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Migration, Remittances and Educational Outcomes: the Case of Haiti

by

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Abstract

Using the Cox proportional hazards model this paper empirically investigates how migration of household members and the receipt of remittances affect educational outcomes in Haiti. Based on a theoretical approach it tries to disentangle the effects of both phenomena that have mostly been jointly modeled in previous literature. The results suggest that remittances play an important role for poor households in alleviating budget constraints, whereas no effect of the migrated household head's absence is detected. The latter might be so due to the high imprecision surrounding the estimated hazard ratios. Household wealth, captured via an asset index, is found to have a significant impact on education as well, supporting the idea that budget constraints play a crucial role in schooling decisions in Haiti due to the dominance of private schools and the high poverty rate in the country.

Keywords: Haiti, education, remittances, migration
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1 Introduction

Migration and remittances constitute a thematic constellation that has gained a lot of attention in recent years. This attention has resulted in a large strand of literature, covering especially the impacts of those phenomena on key development factors in poor countries.

Studies dealing with this issue heavily focus on Latin America and the Caribbean. This might be due to two facts: primarily, migration and remittances play an important role in that region. In 2005, the share of migrants in the entire population amounted to 5.1%, compared to 3% worldwide, and remittances sent to the region rose from 13 billion US-$ in 1995 to 60 billion US-$ in 2007, constituting up to 20% of the national GDP in some countries (Ratha and Xu, 2008). Secondly, the most important migration corridors out of the region lead to the United States, a fact that implies a clear 'south to north' movement pattern (ibidem). Thus, Latin American and Caribbean countries provide the opportunity to investigate explicitly the impact of migration from developing to developed countries and of remittances flows in the opposite direction.

Literature in this context focuses on two main issues: the impact of migration and remittances on poverty and income equality (Taylor, 1992; Adams, Jr. and Page, 2005; López-Córdova, 2005; Taylor et al., 2005; Acosta et al., 2006, 2007, 2008) as well as the impact of both phenomena on children's educational outcomes (Edwards and Ureta, 2003; Hanson and Woodruff, 2003; López-Córdova, 2005; Acosta, 2006; McKenzie and Rapoport, 2006; Acosta et al., 2007; Amuedo-Dorantes et al., 2008; Calero et al., 2009). This paper adds to the latter strand of literature as it investigates the importance of migration and remittances for educational processes in Haiti.

The focus on education can be motivated by the fact that growth theory recognizes education, or the formation of human capital, as one decisive factor in the development process of an economy (Romer, 1986; Lucas, Jr., 1988). Knowledge about the impact of migration and remittances on such key development determinants is crucial in order to assess whether both phenomena can be seen as detrimental or advantageous from a developing country's perspective. From a theoretical point of view migration is, as outlined in more detail in Section 2, expected to have a negative impact on educational outcomes, while the impact of remittances is expected to be neutral or positive. Hanson and Woodruff (2003) explain the former hypothesis by a rise of children's duties in the household as a consequence of the migrated member's absence and by a loss of adult role models. The latter assumption is based on the fact that remittances alleviate budget constraints a poor household is faced with when allocating resources to children's education. Haiti is one of the poorest countries in the world and the poorest country in the Latin American/Caribbean region, with half of the households living below the poverty line (Justesen and Verner, 2007). Given these facts, it seems highly plausible that budget constraints play an important role in educational decisions in that country.

The previous empirical findings concerning the impact of migration and remittances on educational outcomes in Latin American and Caribbean countries

are ambiguous. Edwards and Ureta (2003) find positive effects of remittances on children's education in El Salvador, using the Cox proportional hazards model. Hanson and Woodruff (2003) obtain significantly positive estimates of a variable indicating whether the household has migrant members or not for Mexico. However, interaction of the migration variable and the mother's education reveals that the positive effect can only be found for households with low maternal education. This is not surprising, given the fact that households with lower parental educational levels also tend to be poorer. If the positive effects of migration are in fact caused by remittances (which are not explicitly modeled by Hanson and Woodruff), positive effects should only occur if budget constraints are binding (see also section 2 on this issue). This is typically the case in poor households. Furthermore, due to endogeneity concerns, the authors instrument the migration variable via historic migration rates. Error term and the dependent education variable could be correlated in case of unobserved income shocks that affect children's educational processes and at the same time cause the migration of one or several household members.[1] McKenzie and Rapoport (2006) mention unobservable anxiety to educate children as another potential source of endogeneity. Anxious parents might migrate in order to remit and finance their children's education while anxiety is likely to also be a positive shock on educational outcomes captured by the error term. McKenzie and Rapoport as well use historic migration rates as instruments but find negative impacts of migration on educational outcomes in Mexico. However, their results resemble those of Hanson and Woodruff to the extent that they indicate a more positive impact of migration in poor households than in rich ones.

Acosta (2006) discusses endogeneity and selection issues if remittances are used as explanatory variable. Principally, the same reasoning applies as was outlined for the migration variable. One can imagine that recipient households are not a random sample but differ systematically from other households in unobserved or unobservable ways, for example in having more pronounced anxiety to educate children. Another potential source of endogeneity is the correlation between remittances and unobserved income shocks, arising if remittances are systematically used to compensate such shocks. Acosta estimates various model specifications, using data from El Salvador, including probit, matching and instrumental variables approaches, most of which do not lead to a significant coefficient associated with the remittances variable. Acosta et al. (2007) assess the impact of migration and remittances in eleven Latin American and Caribbean countries including Haiti by estimating the counterfactual household income, i.e. the income a remittances receiving household would have earned in a scenario without remittances *and* without migration. In order to obtain this counterfactual value, the authors estimate the wage that the remittances sending migrant would have earned in the domestic labor market. The counterfactual income is then plugged along with a variable indicating the remittances recipient status in the estimation. In six out of eleven cases, the results show positive

[1] In this context Hanson and Woodruff (2003) offer the example of unemployment of a household member. Unemployment leads to an unobserved income shock and might bring the household member to migrate and to look for a new job abroad.

effects of remittances on educational outcomes. Concerning Haiti, the results suggest positive effects for girls, but no effects for boys. Amuedo-Dorantes et al. (2008) combine Haitian and US data to proxy the income of potential remittances senders in the United States. The resulting variable serves as an instrument for the remittance recipient status of a household in IV-Probit estimates. The results suggest a positive impact of remittances on educational outcomes. The authors indirectly try to disentangle the effects of migration and remittances by using two different samples for their estimates: one sample includes all households, the other one only those, that have not experienced migration of members. Results show that the impact of remittances in the latter sample is more positive, which suggests a negative impact of migration on educational outcomes. Calero et al. (2009) also use the IV-Probit approach for the case of Ecuador. In their estimates the availability of Western Union branches serves as an instrument. They find significantly positive effects of remittances for girls, children in rural areas and for children living in poor households.

