A1 support the hypothesis of children focusing their labour efforts in domestic child labour as landholdings increase, since then the probability of children attending school decreases. Furthermore, the results in Table A2 point to the same conclusion, that is, as landholding increase within the community, children are less likely to participate in paid labour and more likely to participate in unpaid work on their family farms.

23

Not only do the results of these estimations provide additional evidence for the main theoretical hypothesis of this paper, but they also highlight some interesting consequences of land reform. In the presence of imperfect labour markets, an increase in landholdings can lead to a decrease in human capital for the community. Conversely, its effect on child wage labour in the community is significantly negative, meaning that it could reduce the incidence of child labour.

Additionally, the results of regressions containing privatization and both the alternative dependent variables are in table A3. The coefficients found in table A3 have smaller, yet significant effects similar to those mentioned above, indicating that privatization is likely to cause an increase in absence from school and a decrease in the participation in the paid labour market. Although the full implications of the estimation results in tables A1, A2, and A3 go beyond the scope of this paper, they help establish the link between land reform and its effects on poor communities.

Again, for robustness, I provide results of the regressions of Mean Plot Value with the two alternative dependent variables, child participation in paid labour and school attendance. Table A5 provides further support for the luxury axiom by displaying negative coefficients for both reggressands are significantly negative, meaning that as valuable assets increase, absence from school and participation in paid labour decrease.

V. Conclusions

This paper investigates the issue of child labour in the context of land reforms in transitions economies, using community data from Albania. Using a unique Eastern European data set provides information on children's domestic labour with parents, land acquisition through privatization, and plot value in Albanian currency. This has two major advantages. First, the separate land acquisition variable provided additional information on the direct effects of land reform on child labour. Second, the use of the plot value variable made it possible to separate the effects of the luxury axiom (or the pure wealth effect) and the imperfect labour markets (the hypothesized model).

Unfortunately, using binary data requires a maximum likelihood approach that requires strong assumptions i.e. independent and identical distribution of the error term conditional on the regressors. Hence, the lack of detailed data available has impaired the

24

estimation procedure slightly from a simple and robust estimation approach and made it necessary to perform numerous regressions with a variety of dependent and independent variables to establish robustness in the conclusions.

It was found that there is a risk on an increase in the incidence of child labour as the land reform progresses and more land is allocated to farm families. However, not all communities will be affected in a similar fashion. In particular, communities comprised of poorer families will respond to the increase in landholdings with an increase in domestic child labour to satisfy the need for extra labour induced by land reform. Conversely, in communities with average landholdings above a threshold level, will have a lower incidence of child labour with increased landholdings. This suggests that labour market imperfections may be significant enough to offset and even reverse the expected monotonically declining relationship between wealth and child labour. Therefore, when hiring labour is not feasible either because labour is not available or because the family cannot afford to hire labour, the family may be forced to resort to second-best resource allocations involving child labour. In addition, government policies such as privatization may be indirectly increasing domestic child labour, decreasing human capital accumulation, but acting as a deterrent for children entering paid labour.[29]

According to the empirical results of this paper, policies fostering smooth functioning adult labour markets and non-agrarian ways of increasing wealth are likely to be effective tools for reducing child labour. However, many concerns surpass the boundaries of this paper and should be addressed in future studies.

Like child labour, poverty is a complex phenomenon. This study used community landholdings as the measure of poverty in an agrarian society. While many countries have anti-poverty policies and strategies, they use different definitions of poverty making comparisons difficult. Although most developing nations are subsistence societies, where the main source of income comes from the land, this paper suggests that there is a need to look beyond landholding size to accurately define poverty.

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[29] See Appendix table A3 and A4 for results of regressions using child paid labour and children's school attendance as dependent variables and table A5 for the results with privatization included in the independent variables

The model's use of previously unavailable data makes it far less susceptible to endogeneity and selection bias problems that likely plagued previous papers. For example, it may have been argued that the size of land operated is endogenous: families with large numbers of children may lease in more land in order to be able to employ them productively. One could therefore instrument total land-holdings with the size of land owned, an index of inequality in the distribution of land within the community, and with the same set of infrastructure indicators. This paper uses land ownership data from a transition country with imperfect or missing land markets, because of this, the potential for such endogeneity is reduced, as it is reasonable to assume that land owned is exogenous.

Potential residual endogeneity remains within the measure of household income and landholdings, since child labour contributes to household income. The method proposed by Bhaltora and Heady (2003) for solving this endogeneity problem is using indicators of the level of infrastructural development of the community.[30] An extension to this paper could be made through use of an instrumental variable, eliminating the tendency for upward bias on the estimates. Land holdings (plot area) may be expected to be a good predictor of land leased in or out and therefore of total landholdings. This eliminates selection bias through exclusion of the majority of impoverished households without landholdings.

