Ifo Institute – Leibniz Institute for Economic Research at the University of Munich

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Ifo Working Paper No. 187

September 2014

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Financing Student Migration: Evidence for a Commitment Problem[☆]

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Abstract

This paper develops and tests a model of profit-sharing arrangement over returns to a student migration investment. Taking advantage of a unique dataset on Cameroonian students, I find evidence of non-commitment bargaining between student, parents and an outside helper. The commitment problem arises because the coalition of parents and student has strong incentives not to abide by the outcome of the *ex ante* negotiation with the helper. This finding suggests some inefficiency of the decision process, in that students from credit-constrained families might not benefit from the support of a helper, even though the returns to their migration can be significant.

Keywords: Student migration, bargaining, commitment
JEL: C71, I25, J61.

1. Introduction

For students from developing countries wishing to study abroad, the potentially higher costs of living and higher tuition fees in foreign countries make the budget constraint particularly important in the migration decision(Rosenzweig, 2008). Empirical and theoretical literature on student mobility suggests that students from developing

[☆]Financial support by the Leibniz Association (SAW-2012-ifo-3) is gratefully acknowledged. I am grateful to Domagoj Babić for capable research assistance, and to Christa Hainz, Panu Poutvaara and the participants of the CEMIR-Workshop 2013 for helpful discussions.

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countries are very likely to rely on the help of several members of their family, their community, and the Diaspora during their migration (henceforth "helpers".[1] Thus, these helpers would appear to be very important and yet, very little is known about their characteristics or incentives.

This paper develops and tests a model of profit-sharing arrangement between a student, parents, and an outside helper over returns to a student migration investment. The aim is to understand how the families in developing countries organize to manage migration expenses. In particular, the analysis sheds light on the participation incentives of a helper who is neither the father nor the mother of the migrant.

An important aspect of the analysis is the investor's capacity to commit *ex ante*, to *ex post* redistribution of profits. If *ex ante* commitment is possible, sharing of profits is decided before migration and the agreement is assumed perfectly enforceable. In this case, a helper's participation decreases monotonically with family capital, provided an agreement is reached. Given the institutional context in many developing countries, however, perfect enforceability of contracts might not be entirely possible. In the case of student migration, the outside helper faces the standard hold-up problem, in that, after the student migration costs are sunk, the coalition of parents and child might want to renegotiate the *ex ante* agreement. When it assumed assumed that perfect commitment is not possible, the model predicts that a helper's participation does not depend monotonically on the family capital, but exhibits a hump-shaped relationship.

I test the model's predictions against the data from a survey on a sample of Cameroonian students, aged 18 or more, who completed secondary school, thus obtaining the "Baccalauréat".[2] Respondents either migrated to obtain tertiary education (among other reasons) or remained in Cameroon. A key advantage of the dataset is that it provides information on the financing of the student migration, the identity

[1]For example, the importance of the family unit is underlined by Boyd (1989). A survey conducted by the Institute of International Education (IIE) in 2006 reveals that the primary source of funding is "personal and family" for about 64% of foreign students. Additional support from a preexisting social network of migrants in the destination country has also been documented (Beine, Noël, and Ragot, 2014).

[2]Similar to the French educational system, "Baccalauréat" is a state exam that must be passed before one can claim completion of secondary school.

of a potential investor who is neither father nor mother of the student, and the actual provision of support when migration takes place.[3] Thus, the dataset allows analyzing the helper's socio-economic characteristics, his or her link with the family, and the determinants of his or her participation decision.

The empirical analysis yields two central results: (1) the helper's participation does not depend on the migrating student's characteristics, and (2) the helper's participation has a hump-shaped relationship with family capital. Thus, the empirical findings are consistent with a non-commitment bargaining model.

A later section of the paper addresses a possible selection bias in our sample. If families with low capital are less likely to know helpers (those with capital sufficient to cover the migration expenses) than are families with high capital, the hump-shaped relationship might arise from an attenuation bias. To check the robustness of the results, I also test directly for a strictly monotone relationship. The test rejects the latter assumption, weakening the claim of perfect commitment.

This paper makes two contributions to the literature. First, to the best of my knowledge, it is the first to look at micro-level characteristics of helpers in student migration, and study their participation incentives. The present literature on migration networks acknowledges the importance of migrants' social ties (e.g. Beine, Docquier, and Özden, 2011a), but is mostly concerned with the effect of this network on migrant selection (Carrington, Detragiache, and Vishwanath, 1996; Winters, De Janvry, and Sadoulet, 2001; Munshi, 2003; McKenzie and Rapoport, 2007; Beine, Docquier, and Özden, 2011b; Elsner, Narciso, and Thijssen, 2013). The contribution of this paper is the identification of the characteristics and incentives of one important contributor in the student migration process.

As a second contribution, this paper develops and tests a model of profit sharing over returns to student migration. The model includes an explicit family decision-making process over whether to sponsor a student migrant. The results provide evidence of a non-commitment bargaining between the parents and an outside helper. The commitment problem alters the helper's investment incentives, and has implications for the efficiency of the student migration investment, as well as consequences for the distribution of realized profits (Lundberg and Pollak, 2003; Basu, 2006). In this

[3]This particular investor will be called the "helper" throughout the paper.

respect, the present analysis is similar to that of Rasul (2008) and Mazzocco (2007) who show the lack of commitment mechanisms in the context of intra-household fertility decisions, and intra-household intertemporal resource allocation, respectively.

The rest of the paper is organized as follows. Section 2 presents a model of student migration investment and derives predictions about the helper's participation under perfect commitment bargaining between both parties as well as under a non-commitment bargaining. Section 3.2 describes the background of student migration in Cameroon, the dataset, and provides some insightful descriptive statistics. Section 4 tests the model's predictions against the real-world data. Section 5 contains some concluding remarks about the implications of the findings. Technical derivations and proofs can be found in the appendix.

2. Models of Benefit Sharing

The model describes the student migration investment decision as a family investment decision within a human capital framework. To cover the costs of student migration, the student and the parents might need external financing. One option is to enter into an investment agreement with a co-investor from the extended family or the community, this person who I call the helper. This person can either accept or decline the invitation to participate in the investment. In the following, I characterize the helper's participation decision under two alternative assumptions about the decision-making process: (i) a perfect-commitment bargaining assumption and (II) a non-commitment bargaining assumption.

2.1. Student Migration Investment

Suppose a family i which consists of a student who is considering migration, and the student's two parents. The family has capital K_i. The student has certain observable characteristics X_i (e.g. gender, education, previous academic results) that determine the return to migration. When the student reaches the tertiary level of education, the family has the opportunity of making an investment of level I, known and fixed across families, by financing the child's continuing education in a foreign country. The expected return on this investment, say $r(X_i)$ depends on the student's characteristics. If $K_i < I$, however, the family must borrow capital in order to make

the investment. Denote as r_0 the interest rate for borrowing on the financial market. Assume also that there are other investment alternatives with an interest rate that isdenoted as r_1. We impose $r_1 < r_0$. As in many developing countries, the interest rate spread $(r_0 - r_1)$ is relatively high. For Cameroon, the annualized interest rate spread for "tontines", the most method of private financing is estimated at 20%. Note that $r(X)$ is typically lower than r_0, so that no one would finance migration entirely through borrowing on the financial market. However, the model does not impose this assumption. Having knowledge of the interest rates, the family chooses the investment alternative to maximize its net profit Π_i (to simplify notation, the subscript i is dopped in what follows). The net profit of student migration for the family can be written as:

$$\Pi = (r(X) - r_1) I + (r_0 - r_1) \min(K - I, 0) \tag{1}$$

The first part of the profit is the return generated by the investment; the second depends on the loan repayment. For parents who have less capital than is needed for the investment, having a helper is a cheaperway of financing the investment. For this informal financing to take place, however, the parents and the helper need to reach an agreement on how the benefits will be shared.[4] The next sections investigate predictions from the alternative assumptions about the decision-sharing mechanisms mentioned above.

