Migration, Remittances, and Child Labor

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SHORT ABSTRACT

We examine child labor in the context of emigration and remittances. Remittances sent by the emigrating parents might enable not only their children, but also others, to stop working. Our empirical formulation of this model is recursive simultaneous equations model of migration, remittances and child labor supply, where we hypothesize a positive coefficient of both the migration and remittance variables in the child labor equation. We use Living Standards Measurement Survey (LSMS) data on the Kagera region in Tanzania, provided by the World Bank. It consists of a panel of close to 800 rural households for 1991, 1992, 1993 and 1994 and approximately 2500 in 2004, where some of the households can be traced back to the 1991-1994 panel.
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Background

According to the International Labor Organization (ILO), about 250 million children between the ages of 5 and 14 are working in developing countries. Out of that 250 million, at least 120 million work full time. Sixty-one percent are in Asia, 32% in Africa, and 7% in Latin America. The literature explaining child labor in developing countries and its negative impact on human capital accumulation and child health has centred around issues such as (i) poverty and the need of child labor resources to meet subsistence expenditures (Basu and Van, 1998; Basu, 1999), (ii) poverty combined with the absence of credit markets (Ranjan, 1999, 2001), and (iii) poverty combined with low ability children or low returns to education (Bacolod and Ranjan, 2006). The policy proposals emanating from this literature have included banning child labor or the import of products made by child labor, improving credit markets, imposing minimum wage restrictions or providing income support to households. No single traditional approach has managed to provide a tangible solution to the problem.

Recent research has extended the stylized gamut of explanations and policy recommendations in innovative directions. In a model of migration, remittances and child labor, Epstein and Kahana (2007) argue that the reduction of the amount of labor available in the aftermath of migration and the remittances sent by emigrating parents may enable not only the children, but also other family members to stop working. The wage increase emanating from the fall in labor supply may then make it possible for parents to withdraw their children from the labor force. Even though in a multiple-equilibria situation, wages decrease upon return of the migrants, they are still sufficiently high to avoid child labor.

In the context of functioning labor markets, the results from this model, provide a powerful new solution to the child labor problem by encouraging temporary migration of adult family members. Moreover, its innate measurability may help address an important deficit in the argument for the brain gain as significantly offsetting the brain drain – the existence of substantial measurable evidence. However, there is evidence suggesting that the majority of working children in Africa are employed on the farm, and missing or imperfect labor markets lead to child labor persistence even among the wealthiest land owners (Bhalotra and Heady, 2003; Bhalotra, 2003). In the context of a rural economy with few non-agricultural labor

opportunities and imperfect markets for hiring rural labor, one could therefore envisage a situation whereby the migration of adults in the family encourages child labor, while remittances may have a negative impact on child employment on the farm, with an overall unclear consequence to the child labor resolution problem.

It is this ambiguity on which we focus. Specifically, we try to find out whether migration and remittances reduce the child labor supply even in a rural context. First, we highlight the assumptions and predictions of the theoretical framework based on the model of Epstein and Kahana (2007). Nest, we estimate the model parameters with the use of data from the Kagera region in Tanzania.

Theoretical background

Following Kaushik Basu (1999) and Epstein and Kahana (2008) we consider an overlapping generations model in which each person lives for two periods: in the first as a child, and in the second as an adult. At the start of the second period, each couple gives birth to two children. An adult always works no matter what the wages are. A child can either work or go to school (that is, acquire human capital).

Basu and Van (1998) and Epstein and Kahana (2008) assume that the household preference is given by the Stone–Geary utility function $U(c,e) = \begin{cases} (c-s)(1-e) & \text{if } c \geq s \\ c-s, & \text{if } c < s \end{cases}$, where U is the utility of an individual, a child works for a fraction $e \in [0,1]$ of the workday, c is the consumption of the household and $s > 0$ is a parameter. Consumption is equally divided between the parents and the children.