The most important results of this study would be to draw conclusions about potential government policy or relief programs. If most of development aid is dedicated to reducing poverty through long-term income stabilizers and policies encouraging agricultural asset accumulation, then these policies may harm human capital accumulation, impeding long-term growth. At the very least, this study could help point development policy in the direction of credit, land, and labour market restructuring; dedicating resources and skills to fixing the root of the problem, instead of simply bandaging the surface.

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[30] The problems of these instruments are mentioned in section II.

APPENDIX

Table A1
Results of No School, Ordered Logit (Plotarea)

Variable		Logit	Odds Ratio
Log Plot Area		3.633**	37.847***
		(0.446)	(16.882)
Log Plot Area		-0.247***	0.780***
(Squared)		(0.031)	(0.027)
Age		0.054***	1.055***
		(0.36)	(0.027)
Household Size		0.484***	0.616***
		(0.103)	(0.063)
Household Income		-0.131*	0.877*
		(0.53)	(0.046)
Highest Schooling		-0.157***	0.854***
		(0.52)	(0.029)
Rural		0.083***	1.087***
		(0.04)	(0.005)
Intercept	Cut 1	10.592	
		(1.571)	
	Cut 2	14.045	
		(1.575)	
Observations		280	280
Pseudo R-Squared		0.0821	0.0821

Note: Standard errors are in parentheses. *** indicates significance at 1%; ** at 5%; and, * at 10%.

Table A2
Results of Child Entering Paid Work, Ordered Logit (Plotarea)

Variable		Logit	Odds Ratio
Log Mean Plot Area		-1.402***	0.247***
		(0.391)	(0.963)
Log Mean Plot Area		0.094***	1.094***
(Squared)		(0.022)	(0.031)
Age		0.117***	0.889***
(Mean)		(0.330)	(0.030)
Household Size		0.580	0.943
(Mean)		(0.138)	(0.130)
Household Income		-0.426	1.530
(Mean)		(0.481)	(0.890)
Household Schooling		-1.235***	3.447***
(Mean)		(0.310)	(0.445)
Rural		-2.397***	0.095***
		(0.144)	(0.012)
Intercept	Cut1	-6.040346	
		(1.367)	
	Cut2	-4.591842	
		(1.366)	
	Cut3	-3.609717	
		(1.367)	
	Cut4	-3.400968	
		(1.366)	
Observations		280	280
Pseudo R-Squared		0.2055	0.2055

Note: Standard errors are in parentheses. *** indicates significance at 1%; ** at 5%; and, * at 10%.

Table A3
Results of No School, Children Working with Parents, and Children Working for Pay Logit (Privatization)

Variable		Noschool		Childpay
Log Plot Mean Area		3.619***		-1.384***
		(0.003)		(0.329)
Log Plot Value		3.619***		-1.384***
(Squared)		(0.453)		(0.391)
Privatization		0.017***		-0.008***
(Mean)		(0.003)		(0.003)
Age		0.045***		0.200***
(Mean)		(0.260)		(0.046)
Household Size		0.567***		0.028***
(Mean)		(0.105)		(0.143)
Household Income		-0.124***		-0.422***
(Mean)		(0.053)		(0.058)
Highest Schooling		-0.165***		-1.313***
(Mean)		(0.034)		(0.133)
Rural		0.090***		-2.470***
		(0.007)		(0.130)
Intercept	Cut 1	10.354	Cut 1	-5.859
		(1.357)		(0.550)
	Cut 2	13.839	Cut 2	-4.402
		(0.554)		(1.356)
			Cut 3	-3.400
				(1.356)
			Cut 4	-3.188
				(1.356)
Observations		280		280
Pseudo R-Squared		0.0873		0.2082

Note: Standard errors are in parentheses. *** indicates significance at 1%; ** at 5%; and, * at 10%.

Table A4
Results of Child Entering Paid Work and Children not Going to School (Plot value)

Variable		Noschool		Childpay
Log Mean Plot Value		-0.587***		-0.804***
		(0.145)		(0.329)
Log Mean Plot Value		-0.020***		-0.728***
(Squared)		(0.011)		(0.012)
Age		0.290***		0.195***
(Mean)		(0.261)		(0.047)
Household Size		0.560***		0.232
(Mean)		(0.105)		(0.142)
Highest Schooling		-0.132***		-0.060*
(Mean)		(0.034)		(0.035)
Household Income		-0.132***		-0.060*
(Mean)		(0.034)		(0.134)
Rural		0.107***		-2.598***
		(0.005)		(0.128)
Intercept	Cut 1	0.149	Cut 1	-7.109
		(1.357)		(0.550)
	Cut 2	3.68	Cut 2	-5.675
		(0.554)		(1.356)
			Cut 3	-4.705
				(1.356)
			Cut 4	-4.495
				(1.356)
Observations		280		280
Pseudo R-Squared		0.0961		0.2047

Note: Standard errors are in parentheses. *** indicates significance at 1%; ** at 5%; and, * at 10%.

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