None of the studies cited above model migration and remittances as separate variables. Instead, all studies with the exception of the one of Amuedo-Dorantes et al. (2008) assume both phenomena to occur simultaneously. Thus, the estimated impact of the respective variable must be interpreted as the net effect of migration *and* remittances. However, the examination of the data used for this study presented in Section 4 reveals that the assumption of simultaneous occurrence does not seem to hold for many households included in the dataset. For this reason – and in contrast to previous research – it is attempted to capture the effects of migration and remittances via two separate variables.

The remainder of the paper is structured as follows: Section 2 outlines the theoretical model by McKenzie and Rapoport (2006) on impacts of migration and remittances on educational outcomes, while Section 3 gives a brief overview of the Haitian educational system. A description of the data and a discussion of the empirical model is provided in Section 4, the results are presented in Section 5. Section 6 concludes.

2 Theoretical Background

McKenzie and Rapoport (2006) present a theoretical model that formalizes the impacts of migration and remittances on educational outcomes. The model emphasizes the opposed effects both phenomena have on education, already mentioned in the introductory section. Starting point of the model is the idea of describing the 'gain' $\Pi_{i,l}$ of the l -th year of schooling for child i as follows:

$$\Pi_{i,l} = r_{i,l} - c_{i,l} - k_{i,l} \tag{1}$$

The parameter $r_{i,l}$ is the discounted additional income that child i is expected to earn in the future by completing the l-th year of schooling. The monetary costs for child i's household associated with the additional year of schooling are denoted by $c_{i,l}$, the respective opportunity costs that might arise, for example due to missed labor market income are captured by $k_{i,l}$. It is important to note

that $c_{i,l}$ must be funded by current household income, whereas $r_{i,l}$ will only be realized in the future. Thus, the sum of $c_{i,l}$ over all years of schooling must not exceed the amount E_i which is the maximal amount the household can provide for child i's schooling. This leads to the following maximization problem, s_i indicating child i's number of years of schooling received:

$$s_i^* = \max_s \sum_{l=1}^{s} (r_{i,l} - c_{i,l} - k_{i,l}) \quad \text{with} \quad \sum_{l=1}^{s} c_{i,l} \leq E_i \tag{2}$$

If the budget constraint is not binding for the household, s_i^* will equal s_i^U, the unconstrained amount of years of schooling. One might interpret the parameter s_i^U as the optimal number of years of schooling in the sense of Becker and Tomes (1979).[2] Remittances alleviate the household's budget constraint and have no effect on the educational outcome of child i if the budget constraint is not binding, i.e. if s_i^* equals s_i^U, without the receipt of remittances. However, if s_i^* is inferior to s_i^U, remittances will cause an increase of s_i^* towards the optimal level.

In turn, the migration of household members supposed to adversely affect educational outcomes. As already mentioned in the introduction, the absence of household members might cause an increase of children's duties in the household (Hanson and Woodruff, 2003), a fact which is interpreted as an increase of the opportunity costs of schooling $k_{i,l}$ by McKenzie and Rapoport. Furthermore, McKenzie and Rapoport point out that the presence of a household member in a foreign country might as well enable the migration of the child. Thus, the opportunity costs due to missed income would rise, as they would be determined by higher wages in the potential target country. Alternatively, one might assume an increase of the future instead of the immediate migration probability of the child. Then the expected return to education, captured by the parameter $r_{i,l}$, changes according to the differences between the returns in the home and in the potential target country. Returns to education have been found to be higher in poor countries than in rich ones (Psacharopoulos and Patrinos, 2004), consequently $r_{i,l}$ is likely to decrease. Additionally, it is plausible to assume that a schooling degree obtained in a developing country is considered to be of inferior value in richer countries. Bratsberg and Terrell (2002) confirm this assumption by comparing returns to education of immigration groups from different countries in the United States. The returns for groups from poorer countries are generally lower than for those from richer countries, with Haitian immigrants exhibiting the lowest return of all. Given that an increase of $k_{i,l}$ as well as a decrease of $r_{i,l}$ will lead to a decline of s_i^U, the effect of a household member's migration on educational outcomes is negative unless budget constraints are binding and s_i^U does not fall below the level of s_i^*.

To sum up, the model suggests that the net-effect of migration and remittances in rich households is negative, as migration's adverse effects are not

[2] Becker and Tomes (1979) assume decreasing marginal returns to schooling. In that sense, the authors interpret the s_i^U as the educational level where marginal returns to schooling and marginal returns to other investments are barely equal.

compensated by a positive impact of remittances. For poor households, where the budget constraint is binding, the net-effect is ambiguous. It depends on whether the decline of s_i^U is strong enough to push the child's education below the initial level s_i^*.

The fact that previous empirical results on the effects of migration and remittances on educational outcomes are ambiguous is in line with the above model as these impacts have mostly been investigated via a variable combining both effects. The results of Amuedo-Dorantes et al. (2008), who try to indirectly disentangle those impacts, indicate a positive impact of remittances opposed to a negative impact of migration. Furthermore, the more positive impact of both phenomena on educational processes in poor households compared to those in rich ones, as predicted by the model, has been found as well. In the present paper, migration and remittances are modeled as separate variables. This allows to separate the effects of migration and remittances and to figure out whether negative impacts are really due to the former, whereas positive effects are caused by the latter.

3 The Haitian Educational System

The Haitian educational system is basically composed of three parts.[3] The basic school education (enseignement fondamental) lasts nine years and is deemed to convey basic mental and technical skills to the students. Generally, children start school at the age of six, which implies an age of 15 at the end of the basic school education. The secondary school (enseignement secondaire) comprehends the last three years of the basic school as well as four additional years. Thus, completion takes place after an overall of 13 years of schooling, at a theoretical age of 19. The "diplôme du bac II" certifies that the secondary school has been finished and provides access to the university (enseignement supérieur). A university degree can be obtained after three to five years of studies. An alternative education is offered by the professional formation (formation professionnelle) which conveys practical skills to students who wish to learn a certain profession. It is open to students who possess a basic academic education (i.e. six or nine years of schooling).

The Haitian Constitution concedes a free basic education to every citizen. However, as the Haitian state is not able to provide the required resources, 75% of the enrolled children in Haiti attend private schools at the basic level and as much as 82% at the secondary level (Salmi, 2000). Examination of the number of school facilities delivers a similar picture. For schools providing basic education the share of private facilities was 86.4% in 1994, for secondary schools the respective share amounted to 84% (International Bureau of Education, 2006). The overwhelming importance of the private sector for the Haitian school system is also revealed by the distribution of funding burdens. Although public expenses for education rose from 1.3% of GDP in 1990 to 1.9% of GDP in 1995,

[3]Information in this paragraph are taken from the Ministère de l'Education Nationale de la Jeunesse et des Sports (2004).

this figure seems almost negligible compared to 12% of GDP contributed by private households (International Bureau of Education, 2006). These private contributions take, for example, the form of fees, costs for uniforms or costs for textbooks (Salmi, 2000). Until the return of President Aristide from exile in 1994 even public schools demanded financial support from enrolled children's parents. The abolishment of those practices led to a decline in school quality, as the public facilities did not receive any compensations from the state (ibidem).