Using such a framework, Epstein and Kahana (2008) show that there may be three equilibriums. The two extreme ones would be stable, while middle one would be unstable. In such a case if the adult wage is greater than a certain threshold only adults work, and if the wages are lower than a different threshold all children work. Otherwise there will be partial child labor. In this framework, Epstein and Kahana

(2008) show that a sizeable temporary emigration may remove, from the workforce, not only children of temporary emigrating workers, but all child laborers in the country**.** What they show is that temporary emigration (of one of the parents) results in a leftward shift in the labor supply. Assuming that the remittances sent by emigrating parents enable their children to stop working, each additional emigrant reduces the labor supply. Therefore, temporary emigration results in a decrease in the excess labor supply. The decrease in the excess labor supply needed in order to eliminate the bad equilibrium must be larger than a certain level. Emigration is temporary, and after a certain period of time the parents return to their families. Upon return, the labor supply curve will shift back to its original location, yet the economy will shift to a new, stable equilibrium without child labor. However, in this case upon return home the economy will move back to the initial child labor equilibrium. In order to prevent this, it is necessary that either *(a)* the parents do not return until the children grow up; or (*b)* a new wave of temporary emigrants substitutes for those who have returned. In any case, if the equilibrium, without child labor, can be sustained until the children grow up to be more productive worker-parents, which is equivalent to a reduction in the productivity of the new generation of children in terms of their parents then in this second generation child labor may be partially or even fully eliminated.

Empirical model

The preceding section indicated that both migration and remittances are important in shaping child labor supply by the household, hence child labor supply depends on migration and remittances. Our core equation is therefore:

[1] $Child\ labor = \alpha_0 + \alpha_1 Migration + \alpha_2 \,\mathrm{Re}\, mit\,\tan ces + \alpha_3 Z_1 + \varepsilon$

The null hypothesis is that both migration and remittances have a negative impact on child labor supply ($\alpha_1 < 0, \alpha_2 < 0$).

Remittances are produced by allocating household members to migration and given migration, are shaped by other household characteristics affecting the motivation and ability of migrants to remit:

[2] $\text{Re}\,mit\,\text{tan}\,ces = \beta_0 + \beta_1 Migraiton + \beta_2 Z_2 + \eta$

Migration is presented in reduced form as:

[3] $Migration = \gamma_0 + \gamma_1 Z_3 + \nu$

Equations 1-3 represent a recursive simultaneous equations system, where migration and remittances are clearly endogenous in the child labor equation (the household level characteristics which explain the probability of the household to be poor and/ or supply child labor are correlated with the ability of the household to produce migrants and the need to receive remittances)[1].

The migration history of the community, namely the proportion of migrants in the community population and the education level of the most educated household member are used to identify equation 3, while the presence of a shock or disaster in the past 6 months is used to identify equation 2. In addition, we control for various head of household, household structure, wealth and other household and farm characteristics, which are fairly stylized in the child labor, migration and remittance literatures. The description of the variables used is provided in Table 1.

The stochastic terms are assumed to be normally and independently distributed with the variance σ_i^2. However, it is possible that there may be a cross-equation correlation due to the influence of the same exogenous shocks on all three dependent variables. Hence, we estimate the system with the use of iterative three-stage least squares.

[1] Using Housman-Wu test, the exogeneity of the migration and remittance variables in the child labor equation are rejected.

Data and descriptive statistics

We use Living Standards Measurement Survey (LSMS) data on the Kagera region in Tanzania, provided by the World Bank. It consists of a panel of close to 800 rural households for 1991, 1992, 1993 and 1994 and approximately 2500 in 2004, where some of the households can be traced back to the 1991-1994 panel. Unfortunately, it is rather difficult to create satisfactory individual migration variables in the 2004 data set, so most of our analysis is restricted to the data on migration, remittances and child labor included in the latest cross-section of the 1991-1994 panel.

A preliminary examination of the data indicates that more than 99% of the households can be identified as "farm" households, i.e. households whose primary mode of subsistence is agriculture. In 65% of the households at least one family member migrated between 1991 and 1994, and approximately 85% of the households of migrants receive remittances. In approximately half of the households, children of age 5-15 work at least occasionally on the farm, while less than 1% of the children are employed outside of the family farm. These characteristics of the sample make it ideal for the test of our hypotheses.

In Table 2 we provide some descriptive statistics for the sample. Columns 1 and 2 compare the sample of households that supply child labor with the sample of households that do not supply child labor, Columns 3 and 4 compare households who received remittances with households who did not receive remittances, and Columns 5 and 6 compare households from which at least one member has migrated during the reference period.

The descriptive statistics indicate that the probability of the household to not supply labor increases with both the number of migrants and the total amount of remittances received. In addition, we see that the presence of children of both sexes in both the less than 10 and 10-15 age groups increases the supply of child labor, while the presence of both adults of working age and elderly people in the household decreases it. At the same time, the presence of hired labor on the farm is small and there is no significant difference in the average number of hired workers in farms supplying child labor and farms not supplying child labor. Furthermore, as expected, larger families are more likely to supply child labor.