For ease of exposition and when it is clear from the context, I will refer to the coalition of parents and the student migrant simply as only to parents.[5] To derive

[4]Note that it is assumed for the sake of simplicity that it is always cheaper for the family to invest all its available capital, than to choose a lower level of investment and "borrow" from the helper. In other words, the decision being modeled here is the one on how to share the profit given the family's capital, rather than the one about what level of capital to invest. This assumption is not completely innocuous; however, I maintain it for two reasons. First, itremoves the necessity for additional cumbersome algebra that adds very little insights to the results. Second, given the risk-free framework, the only case where the parents would have an incentive to invest less than the available capital is when they plan to default in repaying the amount borrowed from the helper. However, it seems plausible that the helper (often a member of the extended family) can observe the family capital overtime. The helper would then interpret an underinvestment as a signal of later repayment default, and negotiations would break down. Nevertheless, the predictions derived from relaxing this assumption would be interesting to explore, in the event richer data becomes available.

[5]Ideally, all three agents' behaviors should be analyzed separately. However, I need to merge

the predictions, I focus on parents who contemplate borrowing on the formal financial market to finance the migration investment as the alternative to an arrangement with the helper. Another possible option is for parents not to invest in migration and instead invest their capital in the home country at the rate r_1. I briefly discuss the difference in predictions between the two frameworks.

Finally, I assume throughout the remainder of the paper that the helper's propensity to participate in the student migration investment increases with increasing profit, and conversely, decreases with decreasing profit.More specifically, the helper's participation decision can be thought of as a threshold-crossing model, that depends on two terms: Π_h the helper's expected profit from investment, and ν, a latent variable that represents the unobserved taste for non-participation or unobserved private costs of participation related to family history. The helper invests in the student migration if $\Pi_h \geq \nu$. In a more generalized version, the helper participates if $\Pi_h + f(X_i, X_h) \geq \nu$, where $f(X_i, X_h)$ is a function of family and helper characteristics. This case is discussed in Section 4.4.

2.2. Perfect Commitment Bargaining

Here, I investigate the predictions of Nash bargaining with perfect commitment. The commitment is perfect in the sense that each participant complies *ex post* with the terms of the agreement. That is, the parents always share the profit from the investment with the helper according to the sharing rule agreed upon prior to the migration event.

Let μ represent the bargaining power of the helper, and $1 - \mu$, the bargaining power of the parents. μ can depend on K. Denote by r_h the interest rate for an alternative investment by the helper. r_h characterizes the helper's outside option. Under the assumption of perfect commitment bargaining, the family shares the excess return produced by the joint investment abased on each party's bargaining power. The optimal sharing rule solving the agents' problem, as well as the amount of the helper's profit are derived in Appendix A.1.

If the parents' capital is below some threshold $\tilde{K}$, no agreement can be reached.

parent and student decisions, since the dataset is relatively small and non participation of the parents is rare in the data.

When an agreement is made, the helper can capture part of the benefit the family makes from financing itself outside the formal financial market. With respect to the helper's gain, the Nash bargaining framework with perfect commitment generates the following set of predictions.

Prediction 1 (perfect commitment bargaining). *Under the assumption of perfect commitment and for $K \geq \tilde{K}$, the helper's gain and thus participation in the student migration in the Nash bargaining model is:*

- *independent of the return on the student migration investment,*
- *negatively correlated to the parents' capital, as long as $r_h < r_0$ and $\mu'(K) \leq 0$,*
- *negatively correlated to the outside investment option of the helper.*

Appendix A.1 shows that in the case of perfect commitment bargaining, an agreement is very likely when the parent has sufficient incentive to invest in migration. I therefore ignore the threshold $\tilde{K}$. The first prediction, that the helper's profit does not depend on the returns to the student migration, is the consequence of the outside option of the parents. Recall that in the present setup, the analysis is restricted to parents who will invest in migration, irrespective of the helper's participation decision. Given that the helper offers the cheapest option, the parents are willing to share part of the return. The amount that the helper can capture depends on the surplus realized by financing the remaining expenses at a lower interest than the market, but large enough to incentivize helper's participation. Hence, helper's profit depends on the gap between r_h and r_0. Note that this prediction isdistinctively the result of the (Nash) bargaining framework. If for example, the proceeds of the investments are to be divided based on an exogenous sharing rule or proportionally to the amount invested, one can easily show that the helpers' gain will depend positively on the returns to the student migration investment. Moreover, if the parents' outside option is to not invest in student migration, the helper's gains will again depend positively on the returns to the investment. Finally, the independence between the helper's participation and the return on the student migration investment is incompatible

with a common-preference model à la Becker (1973). This strong prediction of the bargaining framework will be tested against the data.

The second prediction, that the helper's profit decreases with increasing family capital, follows from the fact that the helper's contribution is of decreasing importance, compared to the outside option of alternative financing r_0. Thus, the helper receives a smaller share of the total returns. The condition $\mu'(K) \leq 0$, that is that the helper's bargaining power decreases with increasing capital contributed by the parents is intuitive. The second condition $r_h < r_0$ is very likely to be satisfied in Cameroon. As we discussed earlier, the interest rate spread in that country is relatively large.[6] This prediction would hold even if the parent's outside option is to not invest in student migration.

The third prediction is trivial.

2.3. Non-Commitment Bargaining

This section relaxes the assumption that investors will comply with the terms of the investment agreement. Specifically, I assume that the student and the parents can decide not to share the profits of the student migration investment with the helper. ThThis is a credible scenario and one that is discussed in more detail in Section 3.1. In the present framework, I introduce the possibility that the student and parents keep all of the investment returns, once the investment costs are sunk. In addition, it is assumed that they are able to punish the event the helper chooses not to participate, an assumption based on the existence of social norms about providing assistance to fellow members of the community. The stronger the social link between helper and parents, the stronger the potential for the parents to punish the helper for not helping. However, the helper will be able to punish the parents at least to some extent, for not complying with the terms of the investment agreement, again based on the assumption that there are social rules and pressures that enforce informal contracts by linking repayment to the debtor's reputation in the community. The bargaining problem with imperfect commitment is similar to the case with perfect commitment, except that, when the two parties cooperate but cannot commit to

[6] One could even allow r_0 to be decreasing with K, without the results being affected. As long as the slope is not too steep, more precisely $|r_0'(K)| < r_0(K) - r_h$, the result remains unaffected.

future plans, an agreement is feasible only if the two agents are better off with the student migration investment than in any state of nature relative to the available outside option (Mazzocco, 2007).

The optimal sharing rule solving the agents' problem, as well as determining the amount of the helper's profit are derived in Appendix A.2. If the parents' capital is below some threshold K^*, no agreement can be reached. If an agreement is feasible, the model leads to the following predictions about the helper's participation:

Prediction 2 (bargaining framework with imperfect commitment). *Under the assumption of imperfect commitment, and for $K \geq K^*$, the helper's gain and thus participation in the student migration in the Nash bargaining model is:*

- *independent of the return on the student migration investment.*
- *first weakly increasing with the parents' capital, then weakly decreasing with the parents' capital, as long as $r_h < r_0$, $\mu'(K) \leq 0$ and the costs are strictly positive and bounded above by I (hump-shaped relationship).*
- *negatively correlated to the helper's outside investment option.*

Again, the helper's profit does not depend on the return to the investment, because of the same arbitrage taking place between the outside options. The most distinctive prediction is the hump-shaped relationship between the helper's gain and the parents' capital. The relationship is characterized by four regions that are instructive to study. *First region.* There is a threshold K^* below which the negotiations will always break down. That is no sharing rule can make both parties better off than any of their outside options. The parents will never abide by the terms of the agreement and will keep all the proceeds of the student migration. The helper, foreseeing this unfavorable outcome, will rather be punished for non-participation than invest the necessary capital. *Second region.* When the family's capital increases above this threshold, the level of expenses that the family cannot cover decreases. Recall that the helper's investment is a financial loss incured in order to avoid a more costly punishment. The helper's profit is the difference between the non-participation punishment and the amount of money invested (and lost to the parents). Thus, as the

investment required from the helper decreases, the helper's profit increases. Until the point where the helper becomes indifferent between losing the return on migration and being punished by the parents for non-participation in the investment. This defines the region where the helper's participation increases with the family's capital. *Third region.* With a further increase in the family's capital, above the helper's indifference point and below the parent's indifference point, the helper's profit is based on the helper's bargaining power as well as on the helper's retaliation power. The helper's profit is the proportion of the return that can be captured thanks to the threat of retaliation. *Fourth region.* Finally, above the threshold where the parents are indifferent between keeping all the returns on the investment and undertaking the entire investment themselves, the helper's profit will decrease with the family capital, as in the two previous models. Figure 1 summarizes the relationship between family capital and the helper's profit.