Generally, the quality offered by Haitian educational facilities is alarmingly low, resulting in high repetition rates and a high share of over-age students (Salmi, 2000). The average age of students receiving the "diplôme du bac II" is 21 instead of 19 (International Bureau of Education, 2006). The already mentioned finding of Bratsberg and Terrell (2002), that returns to education for Haitians in the United States are lower than for any other immigration group, does not come as a surprise given those conditions.

Besides the high costs of having enrolled children and the low quality, access to schools is another problem in Haiti. Especially children in rural areas often have to cover long distances to reach a facility and as in many cases no other means of transportation is available, this has to be done on foot (Verner, 2008). Concerning gender related discrimination, Salmi (2000) reports that there are no signs of unequal educational opportunities for boys and girls in Haiti. In fact enrollment rates are equally high for both genders.

To sum up, given the heavy financial burdens households with schooled children experience and given the high level of poverty in Haiti, it seems extremely plausible that budget constraints play a highly important role for educational decisions in that country. This assumption is confirmed by Justesen and Verner (2007) who – based on data from the 'Haiti Living Conditions Survey' (HLCS) – identify high costs of schooling as the most important reason for non-enrollment of children. Furthermore the authors observe – despite the low quality of schools – a high level of trust in teachers and educational facilities, as well as a considerable appreciation of education itself amongst Haitians. Poor families are willing to sacrifice all available resources to their children's education. Consequently one can easily imagine that alleviating budget constraints via remittances will have a considerable effect on educational outcomes in Haiti.

4 Data and Empirical Model

The data used for the empirical analysis is taken from the Latin American Migration Project (LAMP) that is an extension of the Mexican Migration Project. It is conducted by Princeton University, the University of Guadalajara and numerous local partners.[4] The aim of the LAMP is to provide household survey data that can serve as a basis to investigate migrational processes from Latin American and Caribbean countries to the United States. Data has been collected in eight countries, Haiti being one of those.

[4]The data is accessible under: http://lamp.opr.princeton.edu/

Amongst others, the Haitian dataset contains information on household assets, household members' characteristics, remittances recipient status and migration experiences of household members. Furthermore, the dataset exhibits the migration, work, and family life-history of household heads. It is important to note that the information concerning remittances receipt and migration in the LAMP data refer explicitly to, respectively, remittances from and migration to the United States. This should not be considered a shortcoming in the context of the present paper, as especially this type of movement from poor to rich countries is of interest when investigating impacts of migration and remittances on key development factors. Furthermore, the United States are the most important destination country for Haitian migrants and by far the most important source country of remittances flowing into Haiti (Orozco, 2006).

The LAMP-survey was conducted in three Haitian communities. For that reason, it should not be considered to be representative for the whole Haitian population (cf. Amuedo-Dorantes et al., 2008). Community 1 is part of the city of Jacmel in the country's south-eastern department. In the past, this city was, for the most part, untroubled by political unrest and possesses – relative to the rest of the country – a good quality of infrastructure. Schooling facilities are abundant, ranging from very low quality schools to several high schools which are among the best in the country. Community 2 is located in the south-west of Haiti. Community 3 on the Atlantic coast in the country's north western department is known as a starting point for Haitian migrants heading for the United States. Access to the community is difficult due to the bad quality of roads. Unfortunately, there is no information available concerning the supply and quality of schooling facilities in Communities 2 and 3. In total, 303 Haitian households have been surveyed, almost equally distributed across the three communities.[5] The survey was conducted in December 2000 and January 2001 in Community 1 and in December 2002 and January 2003 in the other two communities.

The sample used for the estimation consists of persons aged between six and 25 years. Whereas the fixation of the lower age limit can easily be justified by the fact that younger children simply can not be expected to be enrolled in school the upper limit is quite arbitrary. In fact, when fixing the upper limit, one is confronted with a trade-off: on the one hand, the higher the limit is, the larger the sample gets, which is not unimportant given the relatively small overall size of the LAMP-sample. On the other hand, as only cross-sectional data and no panel data are available, the assumption of observing data mirroring the situation that determined the educational outcome of a person, gets the more implausible the older the person is. This problem is especially severe if the person has already founded their own household or lives in a household with a head from their own generation (spouse, sibling, cousin). In that case, the data reveal no information concerning characteristics of the household the person used to live in as a child. Thus, such persons are removed from the sample.

[5] 100 households have been surveyed in Communities 1 and 2, 103 households have been surveyed in Community 3.

Table 1: Average years of schooling and share of persons dropped out of school in the sample by age groups

Age group	Number of observations	Average years of schooling	Share of persons dropped out of school
6−12	90	4.2556	2.22%
13−15	62	7.8871	3.23%
16−19	84	10.1667	13.10%
20−25	124	12.1048	35.48%

Clearly, this approach bears the risk of introducing a selection bias.[6]

A further problem is posed by obvious inconsistencies in the data. As children are enrolled in Haiti at the age of six and the Haitian educational system is characterized by high repetition rates, one should expect the difference between age and completed years of schooling of a person to be at least six years. However, in a lot of cases this difference is smaller and in a few cases even negative. One explanation might be that respondents erroneously included the years spent in kindergarten when declaring their or their children's years of completed schooling. To partially capture this bias, a "kindergarten-dummy" is introduced in the empirical model for persons exhibiting a difference smaller than six years. Still, years spent in the kindergarten do not explain, why in some cases the difference between age and reported years of schooling is extremely small or even negative. Consequently the respective person is removed from the sample, if the difference is smaller than three years. However, it is not assessable for how many of the remaining persons the kindergarten-years are included in the number of completed schooling years as well. Generally, the average of years of schooling seems implausibly high for an extremely poor country like Haiti, especially as illiteracy – despite a decline in recent decades – is still reported to be considerably high (Verner, 2008). This can be seen in Table 1 which displays the average years of schooling in the sample by age groups as well as the share of those who do not declare that being a student is their main occupation and are thus considered to have dropped out of school.

Before turning to estimating the effects of migration and remittances on educational outcomes in Haiti, the question of how to adequately measure household wealth has to be addressed. Theoretical models (see e.g. Becker and Tomes, 1979; Taubman, 1989) as well as empirical research for developing countries (see e.g. Lloyd and Blanc, 1996; Anh et al., 1998; Filmer and Pritchett, 1999; Buchmann, 2000) suggest an important role of household wealth in this context. Furthermore, in the context of the model of McKenzie and Rapoport (2006) outlined in Section 2, household wealth is likely to be the key determinant of parameter E_i, that is the maximum amount of resources a household can provide

[6]Descriptive statistics indicate that persons who drop out of the sample because the head of their household is from their own generation are less educated, are more likely to be female and are older than persons in the sample.

for the education of child i and thereby indicates whether budget constraints are binding. As outlined in the previous section, budget constraints are likely to have a strong impact on educational decisions in Haiti.