The statistics also indicates that larger land (shambas owned) and farm capital (Farm assets) availability increase the probability of child labor, an observation

consistent with the literature on rural child labor (Bhalotra and Heady, 2003; Bhalotra, 2003). At the same time, the average value of non-farm assets is positively correlated with the absence of child labor and higher non-farm labor opportunities (e.g. the presence of a family business) decrease the chances of child labor supply.

Looking at the characteristics of households who produce migrants and receive remittances, we see that both of these characteristics are associated with higher levels of human and physical capital of the household. For instance, we see that the higher level of education and age of the head of household increase the probability of migration and receipt of remittances. Furthermore, the larger family wealth in terms of both land and non-farm assets, as well as the ownership of either trade or business increase the probability of migration and the receipt of remittances. Finally, as expected larger household sizes are associated with higher levels of migration and remittances.

Empirical results

Table 3 highlights the results from our empirical analysis. In column 1 we report the results from the OLS child labor regressions, treating migration and remittances as exogenous, while column 3-5 report the results from the 3SLS model for the child labor, remittance and migrants equations, respectively.

We see that in both models, the signs of both the remittance and migration variables are negative and significant, indicating a support for our predictions that both migration and remittances decrease the supply of child labor by the household. The results also indicate that the households of better educated and younger heads of household are more likely to experience migration. At the same time the coefficient of the maximum education variable is negative and significant, possibly due to the fact that the better educated marginal migrants in the family are able to grab superior opportunities outside of home thus decreasing the need of further migration from the household. In addition, the ownership of either land or business decrease the production of migrants by the household.

When looking at the characteristics of households receiving remittances, it appears that better off households are more likely to receive remittances, possibly on account of the better opportunity of donors with similar characteristics to assist them. In particular, we observe a positive coefficient of the durable asset variable and a negative coefficient of the number of dependents variables. Similarly, the presence of

a disaster in the village decreases the value of the remittances received by the household. However, the ownership of a business has a negative impact on the amount of remittances received, possibly on account of the better ability of business owners, compared to farmers to take care of their needs.

Finally, looking at the results on child labor in the 3SLS model, we see that higher level of education of the head of household decreases the supply of child labor. The presence of non-farm business decreases the supply of child labor as well. Interestingly, the higher value of durable assets increases the child labor supply. This observation is consistent with the previously cited finding that wealthier farm households in developing countries experience higher levels of child labor supply. Finally, the presence of children of both sexes in the age groups 10-15 increase the supply of child labor, while the presence of elderly females decrease it.

With several exceptions, the 3SLS results are broadly consistent with the OLS results. Since the 3SLS model is more appropriate in our case, we concentrate on interpreting only the results from the 3SLS model.

Table 1: Description of the variables used

Variable	Description
Child labor	The weekly labor supply of children of less than 15 years of age
Remittances	Total value of gifts received by the household during the preceding 6 months
Migrants	Total number of household members who migrated during 1991-1994
Pfage10	Proportion of females of less than 10 years of age
Pmage10	Proportion of males of less than 10 years of age
Pfage15	Proportion of females of 10-15 years of age
Pmage15	Proportion of males of 10-15
Pfage59	Proportion of females 16-59 years of age
Pfage60	Proportion of females of 60 and more years of age
Pmage60	Proportion of males of 60 and more years of age
Headedu	Dummy=1 if the head of household has any post primary education
Headage	Age of the head of household
Hhsize	Household size
Shambown	Number of shambas owned by the household
Durval	Total present resale value of durables
Fasset	Total present resale value of farm assets
Hiredlabor	Dummy=1 if the household hired any laborers
Usedfertil	Dummy=1 if the household used any fertilizer during the planting season
Trade	Dummy=1 if the household owns a trade
Business	Dummy=1 if the household owns a business
Pchild	Proportion of children in the household
Pelder	Proportion of elderly in the household
Disaster	Dummy=1 if the community underwent a shock in the past 6 months
Propdep	Proportion of community members who outmigrated in the past 4 years
Maxed	Education level of the most educated household member