Note that the "hump-shaped relationship" would still occur, even if the parents' outside option is not to invest in student migration. Note also that the shape of the relationship between the helper's profit and family capital crucially depends on the magnitude of C^p and C^h, that is each party's retaliation capacity. Indeed, if both costs are zero, bargaining always breaks down. When both costs are larger than the investment costs, I, the relationship is a negative one, similar to the case of perfect commitment. If the helper is the only one to be sanctioned for non-participation ($C^p = 0$), then the gain of the helper will be weakly increasing with the parents' capital. If it is only the parents who can be punished for non-cooperation ($C^h = 0$), the helper's gains are weakly decreasing in parents' capital. Since we expect significant retaliation costs that are relatively similar across parents and helpers, and bounded above by I, we might also expect a hump-shaped relationship between the helper's gain and the parents' capital.

The model provides a set of predictions that can be tested against the data. In the remainder of the paper, I focus on the empirical relation between the helper's participation and the student's and parents' characteristics.

3. Background, Data and Descriptive statistics

3.1. Background

With regard to migration from Cameroon, the ratio of skilled migrants to the population of skilled non-migrants is 17.2% (Docquier, Lohest, and Marfouk, 2007), whereas 42.3% of Cameroonian migrants in OECD countries in 2005 were highly qualified.Thus, brain drain is a serious concern for the Cameroonian State. In line with this trend of migration by the highly educated, the ratio of Cameroonian students enrolled in an OECD country to the total number of Cameroonian students was estimated at 14.5% in 2006 (IOM Report on Cameroon, 2009).

For many students from developing countries, the budget constraint is particularly important in the student migration decision and many student migrants rely on help from family members. More than half of the respondents to the survey in this paper reported the existence of a potential helper who is not their father or mother. With respect to the context in which an agreement to finance student migration is reached, at least four features are important for the analysis. First, agreements to finance student education abroad mostly take place in an informal, family context, meaning that no legal and enforceable contract is signed between the parties. Second, helpers' contributions are sometimes of an in-kind nature, for example, providing accommodation upon arrival, helpingwith obtaining student visa or providing help and insurance in time of needs.[7] Repayment is also expected to take place informally, for example, a successfully established student migrant may be expected to provide support or accommodation in the event a member of the helper's family decides to migrate. This type of contributions is difficult to formalize in a written contract. Third, the information asymmetry can be very large between helper and family. The physical distance makes it likely that the student migrant cannot be easily monitored and thus could convey false or inferquent information regarding the return to his or her migration. This could discourage helpers who do not live in the destination country. Fourth and finally, a successful student migrant might achieve a better fi-

[7]There is anecdotal evidence that some helpers transfer money directly to the student's bank account for a few months to ensure that the student meets the minimal financial requirement imposed by many host countries, during the screening process performed by embassies or consulates.

nancial position and thus have a strong incentive to renegotiate the contract[8] That the occurrence of one or more of these results in events the standard hold-up problem and alters the helper's participation is the main claim of the paper, the following empirical analysis provides evidence in support of it.

3.2. Data Description

I use information from a survey conducted among the population of Cameroonian students that was aimed at studying the determinants of student migration from Cameroon. An interesting feature of this dataset is that it includes first-hand information from both migrants and non-migrants. The survey, "Migration des jeunes Camerounais après le baccalauréat" (Migration of Young Cameroonians After High School), was conducted between March and May 2011. The population of interest was Cameroonians aged 18 or more who had completed secondary school by obtaining the "Baccalauréat." Respondents provided information about (i) their education, (ii) their migration history or plans, (iii) the way migration is or would be financed; (iv) socioeconomic characteristics of their parents and siblings, and, key for this paper, (v) the socioeconomic characteristics of an individual who could be designated as a helper in a (potential or actual) migration process.[9] The self-assessed sharing of migration costs addressed three types of these costs: education, travel, and accommodation. For each type of cost, the respondent was asked about the identity of contributors and the shares undertaken in covering the expenses.

The dataset includes information on both migrants and non-migrants. The student migrants used in this study are those with one year or more of education in a foreign country. Participants in the survey were selected through a chain-referral sampling methodology. Each participant answered an online questionnaire and was asked to invite other participants. More details on the survey are available in Appendix

[8]Chen, Conconi, and Perroni (2007) present a similar argument in the context of couple migration. If couple migration occurs, the partner who has the largest return to migration is in a better financial position *ex post*, and might decide to renegotiate the division of household surplus.

[9]Because of concerns related to length of the survey (on average 15 to 20 minutes) and drop-out rates (one fifth of the questionnaire where not fully completed), the survey asked about only one helper. However, it is possible that a student could be financed by more than one helper. I do not address this case here because of the data restriction.

B. Because of the peculiar sampling scheme, some caution is warranted regarding the representativeness of the sample. Chain-referral online sampling is a cheap and efficient way to overcome geographic challenges and lack of prior information on the population of interest.[10] However, it comes at the cost of needing complex correction schemes and strong assumptions to correct for biases induced by non-random sampling and non-response of invitees (see Kolaczyk, 2009, Chap 5). In the present exposition, I present raw descriptive statistics about the sample, along with adjusted descriptive statistics that accounts for different inclusion probabilities for respondents.[11] Although the adjusted estimates should be less biased and, therefore, closer to reality than the unadjusted ones, no claim of representativeness is made. When available, the adjusted estimates are compared with official data. Nevertheless, the validity of the subsequent econometric analysis on helpers' participation decisions should not be affected by the different sampling weights. Indeed, the probability of being included in the survey is arguably exogenous to the helper's participation, once all other characteristics are controlled for, especially migration and measures of family capital (see Cameron and Trivedi, 2005, pp. 818-821).

3.3. Who Migrates for Education?

Student migrants and non-migrants are similar age-wise, but migrants appear to obtain their secondary school degree one year earlier than do non-migrants (see Table 1). This finding suggests a higher number of repeaters among the non-migrants. Migrants also pass the state exam with better grades on average and are more often

[10]The average costs for interviewing a respondent is about $5 CAD. Wejnert and Heckathorn (2008) shows comparable costs.

[11]The assumptions and estimators used to derive each respondent's inclusion probability are discussed in depth in Méango (2014), which extends a proposal by Thompson (2006). This adjustment exercise is an attempt to mimic as closely as possible the population proportions under restrictive assumptions; that is to reproduce the population proportions that would most likely generate the observed sample, if the sampling behavior of agents was known to follow a given set of assumptions. The most important assumptions are the following: (i) the probability that any two individuals in the population would know each other is the same (the standard Erdős-Rényi model) and (ii) a host invites at random an observed proportion of the people he knows in this population, a standard assumption in the literature on chain-referral sampling (see Heckathorn, 1997).

enrolled in special tracks.[12] Respondents are predominantly male.[13] I estimate that at least 42% leave Cameroon before obtaining any tertiary degree, and that more than a third pursue at least four years of study abroad.