Measuring wealth of a household is a non-trivial issue, especially in developing countries. Seasonal fluctuations and the importance of self-sufficiency make monetary income in those countries extremely difficult to measure (Sahn and Stiefel, 2003). An alternative is the use of household expenditures as a wealth proxy, which are suspected to be less volatile than income due to the tendency of consumption smoothing (Filmer and Pritchett, 2001). However, it is questionable whether the respondents in household surveys are able to recall those expenditures correctly. The finding that the design of a questionnaire can have systematic effects on the reported expenditures sheds doubt on the reliability of the collected data.[7] Furthermore, in the context of the present paper, the use of such data is not possible, as it was simply not collected in the course of the LAMP survey in Haiti.

Instead, an asset index is used in the estimations to proxy household wealth. In this context, such an index is a third alternative besides income and expenditure. The idea is to aggregate information about the household's possession of different long term assets into one single index and to interpret that index as a proxy for wealth or permanent income (cf. Filmer and Pritchett, 2001; Minujin and Bang, 2002). The advantage of this approach is that a respondent in a survey is supposedly able to declare the presence of several long term assets (e.g. TV, radio, car) much more precisely than the expenditures in a given time period (McKenzie, 2005). Furthermore, an index based on long term assets is not likely to be influenced by short-run fluctuations in household income. As the single asset variables might be expressed in different units (e.g. number of rooms available vs. dichotomous variables indicating the (non-)presence of an asset in a household) it is straightforward to include them in standardized form into the index. Thus, the index value z_j for household j based on the assets $1, \ldots, m$ can be expressed as follows (McKenzie, 2005):

$$z_j = a_1 \left(\frac{y_{1j} - \overline{y}_1}{\widehat{\sigma}_{y_1}} \right) + \cdots + a_m \left(\frac{y_{mj} - \overline{y}_m}{\widehat{\sigma}_{y_m}} \right) \tag{3}$$

The variables $y_{1j}, \ldots, y_{mj}$ contain information about the asset holding in household j, whereas $\overline{y}_1, \ldots, \overline{y}_m$ and $\widehat{\sigma}_{y_1}, \ldots, \widehat{\sigma}_{y_m}$ are the respective sample means and standard deviations. The weights $a_1, \ldots, a_m$ are determined via principal component analysis (cf. Filmer and Pritchett, 2001; Minujin and Bang, 2002; McKenzie, 2005, for the use of that method to determine the weights in an asset index), which implies that the variance of the index value across all households is maximized (see Chatfield and Collins, 1980, for the formal proof of this statement and for a formal discussion of principal component analysis). The estimated rescaled weights for each asset are displayed in Table 2. Rescaled weights are the estimated weights $\widehat{a}_1 \ldots \widehat{a}_m$ divided by the respective sample

[7] Pradhan (2001) reveals that a higher level of aggregation in the questions leads to a lower measured consumption level.

Table 2: Rescaled weights derived by the principal component analysis and means of the included asset variables in the overall sample, as well as for the households exhibiting a value above and below the median of the index.

Variable	Weights (rescaled)	Mean overall	Mean above median	Mean below median
Stove*	0.6084	0.7085	0.9257	0.4898
Refrigerator*	0.7600	0.6229	0.9753	0.2682
Washing Machine*	0.6109	0.0201	0.0397	0.0004
Sewing Machine*	0.2249	0.2867	0.3261	0.2470
Radio*	0.0042	0.8602	0.8526	0.8745
TV*	0.5100	0.7542	0.8997	0.6078
Stereo*	0.6341	0.6745	0.9211	0.4263
Telephone*	0.7047	0.5418	0.8851	0.1962
Construction material house[a]				
Adobe*	−0.8095	0.1124	0.0177	0.2077
Brick and cement roof*	0.4834	0.5506	0.7056	0.3944
Wood*	−0.3345	0.0412	0.0304	0.0521
Floor material[b]				
Dirt*	−1.2031	0.0193	0.0027	0.0361
Flooring* (carpet etc.)	0.5492	0.4633	0.6759	0.2494
Number of rooms[c]	0.1276	1.6744	2.0228	1.3236
Own house*[d]	0.4009	0.6066	0.7490	0.4633
Further estate*[e]	0.4638	0.1122	0.1908	0.0331
Car*	0.5596	0.2310	0.4145	0.0464
Truck or pickup*	0.3464	0.1188	0.1908	0.0530
Motorcycle*	0.2431	0.0660	0.0987	0.0331
Tap water*	0.8540	0.8716	0.9926	0.7499
Electricity*	0.6074	0.7200	0.9408	0.4977
Sewage*	0.2727	0.8243	0.8673	0.7811

*indicates dichotomous variables that equal one if the household possesses the good, and zero otherwise.
[a]The category "brick and tiled roof" was omitted in order to avoid collinearity.
[b]The category "cement" was omitted in order to avoid collinearity.
[c]The number of rooms is the actual number divided by the number of household members according to the new OECD-criterion: $1 + 0.5 * (\text{Number of Adults-1}) + 0.3 * (\text{Number of Children up to 14 years})$
[d]The variable "Own house" takes on the value of one if the household possesses ist dwelling and zero otherwise.
[e]The variable "Further estate" takes on the value of one if the household possesses further estate besides its dwelling and zero otherwise.
Missing values were replaced by the sample mean.
The first principal component accounts for 19.50% of the overall variance of the standardized asset variables.
Calculations were conducted with Stata 10.

standard deviation. Thus, rescaled weights indicate the change of the index value if the asset variable changes by one unit (e.g. switches from zero to one, which is interesting to observe if the asset variabel is a dummy). All rescaled weights that one would intuitively associate with higher wealth have a positive sign. Comparing the sample means of asset variables for households in the upper half and those in the lower half of the index distribution also yields consistent results.

When comparing the number of households with at least one member with migration experiences to the United States and the number of households that receive remittances from that country, one notices a striking discrepancy in the Haitian LAMP dataset: 51 migration households are opposed to 171 remittances receiving households. Given those numbers it is highly doubtful that both phenomena are linked as strongly as considered by previous literature. In fact, it seems rather reasonable to estimate the effects of migration and remittances separately. Furthermore, as households do not receive remittances from their own members in the majority of cases, it is debateable whether there exists a self-selection of recipient households or whether those households are just lucky to receive transfers from a non-member.

Table 3 displays the share of migrant households as well as the share of recipient households for each quartile of the asset index distribution. The table shows that there seems to be a pattern of self-selection among migrant households: the richer the household is in terms of the asset index, the more likely it has a member with migration experience. The same holds for the receipt of remittances. However, it is unclear how to interpret this finding: it might indicate self-selection among recipient households but the causality could be inverse as well, if remittances from the United States are used to accumulate further assets. In that context, the household head's education seems to be more apt to reveal potential self-selection patterns. As in the subsequent empirical analysis, education of the household head is measured via his completed years of schooling. If the head's spouse has completed more years of schooling than the head himself, his or her educational level is used instead (cf. Edwards and Ureta, 2003, for this approach). This variable is correlated with the asset index – the correlation coefficient is 0.48 – but is not influenced by the receipt of remittances (cf. McKenzie and Rapoport, 2006). Table 4 reveals that potentially poorer households are more likely to receive remittances than richer ones when wealth is measured by the household head's or his spouse's educational level. However, the shares only differ slightly between the three groups. Given this finding along with the fact that most of the recipient households in the LAMP-dataset receive remittances from non-members, one can conclude that self-selection among recipient households should not be a major problem in the further empirical analysis.