Table 2: Descriptive statistics

Variable	CHL=1	CHL=0	R=1	R=0	M=1	M=0
Remittances/10000	2.22 (8.39)	4.83 (53.46)				
Migrants	1.66 (1.93)	1.85 (2.18)	1.72 (1.91)	1.95 (2.71)		
Pfage10	0.15 (0.14)	0.12 (0.15)				
Pmage10	0.16 (0.15)	0.12 (0.16)				
Pfage15	0.11 (0.13)	0.03 (0.08)				
Pmage15	0.13 (0.14)	0.04 (0.09)				
Pfage59	0.21 (0.13)	0.25 (0.20)				
Pfage60	0.04 (0.09)	0.07 (0.17)				
Pmage60	0.03 (0.07)	0.08 (0.19)				
Headedu	0.06 (0.23)	0.05 (0.21)	0.06 (0.24)	0.01 (0.09)	0.06 (0.24)	0.03 (0.17)
Headage			52.08 (20.85)	41.02 (26.54)	51.32 (24.02)	48.37 (18.16)
Hhsize	9.08 (4.10)	6.57 (3.96)	8.18(4.25)	6.07(3.59)	8.99 (4.31)	5.66 (3.01)
Shambown	2.48 (1.74)	1.87 (1.60)	2.30 (1.71)	1.55(1.46)	2.17 (1.63)	2.20 (1.82)
Durval/10000	0.09 (0.42)	0.20 (2.69)	0.17 (2.08)	0.02 (0.09)	0.19 (2.35)	0.05 (0.13)
Fasset/10000	0.007 (0.20)	0.004 (0.16)				
Hiredlabor	0.33 (0.47)	0.32 (0.47)				
Usedfertil	0.02 (0.13)	0.02 (0.13)				
Trade	0.09 (0.29)	0.09 (0.28)	0.10 (0.30)	0.02 (0.16)	0.09 (0.28)	0.09 (0.29)
Business	0.42 (0.49)	0.37 (0.48)	0.43 (0.50)	0.20 (0.40)	0.42 (0.49)	0.34 (0.48)
Pchild			0.33 (0.20)	0.25 (0.24)		
Pelder			0.27 (0.23)	0.46 (0.37)		
Disaster			0.68 (0.47)	0.68 (0.47)		
Propdep					0.00 (0.01)	0.00 (0.01)
Maxed					1.03 (0.52)	0.97 (0.43)
N Observations	383	372	634	121	496	259

Note: the values in brackets are standard deviations

Table 3: Regression results

	Childlabor	Childlabor	Remittances	Migrants
Remittances	-0.0197* (0.0107)		-0.4560*** (0.1689)	
Migrants	-0.9666*** (0.2554)	-1.9449*** (0.4479)	2.6220 (3.3909)	
Pfage10	2.5614 (3.0095)	-4.4949 (3.6255)		
Pmage10	7.2857** (2.9055)	-1.3907 (3.7686)		
Pfage15	21.5973*** (3.6889)	15.1526*** (4.2656)		
Pmage15	27.9411*** (3.3803)	24.0406*** (3.7124)		
Pfage59	-5.7137** (2.5986)	-1.1031 (3.9510)		
Pfage60	-3.5186 (3.0702)	-5.4616* (3.3201)		
Pmage60	-1.3783 (2.9153)	-3.1046 (3.1082)		
Headedu	-4.7492*** (1.7832)	-4.7561** (2.2567)	-0.1633 (6.1253)	0.9947*** (0.3249)
Hhsize	0.8286*** (0.1419)	1.7921*** (0.3102)	0.8536 (1.1505)	0.3188*** (0.0162)
Shambown	0.6357** (0.2527)	0.4526 (0.3402)	0.2802 (0.8386)	-0.1559*** (0.0374)
Durval	-0.0052 (0.0208)	0.1406** (0.0608)	0.3457*** (0.0707)	-0.0020 (0.0032)
Fasset	0.1417 (0.2293)	0.7068 (0.5536)		
Hiredlabor	0.6947 (0.8774)	1.4490 (0.3102)		
Usedfertil	9.6463*** (3.0302)	8.7809*** (3.0790)		
Trade	-2.4942* (1.3836)	-4.2736** (1.8018)	-4.3655 (4.7786)	-0.2677 (0.2166)
Business	-0.8601 (0.8468)	-3.4477** (1.3489)	-5.8228** (2.8925)	-0.3058** (0.1292)
Pchild			-26.5875*** (10.1228)	
Pelder			-28.2384** (14.1711)	
Headage			0.0376 (0.0661)	-0.0051* (0.0029)
Disaster			-4.3406* (2.2810)	
Propdep				-5.7327 (12.2091)
Maxedu				-0.6753*** (0.1557)
Constant	-1.9236 (1.4727)	-3.3170 (2.1172)	11.9974* (6.1684)	0.6523*** (0.2028)
N Obs.	755	755	755	755

Note: ***. ** and * indicate significance at the 1%, 5% and 10% level, respectively. The numbers in brackets are standard errors.

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