Parents of migrants seem to differ from the parents of non-migrants (see Table 2). First, both mothers and fathers of migrants seem to be more likely to have migrated than other mothers and fathers. In addition, their level of education is significantly higher than the education of their counterparts, with more than half the mothers of migrants having tertiary education (compared to one-quarter of non-migrants' mothers) and close to half the fathers of migrants holding a Master degree (compared to one-third of non-migrants' fathers). Measures of family capital reveal that the families of migrant students have more physical capital than to non-migrant families.

To further assess the determinants of student migration, I estimate a reduced-form probit equation of the probability to migrate for education, for families where a helper is declared. The explanatory variables are sorted into three groups: the student's characteristics, the parents' characteristics, and the helper's characteristics.[14] Column (1) of Table 3 reveals that student migration decisions are strongly correlated to the student characteristics, mostly with the expected sign[15]. In line with Méango (2014), students who passed their Baccalauréat exam with higher than average grades and students who attended special tracks are more likely to migrate after high school. Once these two characteristics are controlled for, older students are more likely to migrate. Female students seem less likely to migrate than are male students. The family's characteristics and the helper's characteristics also appear correlated with

[12] A screening phase takes place two years before the exam. The best students are guided to special tracks ("série C" and "série E") in which mathematics and science subjects are emphasized.

[13] UNESCO data on enrollment in tertiary school in Cameroon reveals a similar ratio of female - between 38% and 41% from 2002 to 2006.

[14] This exercise is mostly suggestive, first, because we assume our adjustment procedure to retrieve the true sampling weights, and second and most importantly, because it reveals only correlation and no causal relationship.

[15] Only the mother's education appears with a surprising sign. Students with highly educated mother appear less likely to migrate once we control for other characteristics of the family. This might be an artefact of endogeneity. Mother's education might be correlated with educational attainment of the respondent, not included in the regression.

the migration decision, particularly, the mother's education and the family's physical capital ownership (approximated by the car ownership). The helper's education and physical capital ownership also appear important.

3.4. Who Supports the Costs of Migration?

Table 4 shows that the family is highly involved in financing the cost of education (local or foreign). In more than half the cases, these expenses are borne (or expected to be) by the family. There is a big difference between investments in local and foreign studies when it comes to the identity of the payers, however. The costs of education in Cameroon are shared in only 5% of families whereas for education abroad, they are shared between family members in 40% of the cases. It is therefore of great interest to understand how families organize to make this investment.

3.5. Who Is the Helper?

In the questionnaire, student migration expenses are divided into three categories, travel, accommodation and tuition. Each respondent is asked whether an individual, other than the parent has paid/will pay/would have paid part or the total of these expenses. Respondents are then asked to provide information about one potential helper in the student migration investment[16]. Helpers (potential or effective) are declared in more than half of the families (56%). According to Table 5, this helper is usually a male, with higher education, who resides in the country of migration. In 82% of the cases, the declared helper a sibling of either the parents or the student. From the 130 migrant families where a helper is declared and the student migrates, we can observe a contribution from the helper in 68 families. The main contributions provided by the helper are for accommodation and travel expenses.

[16]The exact question was formulated as follows: "The objective of this section is to identify an individual (except the parents) who have helped/ will help/would have been able to help in the moigration process. Examples: an uncle who has the means to pay your journey to the migration country, your sister who can provide accommodation during your stay abroad, a friend of the family who pays part of the tuitions. Important: please account for any person who has helped/will help/could have helped significantly in migration process even if she has not provided any help, or would not provide any. When no one fits this requirement, please select 'not applicable'."

4. Results

This section tests the prediction of the bargaining models about helpers' participation decisions. To gain a first insight into these, Section 4.1 estimates a reduced-form probit equation explaining the helper's participation decisions by the student's, family, and helper's characteristics. Turning attention to the hump-shaped-relationship which is the most distinctive feature of non-commitment bargaining, in Section 4.2 and Section 4.3 I propose two complementary alternatives to assess the hump-shaped relationship between the helper's participation and the family's capital. Each alternative has its merits.

The first alternative is the most direct one. It consists of running a reduced-form probit regression using an approximation of family capital, and accounting for potential non-linearity. This procedure estimates the relationship between the two variables. The drawback of this methodology is its sensitivity to the problem of sample selection.

The second alternative tests an empirical implication of the bargaining with perfect commitment models, namely that the relationship of interest is a (strictly) negative correlation. Testing this prediction translates into an easily implemented test of moment inequalities. This approach has the relative advantage of circumventing the selection problem, but remains inconclusive unless one assumes some knowledge as to the direction of the sample selection.

Previewing the results, the estimates from the reduced-form probit regression produce the expected humped-shaped relationship. Furthermore, the test rejects the null hypothesis that the helper's participation is strictly decreasing with the family capital. Thus, both methodologies tend to validate the predictions from imperfect commitment bargaining framework.

4.1. Reduced-Form Probit Regression

Because the helper's actual contribution to the migration investment is observed only if migration occurs, the analysis is limited to the 130 families in which student migration is observed. I use a non-weighted regression, since there is no concern that the helper's participation would have directly influenced sample inclusion probability. The results of the probit regression are summarized in Table 3, Columns (2) to (4).

The main lessons from this exercise can be summarized in three points. First, the helper's participation decision is not correlated to the student's characteristics. Neither the measures of student's quality, nor the other demographic characteristics of the child (with the notable exception of the age at high school completion) seem to influence the helper's involvement, although they are important determinants of the migration spell (see Column (1) of Table 3). Consistent with the prediction of the bargaining framework, it appears that the returns to student migration play no role in the helper's decision.

Second, and oddly, neither do family characteristics appear to be relevant to the participation decision. This result is inconsistent with the perfect commitment bargaining story, which predicts that is the wealthiest families (highly educated parents and substantial physical capital) that will experience less assistance. When it comes to the non-commitment bargaining prediction of a hump-shaped relationship, it could be expected that the reduced-form specification will not capture it. Further specifications that should reveal whether this particular prediction is confirmed in the data are studied below.

Third, only the helper's characteristics seem to determine his or her participation; most importantly: education, gender, and being a sibling of the student. Note that the framework with imperfect commitment offers the most suitable interpretations of the range of effects observed in the regression. The negative effect of the highly educated helper makes sense if one assumes, plausibly enough, that highly educated helpers have access to better outside investment options than do less well educated helpers. The fact that women participate less often than men could reflect gender roles in the Cameroonian society. The cost of nonparticipation for a helper who is a sibling of the migrant can reasonably be thought as very high, explaining the positive significant effect of this variable on participation. Conversely, uncles and aunts do not seem to be punished much if they decide not to participate in the investment. The parents have less coercive power over their brothers and sisters than they do over their own children. Furthermore, that helpers in the migration country are more willing to participate makes sense if it is assumed that they have better opportunities to monitor the migrant and avoid default by the debtor. All these interpretations are in line with the non-commitment bargaining model. The main challenge now is to test the hump-shaped relationship between the helper's participation and family

capital.

4.2. Accounting for Non-Linearity

First, note that family capital is not observed. Nevertheless, several other aspects from which the level of family capital can be determined are observable. the following variables (observable) are important predictors of family wealth: the education of the household head, car ownership, and the size of the family. I construct through these variables an ordinal classification of families so as to distinguish them based on their capital. I create eight family types, which are combinations of the aforementioned variables (see Table 6).

The highest type (Type 7) corresponds to the richest families (those with at least one highly educated parent, owning at least one car, with a maximum of three children), the lowest (Type 0) to the poorest families (low educated parents, no car, and four or more children).

Column (1) of Table 7 summarizes the results of the regression with ordered types of families (including both helper's and student's characteristics). Relative to the reference group (Type 0), the coefficients associated to the family type display first an increasing pattern in lower types, then a decreasing pattern in higher types. The coefficient associated to the intermediary family type is significantly different from 0 at a 10% level. Because of the small sample size, the same analysis is undertaken but this time excluding student characteristics, since the theoretic model predicts that they should not affect the participation decision. The results, displayed in Column (2) of Table 7 support the hump-shaped relationship with stronger statistical significance of the estimated parameter. Relative to the reference group, the coefficients associated to the family type display first an increasing pattern in lower types, then remain relatively constant (weakly decreasing) in higher types. Thus, the hump shape predicted by the bargaining model with imperfect commitment is confirmed by the data.