To assess the impacts of migration and remittances on educational outcomes, it is a plausible idea to estimate the impacts of those variables on the risk of dropping out of school. This risk can be expressed by the hazard rate. The hazard rate is the probability that a state – in that case schooling – ends in a certain period, given that the state could be observed until that period. To estimate

Table 3: Share of migrant households and share of recipient households in each quartile of the asset index distribution

Quartile	Share of migrant households	Share of recipient households
1	2.74%	35.62%
2	13.51%	59.46%
3	30.14%	67.12%
4	33.78%	70.27%

Table 4: Share of recipient households by educational level of the household head or his spouse

Completed years of schooling	Number of observations[a]	Share of recipient households
1–6	96	61.46%
7–13	124	58.87%
14+	52	50.00%

[a]The values in this column do not sum up to the total number of surveyed households of 303 due to non responses.

the hazard rate one can employ nonparametric methods like the Kaplan-Meier estimator that requires no a priori distributional assumptions. However, these methods do not allow for the evaluation of the impact of exogenous variables on the hazard rate.

In the context of the present paper, not the hazard rate itself, but rather the impact of exogenous covariates – especially of migration and remittances – is of interest. This impact can be assessed by fully parametric models. These models assume a priori a certain distribution of the hazard rate, then the parameters of that distribution are modeled as functions of certain covariates. However, the strong a priori assumptions of fully parametric models induce a high risk of misspecification (Cameron and Trivedi, 2006, p. 592).

This paper sticks to the approach of Edwards and Ureta (2003) and resorts to the Cox proportional hazards model (hereafter: Cox model). This model expresses the hazard rate for person i, γ_i as a function of the so-called baseline hazard $\gamma_0(t)$, a vector of covariates $\boldsymbol{x}_i$ and the coefficient vector $\boldsymbol{\beta}$. There is no need to predefine a distribution for the baseline hazard, which provides more flexibility compared to fully parametric models and hence decreases the risk of misspecification (cf. Cameron and Trivedi, 2006). The functional part of the hazard rate includes the covariate vector as well as the coefficient vector and is typically modeled as exponential function. Thus, the hazard rate for person i in the Cox model can be written as:

$$\gamma_i(t|\boldsymbol{x}_i, \boldsymbol{\beta}) = \gamma_0(t) \exp(\boldsymbol{x}_i^{'}\boldsymbol{\beta}) \tag{4}$$

The coefficient vector $\boldsymbol{\beta}$ can be estimated via maximum likelihood (cf. Cameron and Trivedi, 2006). The impact of a rise of the b-th covariate by one unit can be derived as:

$$\gamma_i(t|\boldsymbol{x}_{i,new}, \boldsymbol{\beta}) = \gamma_0(t) \exp(\boldsymbol{x}_{i,old}^{'}\boldsymbol{\beta} + \beta_b) = \exp(\beta_b)\gamma_i(t|\boldsymbol{x}_{i,old}\boldsymbol{\beta}) \tag{5}$$

The factor $\exp(\beta_b)$ is referred to as hazard ratio. Equation 5 highlights one crucial assumption of the Cox model: the Hazard Ratio is time invariant, thus the proportional impact of the b-th covariate on the Hazard Rate remains constant over the entire observation period. Due to that assumption the baseline hazard drops out of the likelihood function and does not need to be specified (cf. Cameron and Trivedi, 2006).

Many of the observed completed years of schooling in the sample are right-censored as the respective persons are still enrolled in school. At this point, another merit of the Cox model comes into play. The censoring of those observations can easily be accounted for in the likelihood function (cf. Cameron and Trivedi, 2006). For all the persons who declare that being a student is their main occupation the number of completed years of schooling is considered to be right-censored. Persons with other main occupations are treated as having finished their schooling. As the current occupational status is just a snapshot, this proceeding is not unproblematic, however the dataset contains no better indication.

A major shortcoming of the Cox model in the context of the present paper is the assumption of time invariance of all covariates over the observation period, i.e. the schooling career. As only cross-sectional data is available, this assumption cannot be tested. For some covariates like the household head's educational level it can be supposed to hold. For others, the assumption of time invariance is questionable. This problem generally emerges when the educational variable is defined as years of schooling. The alternative is to interpret the whole dataset as a snapshot and consequently to use a snapshot as educational variable. Typically, the current enrollment status is employed in that context. However, it is obvious that the current enrollment status is much less meaningful as an indicator of educational outcomes than completed years of schooling are. Thus, there is the alternative to stick to the questionable time invariance assumption or to use a questionable proxy for educational outcomes. In this paper the former option is chosen.

To tackle endogeneity and selection problems concerning the migration variable, two different covariates are included in the empirical model. First, a dummy identifies all persons living in households that already have experienced migration of one or several members to the US. That dummy should capture the effects of a changing migration probability linked to the presence of a household member in the potential target country as proposed by McKenzie and Rapoport (2006) and unobserved differences between migrant and non-migrant households. Second, a variable indicating the "extent" of the household head's

absence is supposed to measure the effect of this absence on educational outcomes. Therefore, the years of the head's absence since the 7th year of the respective person's life (when school enrollment can be expected to take place) are calculated and are divided by the person's age minus five.[8] The resulting value can be interpreted as the household head's "average absence per year" over the person's schooling period. Of course, this procedure yields some shortcomings: it only captures the household head's absence, since for other members the necessary information on migration history is not available. However, as in 80% of the cases the household head is also a parent of the respective person, his absence can be expected to have stronger effects than the absence of other members. Furthermore, the constructed variable only captures one link between migration and educational outcomes that McKenzie and Rapoport (2006) discuss in their model. But it is that link that is mentioned most frequently in literature (see also Hanson and Woodruff, 2003; Acosta et al., 2006).

Remittances receipt is indicated by a dichotomous variable. As already outlined, there are several reasons to assume that self-selection among recipient households can be neglected. However, endogeneity problems are still lurking, as those transfers might be sent to compensate unobserved shocks. It is impossible to rule out this kind of endogeneity entirely, but literature offers evidence that remittances to Haiti do not increase in the aftermath of a shock (Fagen, 2006) and are instead rather long term and regular sources of income for recipients (Orozco, 2006). The model of McKenzie and Rapoport (2006) suggests that the positive impact of remittances is limited to poorer households, as only in those households budget constraints are binding. Thus, the remittances variable is additionally interacted with a poverty indicator, which takes the value of one if the asset index value of the respective household is in the lower half of the distribution and zero otherwise.