One threat to the robustness of my conclusion is that richer families might have better connections with other richer families, thus allowing students from less-credit-constrained families to declare a helper more often than students from more-credit-constrained families. If this selection is important on the unobservable measures of capital, the more-credit-constrained families that we observe investing in student mi-

gration will have larger unobserved characteristics related to their capital than the former. The consequences of this would be an attenuation bias, that is, coefficients associated to families with smaller types will be biased toward zero. If selection is indeed a serious issue, it would explain the seeming irrelevance of student characteristics to the helper's participation decision, as well as the non-significance of the coefficient relative to more-credit-constrained families.

In practice, it is difficult to fully address this concern. To use the traditional IV methodology, an exclusion restriction is needed, that is, a variable influencing the existence of a helper and, at the same time, independent of the participation decision. No such variable is available in our context. Nevertheless, there is a way to circumvent the endogeneity problem, which will be explained in the next section. First, however, it is appropriate to mention why I believe that endogeneity does not entirely drive our results.

First, the question employed to identify the existence of a helper does not specify any monetary threshold for the declaration of a helper. Indeed, the accompanying examples suggested that even modest but significant contributions could be considered. Second, even if attenuation bias is responsible for the results, it is difficult to make sense of the parameters associated to the helper characteristics. Neither the common-preference framework nor the bargaining model with perfect commitment can satisfactorily account for the differences between the participation of uncles/aunts versus brothers/sisters, or males versus females. Third, recalculating the regressions while accounting for additional measures of family capital (ownership of a house and/or of a land property) does not affect the hump-shaped pattern (Table 7, column (3)). Thus, I believe that the patterns revealed by econometric regressions are not completely driven by endogeneity concerns. The results from Section 4.3 support this claim.

4.3. Testing for a Negative Relationship

As mentioned above, one can use the data to test some direct implications of a strictly negative relationship between the helper's participation propensity and the family capital, while accounting for the possibility of selection. Denote by H the helper's participation decision and by D the variable that registers whether or not a helper is declared. The selection concern in our case is that unobservables that determine family capital might have a different distribution given some $D = d$, and

$d \in \{0, 1\}$.

The prediction that the helper's participation propensity is strictly decreasing in the family capital can be written as follows:

Assumption 1 (monotonicity). *For (x_i, x_h) the set of observable characteristics of the family and the helper,*

$$Pr(Y = 1|x_i, x_h, K = k) > Pr(Y = 1|x_i, x_h, K = k') \text{ for any } k < k', \ (x_i, x_h) \quad (2)$$

In the following, the dependence on (x_i, x_h) is dropped to lighten the notation.

Assume further that the helpers who are declared are those who are the most likely to have participated in the investment.

Assumption 2 (positive selection). *Continuing with the previous notation:*

$$Pr(Y = 1|D = 1, K) > Pr(Y = 1|D = 0, K), \ K \ a.e. \quad (3)$$

In other words, a respondent's propensity to declare a helper is positively influenced by his/her evaluation of the probability that the potential helper will actually contribute to the migration investment. Under the monotonicity and the positive selection assumptions, $P(Y = 1|K)$ can be bounded as follows :

$$\max_{k>K} Pr(Y = 1, D = 1|K) \leq Pr(Y = 1|K) \leq \min_{k \leq K} Pr(Y = 1|D = 1, K), \ K \text{ a.e.} \quad (4)$$

See the proof in Appendix C. The goal is to check whether the right-hand side term in Equation (4) is lower than the left-hand side term in the same equation, in which case we say that the bounds cross. If it is the case, either the monotonicity assumption or the positive selection assumption can be rejected.[17]

To test for crossing bounds, we apply the methodology developed by Chernozhukov, Lee, and Rosen (2013). To approximate family capital, I again use the family type. Because of the limited size of the dataset and to increase the power of the test, the

[17]Note that this is a sufficient but not a necessary condition. The bounds might not cross while the assumptions are still false.

types are merged in pairs $0-1, 2-3, 4-5$, and $6-7$. Recall that the relationship has to hold for any w. Again, because of the limited size of the dataset, I condition on a single student characteristic at a time. From the theory, if there is lack of commitment, the decreasing relationship is not expected to hold for the lowest type, so that the test will reject the null hypothesis[18]:

$$H_0 : \max_{t \neq 0-1} Pr(Y = 1, D = 1 | Type = t) - Pr(Y = 1 | D = 1, Type = 0-1) \leq 0$$

Note that the test procedure proposed here is relatively conservative for small samples. Moreover, the null hypothesis favors the monotonicity assumption. H_0 is rejected for the lowest type at the 5% level, for families with an absent father, families without a house property, and at the 10% level for families with a student migrant to an OECD country.

To summarize, granted that the positive selection assumption is true, the test procedure rejects the monotonicity assumption. This finding strongly suggests that the selection problem does not fully account for helpers' lower participation propensity in families with low capital. The helper's participation and the family capital would exhibit a hump-shaped relationship even in the absence of selection bias.

4.4. A Further Concern

Another question is whether the reduced-form analysis captures, not only the profit generated by the sharing of the investment, but also other additional participation incentives. This would be the case with the generalized representation of the helper's participation decision, where the helper participates if $\Pi_h + f(X_i, X_h) > \nu$. $f(.,.)$ could reflect the helper altruistic attitude toward the child (see Li, Rosenzweig, and Zhang, 2010). However, this seems doubtful, since, contrary to what the data suggest, the higher the returns to migration the more prone to participate an altruistic helper. $f(.,.)$ could simply encompass some social norms (e.g. male helpers are expected to contribute more often than female helpers). However, this rationale does not explain how these norms could generate the hump-shaped relationship between family capital and helper participation.

[18] A Plug-in estimator is used for $Pr(Y = 1 | D = 1, Type = 0-1)$ as advised by Mourifie and Wan (2014).

5. Conclusion

This paper develops and tests a model of profit-sharing decisions over returns to student migration investments. The model makes explicit how the characteristics of the student migrant and his or her parents are related to the outside helper's incentives. The two central results are that a helper's participation does not depend on the student's characteristics, when we consider families where migration took place, and that the helper's participation has a hump-shaped relationship with family capital. Both results are evidence that non-commitment bargaining is occurring.. Although that analysis is restricted to families where migration always takes place, it seems natural to assume that the same commitment problems would arise even if the parents' outside option is an alternative investment in the home country.

The presence of commitment issues in social interactions is associated with inefficient outcomes (Lundberg and Pollak, 2003; Basu, 2006; Mazzocco, 2007; Rasul, 2008). Inefficiency might arise from the decision not to pursue a viable student migration investment that would have made all parties better off, in presence of an enforceable contract. It is important to understand that it will be the families with the lowest capital that are most affected by these inefficiencies. In this sense, informal financing through helpers will not provide an alternative to expensive market financing for these families unless a better contracting environment can be secured. The most-credit-constrained parents will not be able to reach an agreement with an outside investor, and might never access the investment opportunity, further disadvantaging their children. Moreover, the acuteness of the commitment problem depends on the efficiency of the retaliation mechanisms: parents seem to have a great deal of retaliation power over their own children and this power appears to be gender biased. These findings may have implications for student migration of types other than that studied here, namely, chain migration. That is, given that it appears that boys are more often expected to be helpers than are girls, gender considerations might play a role in the timing of chain migration schemes.

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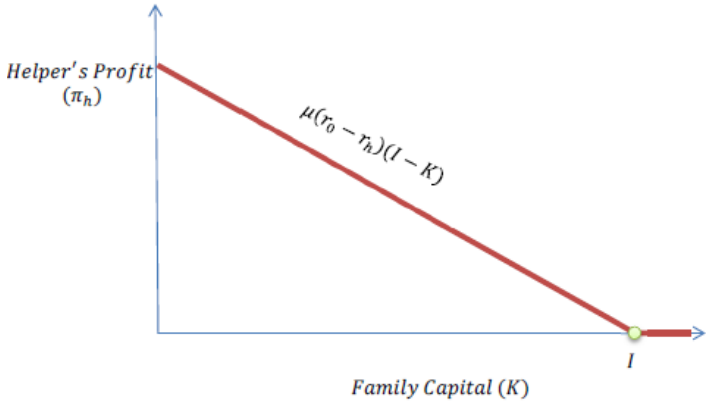
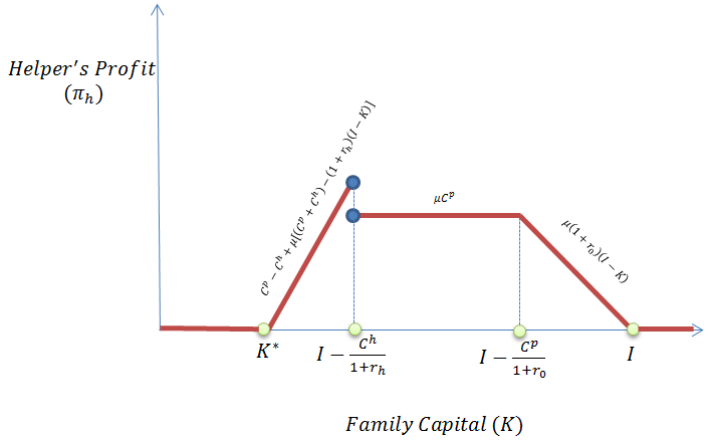
Figure 1: Graphic representation of the predicted relationship between family capital and the helper's profit.



(a) Perfect Commitment Bargaining



(b) Non-Commitment Bargaining

Table 1: Student characteristics, migrants vs. non-migrants

	Migrants		Non-migrants	
	Sample	Adj.	Sample	Adj.
Student demographics				
Female	0.47	0.47	0.38	0.46
	(0.03)	(0.03)	(0.04)	(0.04)
Age at response	27.34	24.50	27.90	25.82
	(0.34)	(0.03)	(0.03)	(0.03)
Age at Bac.	18.70	17.92	19.31	18.86
	(0.12)	(0.12)	(0.16)	(0.12)
Education				
Grade at Bac				
'Very good'	0.22	0.14	0.15	0.05
	(0.03)	(0.02)	(0.03)	(0.02)
'Good'	0.18	0.41	0.10	0.17
	(0.03)	(0.03)	(0.02)	(0.03)
Special track	0.44	0.38	0.36	0.13
	(0.03)	(0.03)	(0.04)	(0.03)
Educ. Attainment				
Baccalauréat	0.22	0.42	0.18	0.24
	(0.03)	(0.03)	(0.03)	(0.03)
Bachelor	0.36	0.32	0.65	0.56
	(0.03)	(0.03)	(0.04)	(0.04)
Master	0.35	0.20	0.14	0.05
	(0.03)	(0.03)	(0.03)	(0.02)
PhD	0.08	0.07	0.03	0.15
	(0.02)	(0.02)	(0.01)	(0.03)
Migration destination				
Africa	0.08	0.31	0.02	0.15
	(0.03)	(0.03)	(0.01)	(0.03)
France	0.18	0.15	0.10	0.05
	(0.05)	(0.02)	(0.02)	(0.02)
Germany	0.05	0.04	0.01	0.00
	(0.03)	(0.01)	(0.01)	(0.01)
North Am.	0.07	0.06	0.41	0.33
	(0.03)	(0.02)	(0.04)	(0.04)
Other OECD	0.61	0.41	0.11	0.05
	(0.06)	(0.03)	(0.02)	(0.02)
Other	0.01	0.03	0.09	0.04
	(0.01)	(0.01)	(0.02)	(0.01)

Note: Standard errors in parentheses. "Sample" displays the usual average in the population of respondents. "Adj." displays the adjusted average using the methodology proposed in Méango (2014). "Migration destination" for non-migrants is for the region or country of desired migration. "Educational attainment" is observed at the time of response to the survey. "Age at Bac." is the age which the respondent passed the exam Baccalauréat.

Table 2: Parents' characteristics, migrants vs. non-migrants

	Migrants		Non-migrants	
	Sample	Adj.	Sample	Adj.
Mother characteristics				
Absent	0.15	0.09	0.13	0.19
	(0.03)	(0.02)	(0.03)	(0.03)
Lived in foreign country	0.16	0.19	0.10	0.17
	(0.02)	(0.03)	(0.02)	(0.03)
Education level				
Primary	0.32	0.29	0.46	0.48
	(0.03)	(0.03)	(0.04)	(0.04)
Secondary	0.30	0.13	0.32	0.31
	(0.03)	(0.02)	(0.04)	(0.04)
Tertiary - Bachelor and below	0.27	0.51	0.18	0.20
	(0.03)	(0.03)	(0.03)	(0.03)
Tertiary - Master and above	0.11	0.07	0.03	0.02
	(0.02)	(0.02)	(0.01)	(0.01)
Father characteristics				
Absent	0.19	0.12	0.22	0.25
	(0.03)	(0.02)	(0.03)	(0.03)
Lived in foreign country	0.26	0.40	0.14	0.21
	(0.03)	(0.03)	(0.03)	(0.03)
Education level				
Primary	0.29	0.32	0.39	0.31
	(0.03)	(0.03)	(0.04)	(0.04)
Secondary	0.15	0.06	0.19	0.11
	(0.02)	(0.02)	(0.03)	(0.02)
Tertiary - Bachelor and below	0.25	0.13	0.22	0.22
	(0.03)	(0.02)	(0.03)	(0.03)
Tertiary - Master and above	0.31	0.49	0.20	0.36
	(0.03)	(0.03)	(0.03)	(0.04)
Family capital				
Own at least one car	0.56	0.77	0.37	0.46
	(0.03)	(0.03)	(0.04)	(0.04)
Own a house property	0.70	0.84	0.64	0.69
	(0.03)	(0.02)	(0.04)	(0.04)
Own a land property	0.59	0.64	0.50	0.50
	(0.03)	(0.03)	(0.04)	(0.04)

Note: Standard errors in parentheses. "Sample" displays the usual average in the population of respondents. "Adj." displays the adjusted average using the methodology proposed in Méango (2014).

Table 3: Probit regressions of migration decision on student-family-helper characteristics, and helper's participation on respectively student, student-family, student-family-helper characteristics.

Dpdt variable	Migration	Helper's participation		
Student characteristics				
Primogeniture	0.66**	-0.094	-0.186	0.019
	(0.30)	(0.25)	(0.26)	(0.28)
Age at Baccalauréat	0.206***	0.132*	0.143*	0.174**
	(0.08)	(0.07)	(0.08)	(0.08)
Female	-0.58*	0.393*	0.41	0.433
	(0.34)	(0.23)	(0.26)	(0.30)
Bac. grade (ref. Acceptable)				
Very good	0.92**	0.337	0.203	0.255
	(0.42)	(0.35)	(0.38)	(0.39)
Good	1.629**	-0.033	0.044	-0.126
	(0.50)	(0.32)	(0.33)	(0.38)
Special Track	0.747**	-0.155	-0.071	0.046
	(0.34)	(0.33)	(0.33)	(0.37)
Family characteristics				
Absent father	0.285		-0.675	-0.70
	(0.48)		(0.42)	(0.47)
Father's educ.	0.065		-0.005	0.141
	(0.35)		(0.35)	(0.37)
Mother's educ.	-0.69**		-0.076	0.039
	(0.35)		(0.28)	(0.29)
# of children	-0.106*		-0.074	-0.055
	(0.06)		(0.07)	(0.07)
Car ownership (Ref. No car)				
Two cars	1.168**		-0.001	-0.176
	(0.51)		(0.33)	(0.37)
One car	0.141		0.001	-0.18
	(0.37)		(0.28)	(0.29)
Helper characteristics				
Resides in dest. country	0.961***			0.751**
	(0.32)			(0.30)
Education	1.328***			-1.03*
	(0.36)			(0.62)
Car ownership	-0.494			-0.022
	(0.30)			(0.26)
Uncle/aunt	1.089***			-0.061
	(0.40)			(0.32)
Brother/sister	0.112			0.765**
	(0.35)			(0.34)
Female	0.937***			-0.777***
	(0.33)			(0.28)
Observations:	216	130	130	130
Log likelihood:	-40.41	-86.77	-84.53	-73.31

Note: *** significant at 1%, ** significant at 5%, * significant at 10%. Robust standard errors in parentheses. 'Mother's Educ.', 'Father's Educ.' and helper's 'Education' are equal to one respectively if the mother, father or helper obtained some tertiary education. '# of children' is the number of children in the family other than the migrant.