Besides the asset index and the household head's or his spouse's education, the vector of covariates contains the number of younger as well as of older persons from the same generation (siblings, cousins, stepbrothers and -sisters) in the household divided by the total number of household members. Persons from the same generation are likely to compete for household resources dedicated to education. Thus their relative number might affect educational outcomes. Younger and older persons are considered separately, as birth order has been found to play an important role in that context in developing countries (Buchmann and Hannum, 2001).

Furthermore, the year of birth, gender (in form of a dummy that takes on the value of one for women), a dummy to indicate whether the considered person is not a direct descendant from the household head (child or grandchild) and the above-mentioned "kindergarten-dummy" are included.

Clearly, some of the included covariates bear the risk of not being time invariant. We have no information on when recipient households started obtaining remittances or if non-recipient households ever obtained them in the past. Fur-

[8] It would be more appropriate to calculate the divisor as the person's age minus six, as the school enrollment is expected to occur at that age. However, as some persons in the sample are six years old, the divisor would be zero in that case.

Table 5: Descriptive statistics of the included covariates

Covariate	Sample mean	Sample standard deviation
$\text{Rem}_j^a(\text{D})^b$	0.5167	0.5004
Rem*Pov_j(D)	0.2222	0.4163
Mig_j(D)	0.1917	0.3942
Absence_i	0.0489	0.1921
AssetIndex_j	−0.0580	2.0166
Younger_i	0.2115	0.1880
Older_i	0.2060	0.1880
EducHead_j	9.0500	4.1279
YearofBirth_i	–	–
Gender_i(D)	0.5056	0.5007
Kindergarten_i(D)	0.3028	0.4601
NoDescendant_i(D)	0.1306	0.3374

[a] i is an indiviadual, j a household indicator.
[b] The supplement (D) indicates a zero/one dummy variable.

thermore, the time invariance of the asset index is questionable as its value changes whenever the household acquires a new asset. However, as already mentioned, remittance flows to Haiti have been found to be quite stable and the asset index proxies permanent rather than present income. Thus, the assumption of time invariance for those variables might be daring but not necessarily unrealistic. The situation is different for the variable measuring the number of younger persons from the observed person's generation in the household. It cannot be time invariant when those younger persons were born *after* the observed persons school enrollment. Still, omitting the variable from the model is no appealing alternative, as the number of younger children in the household has been found to be an important factor for educational decisions.

Community membership is not modeled as a covariate, as tests for the validity of the proportional hazards assumption clearly reject the proportional impact of that covariate in this case. Instead, the Cox model is stratified on the community level. This implies that different baseline hazards are estimated for each community (see Therneau and Grambsch, 2000, p.45 for the derivation of the likelihood function in stratified Cox models). Finally, with $h = 1, 2, 3$ indicating the respective community, the empirical model can be written as

$$\gamma_i(t, h|\boldsymbol{x}_{ij}, \boldsymbol{\beta}) = \gamma_0(t, h) \exp(\boldsymbol{x}_{ij}^{'}\boldsymbol{\beta}) \tag{6}$$

with the vector $\boldsymbol{x}$ containing the following covariates, i being an individual and j being a household indicator: remittances recipient status (Rem_j), remittances recipient status interacted with poverty (Rem_j*Pov_j), migration household indicator (Mig_j), the indicator measuring the extent of the household head's absence (Absence_i), the asset index value (AssetIndex_j), the relative number of younger and older persons stemming from the respective person's

generation in the household (Younger_i, Older_i), the household head's education (EducHead_j), the year of birth (YearofBirth_i), the gender (Gender_i) the "kindergarten-dummy" (Kindergarten_i) and the dummy indicating whether the respective person is not a direct descendant of the household head (NoDescendant_i). Table 5 summarizes the sample means and sample standard deviations of all covariates.

5 Results

Table 6 displays the estimation results. The hazard ratios indicate whether a rise of the respective covariate by one unit leads to a proportional increase or decrease of the overall hazard rate. It has to be kept in mind that a hazard ratio lower than unity is associated with a positive effect on educational outcomes, as it reduces the risk of dropping out of school. The z-statistics are derived using the robust variance estimator introduced by Lin and Wei (1989). For the b-th covariate, the tested null hypothesis $\beta_b = 0$ is equal to $\exp(\beta_b) = 1$. Furthermore, Table 6 shows the 95%-confidence intervals of the respective hazard ratio.

The results for the estimates of Model 1 – this refers to the model described above – indicate a significant impact of remittances on educational outcomes. This impact is restricted to children in poorer households, as only the hazard ratio related to the interaction term differs significantly from unity. Thus, the results are in line with the theoretical model of McKenzie and Rapoport (2006). Living in a migrant household is not found to have an effect on children's schooling. The same is true for the extent to which the household head is absent. However, at this point the partly extremely high imprecision concerning the hazard ratios for some covariates needs to be highlighted. Considering the vast 95%-confidence interval of the hazard ratio estimated for the absence-variable, this imprecision becomes obvious. Consequently, it is highly doubtful whether conclusions concerning the impact of the household head's absence on educational outcomes based on the displayed estimation results should be drawn. The imprecision is likely to be due to two facts: firstly, the number of observations in the sample is relatively small, amounting to 360, of which only 52 are uncensored. Secondly, the measurement error in the dependent variable is an additional uncertainty factor.

Furthermore, the results show a strong influence of household wealth, measured by the asset index. This indicates that budget constraints might indeed play a crucial role for educational outcomes in Haiti. Given the dominance of private schools in the country and the high level of poverty, this is not at all surprising. According to Table 6, an increase of the index value by one unit reduces the hazard rate by approximately 30%. The distance between the quartiles of the asset index distribution is about 1.5 units. It is worth mentioning that a potential endogeneity problem lurks when including the asset index into the empirical model. As outlined in Section 3, Justesen and Verner (2007) observe a high dedication among Haitians to enable their children to receive a better