Table 4: Financing tertiary education, migrants v. non-migrants

	Migrants		Non-migrants	
	Sample	Adj.	Sample	Adj.
Paying for education in foreign country				
Self	0.13	0.08	0.24	0.10
	(0.02)	(0.02)	(0.03)	(0.02)
Father and/or mother	0.34	0.34	0.16	0.06
	(0.03)	(0.03)	(0.03)	(0.02)
Helper	0.04	0.02	0.06	0.03
	(0.01)	(0.01)	(0.02)	(0.01)
Scholarship	0.20	0.25	0.31	0.56
	(0.03)	(0.03)	(0.03)	(0.04)
Shared	0.27	0.30	0.20	0.23
	(0.03)	(0.03)	(0.03)	(0.03)
Paying for education in Cameroon				
Self	0.07	0.04	0.09	0.06
	(0.02)	(0.01)	(0.02)	(0.02)
Father and/or mother	0.57	0.77	0.60	0.54
	(0.03)	(0.03)	(0.04)	(0.04)
Helper	0.04	0.01	0.03	0.01
	(0.01)	(0.01)	(0.01)	(0.01)
Scholarship	0.11	0.04	0.22	0.36
	(0.02)	(0.01)	(0.03)	(0.04)
Shared	0.06	0.04	0.03	0.01
	(0.02)	(0.01)	(0.01)	(0.01)

Note: Standard errors in parentheses. "Sample" displays the usual average in the population of respondents. "Adj." displays the adjusted average using the methodology proposed in Méango (2014). Non-migrants reported the expected financing plan in case of migration. "Shared" referred to the coverage of the expenses by at least two of the parties above (self, parent, helper, or scholarship).

Table 5: Helper's characteristics

	Mig. with helper not contributing		Mig. with contributing helper		Non-migrants	
	Sample	Adj.	Sample	Adj.	Sample	Adj.
Declares helper					0.55	0.62
					(0.03)	(0.03)
Helper's characteristics						
Female	0.37	0.13	0.27	0.12	0.31	0.12
	(0.06)	(0.04)	(0.06)	(0.04)	(0.04)	(0.03)
Brother/sister	0.22	0.55	0.41	0.65	0.31	0.60
	(0.05)	(0.06)	(0.06)	(0.06)	(0.04)	(0.04)
Uncle/aunt	0.50	0.19	0.30	0.13	0.40	0.16
	(0.07)	(0.05)	(0.06)	(0.04)	(0.04)	(0.03)
Helper's education						
Primary	0.02	0.01	0.09	0.03	0.06	0.02
	(0.02)	(0.01)	(0.04)	(0.02)	(0.02)	(0.01)
Secondary	0.03	0.01	0.08	0.02	0.06	0.02
	(0.02)	(0.01)	(0.03)	(0.02)	(0.02)	(0.01)
Bachelor and below	0.38	0.20	0.22	0.62	0.30	0.40
	(0.06)	(0.05)	(0.05)	(0.06)	(0.04)	(0.04)
Master and above	0.57	0.78	0.61	0.33	0.59	0.56
	(0.06)	(0.05)	(0.06)	(0.06)	(0.04)	(0.04)
Helper's migration history						
Lives abroad	0.65	0.37	0.47	0.23	0.56	0.30
	(0.06)	(0.06)	(0.06)	(0.05)	(0.04)	(0.04)
Lives in destination	0.40	0.62	0.59	0.86	0.50	0.73
	(0.06)	(0.06)	(0.06)	(0.04)	(0.05)	(0.04)

Note: Standard errors in parentheses. "Sample" displays the usual average in the population of respondents. "Adj." displays the adjusted average using the methodology proposed in Méango (2014). Non-migrants reported the expected helper plan in case of migration.

Table 6: Distribution of sample by assigned type

	130 families of student migrants with helper							
Parents' Educ.	Low				High			
Car	No		Yes		No		Yes	
# Children$\leq$ 3	No	Yes	No	Yes	No	Yes	No	Yes
Type	0	1	2	3	4	5	6	7
(% of sample)	(15.4)	(9.2)	(7.6)	(0.8)	(17.7)	(6.9)	(31.5)	(10.8)

Note: 'Parent's Educ.' is 'low' if none of the parent holds a tertiary education degree, 'high' otherwise. 'Car' is 'No' if none of the parent possess a car', 'Yes' otherwise. '# Children $\leq$ 3' is 'No' if the parents have more than three children, 'Yes' otherwise.

Table 7: Regression of the helper's participation decision on family types and other controls

Dpdt: Helper's participation	(1)	(2)	(3)
Family Type (Ref. type 0)			
1	0.059	0.381	0.217
	(0.94)	(0.88)	(0.93)
2 & 3	1.714	1.683*	1.966*
	(1.18)	(0.99)	(1.06)
4	1.235*	1.491**	1.519**
	(0.75)	(0.7)	(0.74)
5	1.408	1.592^{+}	1.137
	(1.11)	(0.98)	(1.02)
6	0.907	1.122*	1.41**
	(0.73)	(0.64)	(0.71)
7	0.872	1.248^{+}	1.583*
	(0.84)	(0.78)	(0.83)
Controls			
Helper's characteristics	Yes	Yes	Yes
Student's characteristics	Yes	No	No
Other family capital	No	No	Yes
Obs.	130	130	130
Log. lkhd.	-75.46	-78.82	-77.8

Note: *** significant at 1%, ** significant at 5%, * significant at 10%, + significant at 11%. Robust standard errors in parentheses. Helper's and student's characteristics include all the Characteristics in Table 3. The variable 'Other Family capital' includes the ownership of a field property and/or a house. The family type 0 is the reference group (low educated parents, owning no car, and more than 4 children).