Table 6: Results of the Cox model estimates, stratified on the community level

Covariate	Hazard Ratio z-Statistic 95%-Confidence Interval			
	Model 1	**Model 2**	**Model 3** (clustered residuals)	**Model 4** (clustered residuals)
Rem	1.0701 0.14 [0.4129;2.7773]	0.9994 −0.00 [0.4431;2.2543]	1.0701 0.10 [0.2680;4.2727]	0.9994 −0.00 [0.3240;3.0828]
Rem*Pov	0.3822 −2.06** [0.1532;0.9536]	0.1919 −2.84*** [0.0614;0.6004]	0.3822 −1.51 [0.1101;1.3270]	0.1919 −2.24** [0.0454;0.8110]
Mig	0.4167 −1.39 [0.1213;1.4318]	0.2322 −2.35** [0.0689;0.7830]	0.4167 −1.30 [0.1108;1.5672]	0.2322 −2.08** [0.0587;0.9182]
Absence	0.8472 −0.11 [0.0433;16.5699]	0.9944 0.00 [0.0451;21.9119]	0.8472 −0.13 [0.0700;10.3151]	0.9944 −0.00 [0.0632;15.6583]
AssetIndex	0.6818 −3.82*** [0.5600;0.8300]	– – –	0.6818 −3.50*** [0.5501;0.8451]	– – –
Younger	0.7067 −0.36 [0.1069;4.6720]	0.2734 −1.43 [0.0462;1.6183]	0.7067 −0.30 [0.0732;6.8241]	0.2734 −1.40 [0.0443;1.6877]
Older	0.7957 −0.25 [0.1334;4.7470]	0.4992 −0.80 [0.9168;2.7178]	0.7957 −0.21 [0.0918;6.8975]	0.4992 −0.70 [0.0718;3.4679]
EducHead	0.9012 −2.16** [0.8201;0.9904]	0.7900 −4.41*** [0.7115;0.8773]	0.9012 −1.64 [0.7960;1.0204]	0.7900 −3.77*** [0.6990;0.8929]
YearofBirth	0.9982 −0.03 [0.8824;1.1292]	0.9490 −0.82 [0.8369;1.0762]	0.9982 −0.03 [0.8678;1.1482]	0.9490 −0.69 [0.8185;1.1003]
Gender	1.3337 0.93 [0.7249;2.4538]	1.4498 1.19 [0.7879;2.6675]	1.3337 0.94 [0.7313;2.4324]	1.4498 1.15 [0.7679;2.7371]
Kindergarten	0.4027 −1.87* [0.1550;1.0463]	0.3258 −2.41** [0.1307;0.8123]	0.4027 −1.77* [0.1472;1.1019]	0.3258 −2.36** [0.1282;0.8280]
NoDescendant	3.7161 2.12** [1.1041;12.5075]	3.1875 2.02** [1.0378;9.7898]	3.7161 1.80* [0.8875;15.5593]	3.1875 −1.71* [0.8421;12.0658]

*Hazard Ratio different from unity on the 10%-level
**Hazard Ratio different from unity on the 5%-level
***Hazard Ratio different from unity on the 1%-level
The sample contains 360 observations of which 52 are uncensored.
Ties were handled using the Efron Method.
Estimates were conducted with Stata 10.

education. If this is true, one might expect a lot of Haitian families to substitute investments in household assets against investments in their children's education, leading to a downward bias in the estimated impact of the index on educational outcomes.

Gender and year of birth do not seem to play an important role for educational outcomes. The same holds for the number of persons of the same generation in the household. The household head's education reduces the risk of dropping out of school, not being the head's direct descendant is associated with a higher risk. Not surprisingly, the hazard ratio related to the "kindergarten-dummy" that captures persons for whom the denoted number of completed years of schooling is obviously upwardly biased, is smaller than unity.

In Model 2, the asset index is removed from the list of covariates. Doing so can be motivated by the assumption that remittances do not only have a direct impact on educational outcomes, but are also used by the recipient households to accumulate further assets. In that case, there would be an indirect effect of remittances via the asset index as well. The estimation results of Model 2 display no considerable change in the remittances variables' impact on educational outcomes compared to Model 1. Still, it is only in poor households that such an impact seems to prevail.[9] Still, the interacted remittances variable is now significant on the 1%-level. The same holds for the variable measuring the education of the household head. This is not surprising, as this variable is supposed to capture the effects of the omitted wealth indicator to a large extent. However, it cannot capture wealth as adequately as the asset index, so a part of the wealth impact might be absorbed by the migrant household indicator, which turns out to be statistically significant in the specification of Model 2. This seems plausible, as migrant households can generally be found in the upper quartiles of the asset index distribution.

Model 3 is equal to Model 1, except for the calculation of the residuals. In Model 3 all residuals for members of one household are clustered before applying the variance estimator of Lin and Wei. This approach is similar to the one used by Edwards and Ureta (2003) and can be interpreted as a mean to account for the fact that unobserved household characteristics probably affect all the members of one household in the same way. Thus, one might argue, it is preferable to consider residuals on the household level rather than on the individual level. As depicted in Table 6, the point estimates of the hazard ratios remain unchanged, but the standard deviances of the estimated parameters and consequently the significance levels and confidence intervals vary. Neither the hazard ratio related to the interacted remittances variable nor the hazard ratio related to the household head's educational level is found to be significantly different from unity any more and the confidence intervals of nearly all covariates become larger. This indicates a positive correlation between intra-family residuals that leads to an underestimation of the estimated hazard ratio's standard deviances if not taken into account properly. However, if the asset index is omitted as in

[9] In Model 2, poverty is approximated by the educational level of the household head or his spouse. A household is considered to be poor if neither its head nor his spouse have completed more than six years of schooling.

Model 2, the results still suggest - despite lager confidence intervals - a significantly positive impact of the interacted remittances variable (see Footnote 9 for the definition of the interaction term in this model) as well as of the migration variable and the household head's educational level.

6 Conclusion

Using data from three Haitian communities the present paper investigates the effects of migration and remittances on educational outcomes. From a theoretical point of view, remittances can be supposed to have positive effects in poor households, as they alleviate budget constraints. Given the dominance of private facilities in the Haitian educational system and the high poverty rate prevailing in the country, budget constraints are likely to play an important role for educational outcomes. Migration in turn is associated with rising duties for children in the household and the loss of parental role models as well as with declining returns to schooling. Thus, migration is expected to affect educational outcomes negatively.

The fact that the number of households in the LAMP dataset reporting to receive remittances is considerably higher than the number of migrant households, allows to disentangle the impacts of both phenomena in the empirical model. The results suggest a positive impact of remittances that is restricted to poorer households as predicted by theory. In contrast, no impact of the household head's absence can be detected. The idea that budget constraints are an important factor concerning educational outcomes due to high poverty and a mainly not-for-free schooling system is supported by the strong influence of the asset index.

However, considering the results of the estimate one also has to be aware of problems connected to the chosen empirical approach and the dataset. First of all, the imprecision in the measurement of the schooling variable as well as the relatively small number of observations in the sample lead to extremely vast confidence intervals of the estimators. Furthermore, it is questionable whether the condition of time invariance – that is crucial if the Cox model is applied – holds for all covariates included in the estimations. Especially assuming time invariance of the remittances recipient status seems problematic, albeit remittances flows to Haiti have been found to be relatively stable sources of income.

The collection of panel data might be an appropriate way to overcome those difficulties, at least partially. It would allow for the verification of the time invariance assumption and – if the assumption does not hold – for the use of more advanced empirical approaches like a Cox model with time varying covariates as well as the inclusion of fixed household effects. However, collecting such data is supposedly an ambitious undertaking in the Haitian environment. Alternatively, one might collect data that includes the "remittances receipt history" of each household, similar to the migration and life history already included in the LAMP dataset.

Finally, besides all concerns linked to the empirical approach, it is impor-

tant to keep in mind that this paper focuses on the impacts of migration and remittances on the generation following the one of the migrants and the remittances senders. It does not consider the effects of those persons' exit on the productivity and stock of human capital in their own generation, i.e. the effect of the so-called "brain drain". Thus, one must be aware that the issue this paper deals with only covers one of the multiple aspects playing a role when it comes to assessing whether migration and remittances are advantageous or detrimental from a developing countries perspective.

References

Acosta, P. (2006). 'Labor Supply, School Attendance, and Remittances from International Migration: The Case of El Salvador'. World Bank Policy Research Group Working Paper 3903.

Acosta, P., C. Calderón, P. Fajnzylber and H. Lopez (2006). 'Remittances and Development in Latin America'. *World Economy* 29(7), 957–987.

Acosta, P., C. Calderón, P. Fajnzylber and H. Lopez (2008). 'What is the Impact of International Remittances on Poverty and Inequality in Latin America?' *World Development* 36(1), 89–114.

Acosta, P., P. Fajnzylber and J. Lopez (2007). 'The Impact of Remittances on Poverty and Human Capital: Evidence from Latin American Household Surveys'. In: Ç. Özden and M. Schiff (Eds.), *International Migration, Economic Development & Policy*. The World Bank and Palgrave Macmillan, Washington DC, p. 59–98.

Adams, Jr., R. H. and J. Page (2005). 'Do International Migration and Remittances Reduce Poverty in Developing Countries?' *World Development* 33(10), 1645–1669.

Amuedo-Dorantes, C., A. Georges and S. Pozo (2008). 'Migration, Remittances and Children's Schooling in Haiti'. IZA Discussion Paper No. 3657.

Anh, T. S., J. Knodel, D. Lam and J. Friedman (1998). 'Family Size and Children's Education in Vietnam'. *Demography* 35(1), 57–70.

Becker, G. S. and N. Tomes (1979). 'An Equilibrium Theory of the Distribution of Income and Intergenerational Mobility'. *Journal of Political Economy* 87(2), 1153–1189.

Bratsberg, B. and D. Terrell (2002). 'School Quality and Returns to Education of U.S. Immigrants'. *Economic Inquiry* 40(2), 177–198.

Buchmann, C. (2000). 'Family Structure, Parental Perceptions, and Child Labor in Kenya: What Factors Determine Who Is Enrolled in School?' *Social Forces* 78(4), 1349–1378.

Buchmann, C. and E. Hannum (2001). 'Education and Stratification in Developing Countries: A Review of Theories and Research'. *Annual Reviews in Sociology* 27(1), 77–102.

Calero, C., A. Bedi and R. Sparrow (2009). 'Remittances, Liquidity Constraints and Human Capital Investments in Ecuador'. *World Development* 37(6), 1143–1154.

Cameron, A. C. and P. K. Trivedi (2006). *Microeconometrics - Methods and Applications*. Repr. Cambridge University Press, New York.

Chatfield, C. and A. S. Collins (1980). *Introduction to Multivariate Analysis*. Chapman & Hall, London and New York.

Edwards, A. C. and M. Ureta (2003). 'International Migration, Remittances, and Schooling: Evidence from El Salvador'. *Journal of Development Economics* 72, 429–461.

Fagen, P. (2006). 'Remittances in Crises. A Haiti Case Study'. HPG Background Paper.

Filmer, D. and L. Pritchett (1999). 'The Effect of Household Wealth on Educational Attainment: Evidence from 35 Countries'. *Population and Development Review* 25(1), 85–120.

Filmer, D. and L. H. Pritchett (2001). 'Estimating Wealth Effects Without Expenditure Data–or Tears: An Application to Educational Enrollments in States of India'. *Demography* 38, 115–132.

Hanson, G. H. and C. Woodruff (2003). 'Emigration and Educational Attainment in Mexico'. Working Paper.

International Bureau of Education (2006). 'World Data on Education, 6th edition'.

Justesen, M. and D. Verner (2007). 'Factors Impacting Youth Development in Haiti'. World Bank Policy Research Group Working Paper 4110.

Lin, D. Y. and L. J. Wei (1989). 'The Robust Inference for the Cox Proportional Hazards Model'. *Journal of the American Statistical Association* 84(408), 1074–1078.

Lloyd, C. B. and A. K. Blanc (1996). 'Children's Schooling in Sub-Saharan Africa: The Role of Fathers, Mothers, and Others'. *Population and Development Review* 22(2), 265–298.

López-Córdova, E. (2005). 'Globalization, Migration, and Development: The Role of Mexican Migrant Remittances'. *Economía (Journal of the Latin American and Caribbean Economics Association-LACEA)* 6(1), 217–256.

Lucas, Jr., R. E. (1988). 'On the Mechanics of Economic Development'. *Journal of Monetary Economics* 22, 3–42.

McKenzie, D. (2005). 'Measuring Inequality With Asset Indicators'. *Journal of Population Economics* 18, 229–260.

McKenzie, D. and H. Rapoport (2006). 'Can Migration Reduce Educational Attainment? Evidence from Mexico'. World Bank Policy Research Group Working Paper 3952.

Ministère de l'Education Nationale de la Jeunesse et des Sports (2004). 'Le Développement de l'Education'. Rapport National d'Haiti.

Minujin, A. and J. H. Bang (2002). 'Indicadores de Inequidad Social. Acerca del Uso del "Indice de Bienes" Para la Distribucion de los Hogares'. *Desarrollo Económico* 42(165), 129–146.

Orozco, M. (2006). 'Understanding the Remittance Economy in Haiti'. World Bank Working Paper.

Pradhan, M. (2001). 'Welfare Analysis with a Proxy Consumption Measure: Evidence from a Repeated Experiment in Indonesia'. Cornell Food and Nutrition Program Working Paper No. 126.

Psacharopoulos, G. and H. A. Patrinos (2004). 'Returns to Investment in Education: A Further Update'. *Education Economics* 12(2), 111–134.

Ratha, D. and Z. Xu (2008). *Migration and Remittances Factbook 2008*. The World Bank, Washington DC.

Romer, P. M. (1986). 'Increasing Returns and Long-Run Growth'. *The Journal of Political Economy* 94(5), 1002–1037.

Sahn, D. E. and D. Stiefel (2003). 'Exploring Alternative Measures of Welfare in the Absence of Expenditure Data'. *Review of Income and Wealth* 49(4), 463–489.

Salmi, J. (2000). 'Equity and Quality in Private Education: the Haitian Paradox'. *Compare: A Journal of Comparative Education* 30(2), 163–178.

Taubman, P. (1989). 'Role of Parental Income in Educational Attainment'. *The American Economic Review* 79(2), 57–61.

Taylor, J. E. (1992). 'Remittances and Inequality Reconsidered: Direct, Indirect, and Intertemporal Effects'. *Journal of Policy Modeling* 94(5), 187–208.

Taylor, J. E., J. Mora, R. Adams and A. Lopez-Feldman (2005). 'Remittances, Inequality, and Poverty: Evidence From Rural Mexico'. Department of Agricultural and Resource Economics University of California, Davis, Working Paper No. 05-003.

Therneau, T. M. and P. M. Grambsch (2000). *Modeling Survival Data – Extending the Cox Model*. Springer, New York.

Verner, D. (2008). 'Making Poor Haitians Count – Poverty in Rural and Urban Haiti Based on the First Household Survey for Haiti'. World Bank Policy Research Working Paper 4571.

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