Appendix

A. Derivation of the Predictions

I introduce some notations that will be helpful below. Let $R(X) = (1 + r(X))I$ be the gross revenue from the investment, r_h the interest rate for an alternative investment for the helper and r_p the analog interest rate for the parents. Again, the focus is on parents who contemplate borrowing on the formal financial market to finance the migration investment as the alternative to an arrangement with the helper. Another possible option is for parents not to implement the migration investment and invest their capital in the home country at the rate r_1. This choice reflects the data restrictions. In the case where parents invest in student migration without the helper contribution, note that

$$r_p K = r(X)K + (r(X) - r_0)(I - K) \tag{A.1}$$

A.1. Perfect Commitment Bargaining

The solution to the Nash bargaining with perfect commitment can be found by solving the following maximization problem

$$\begin{aligned} \max_{u_h, u_p, Y} \quad & \mu ln(u_h) + (1-\mu) ln(u_p) \\ s.c \quad & u_h + u_p \leq R \\ & u_h \geq (1 + r_h)(I - K) \\ & u_p \geq (1 + r_p)K \\ & Y = 1(R - I > 0) \end{aligned}$$

For $R \leq I$ (student migration generating a positive return), this is equivalent to solving for a sharing rule α, such that:

$$\max_{\alpha} \mu ln\left(\alpha R - (1 + r_h)(I - K)\right) + (1-\mu) ln\left((1-\alpha)R - (1 + r_p)K\right) \tag{A.2}$$

Solving for the first-order condition for α, it follows that the optimal solution, $\tilde{\alpha}$, must satisfy:

$$\frac{\mu R}{\tilde{\alpha} R - (1 + r_h)(I - K)} = \frac{(1-\mu)R}{(1-\tilde{\alpha})R - (1 + r_p)K}$$

After some straightforward algebra, the following optimal sharing rule is obtained:

$$\tilde{\alpha} = \mu + \left[(1-\mu)[(1+r_h)(I-K)] + \mu(1+r_p)K)\right]/R \tag{A.3}$$

Negotiations will break down if the parents' capital is below a threshold $\tilde{K}$ such that there is no $0 \leq \tilde{\alpha} \leq 1$ for which an agreement can be reached. It can be shown that $\tilde{\alpha} \in [0;1]$ if and only if K satisfies:

$$(1-\mu)(1+r_h)(I_K) \geq \mu[(1+r_p)K - R] \tag{A.4}$$

$$(1-\mu)(1+r_h)(I_K) \leq (1-\mu)R + \mu(1+r_p)K \tag{A.5}$$

The first inequality will be trivially satisfied because $r_p K < r(X)I$ by Equation (A.1). The second inequality depends on the size of the helper's outside option. It is sufficient that $r(X) \geq r_h$, even in the extreme case where $K = 0$. If r_h ise close to r_1, the condition is for $r(X) \geq r_1$, which is the participation incentive of the parents themselves. Therefore, it is very unlikely that an agreement is not reached.

If an agreement is reached, the helper can capture part of the benefit that the family makes from financing itself outside the formal financial market. Using Equation (A.1), the profit of participation for the helper is:

$$\Pi_h = \mu(r_0 - r_h)(I-K) \tag{A.6}$$

The predictions follow immediately from taking the appropriate partial derivatives of Π_h.

A.2. Non-Commitment Bargaining

In this environment, investment decisions are the solution of a Pareto problem that contains a set of participation constraints for each party in addition to the standard budget constraints:

$$\begin{aligned}
\max_{u_h,u_p,Y} \quad & \mu ln(u_h) + (1-\mu) ln(u_p) \\
s.c \quad & u_h + u_p \leq R \\
& u_h \geq (1+r_h)(I-K) - C^h && \text{(A.7)} \\
& u_h \geq 0 && \text{(A.8)} \\
& u_p \geq (1+r_p)K && \text{(A.9)} \\
& u_p \geq R - C^p && \text{(A.10)} \\
& Y = 1(R - I \geq 0)
\end{aligned}$$

where C^h is the helper's cost of deciding not to contribute to the migration investment and C^p, the parents' cost of not abiding by the previous agreement. Again, both costs can be interpreted as retaliation costs for not complying with a social norm (for the helper) or the terms of the contract (for the parents).[19] In case $Y = 1$, we can distinguish between three types of regions:[20]

i. a region where Equations (A.7) and (A.10) are binding,
ii. a region where Equations (A.8) and (A.10) are binding, and
iii. a region where Equations (A.8) and (A.9) are binding.

Case i

This case is characterized by $(1 + r_h)(I - K) - C^h < 0$ and $(1 + r_p)K < R - C^p$. Or equivalently: $K < I - \frac{C^h}{1+r_h}$ and $K < I - \frac{C^p}{1+r_0}$. I assume that the retaliation costs are such that:

$$\frac{C^h}{(1 + r_h)} \geq \frac{C^p}{(1 + r_0)} \tag{A.11}$$

This assumption will be true if retaliation costs are somewhat similar, and, as assumed before, $r_0 > r_h$. The case of interest is then characterized by:

$$K < I - \frac{C^h}{1 + r_h}$$

The problem is then equivalent to the following:

$$\max_{\alpha} \ \mu ln[\alpha R - (1 + r_h)(I - K) - C^h)] + (1 - \mu) ln[(1 - \alpha)R - (R - C^p)]$$

Using the FOC leads to

$$\frac{\mu R}{\alpha^* R - (1 + r_h)(I - K) - C^h} = \frac{(1 - \mu)R}{(1 - \alpha^*)R - (R - C^p)} \tag{A.12}$$

After some algebra, we find

$$\alpha^* = \mu + \frac{1}{R}[(1 - \mu)[(1 + r_h)(I - K) - C^h] - \mu(R - C^p)] \tag{A.13}$$

[19] Imperfect commitment induces $C^p < R$.

[20] Under the assumption that $\frac{C^h}{(1+r_h)} \geq \frac{C^p}{(1+r_p)}$ below, it suffices to analyze these three regions.

Note that there is a threshold K^*, which depends on the parameters of the models, such that, below this threshold, no α^* is between 0 and 1, and thus no agreement is feasible. If α^* exists, helper's profit can be written:

$$\Pi_h = \alpha^* R - [(1+r_h)(I-K) - C^h] = (C^p - C^h) + \mu(C^p + C^h) - \mu(1+r_h)(I-K) \quad \text{(A.14)}$$

Note that the helper's profit will increase with K.

Case ii

This case is characterized:

$$I - \frac{C^h}{1+r_h} < K < I - \frac{C^p}{1+r_0} \quad \text{(A.15)}$$

The maximization problem is equivalent to

$$\max_{\alpha} \mu ln(\alpha R) + (1-\mu) ln[(1-\alpha)R - (R - C^p)]$$

The FOC leads to

$$\frac{\mu R}{\alpha R} = \frac{(1-\mu)R}{C^p - \alpha R}$$

It follows easily that

$$\alpha^* = \frac{\mu C^p}{R} \quad \text{(A.16)}$$

From this, the helper's gain can be computed as being equal to:

$$\Pi_h = \alpha^* R = \mu C^p \quad \text{(A.17)}$$

Note that if the bargaining power and the retaliation costs are assumed constant, this profit is constant. However, if C^p, μ are weakly decreasing in K, the helper's profit is also weakly decreasing.

Case iii

Maintaining the assumption from Equation (A.11), the region of interest is characterized by:

$$K > I - \frac{C^p}{1+r_0} \quad \text{(A.18)}$$

The problem is equivalent to :

$$\max_{\alpha} \mu ln(\alpha R) + (1-\mu) ln[(1-\alpha)R - (1+r_p)K]$$

Again, using the FOC, we have for the optimal sharing α^*:

$$\frac{\mu}{\alpha^* R} = \frac{1-\mu}{(1-\alpha^*)R - (1+r_p)K}$$

so that

$$\alpha^* = \mu - \frac{\mu(1+r_p)K}{R} \tag{A.19}$$

The helper's profit can then be written as:

$$\Pi_h = \mu[R - (1+r_p)K] \tag{A.20}$$

From Equation (A.1), it follows that

$$\Pi_p = \alpha^* R = \mu(1+r_0)(I-K) \tag{A.21}$$

Note that the profit is now decreasing in K.

B. Information About the Survey

To reach both populations (migrant and non-migrant), we used a snowball sampling procedure via an online platform. This online platform is accessible at www.migration-cameroun.com. The initial sample consisted of 22 individuals (called "seeds") contacted by the researcher. The seeds were chosen on the basis of geography (country of residence) and demographics (gender, age) to be as representative as possible of the population. Each seed was asked to answer a questionnaire and to invite as many friends as possible from the population of interest. The invitee would receive an electronic mail from his host containing information about the survey and a unique link to access the online questionnaire. If he/she agreed to participate, he/she was required to complete the questionnaire and invite as many friends as possible in the population of interest. Recruitment is said to occur in waves and stops when invitees fail to complete the survey or invite other friends. The wave at which i is invited is the number of recruiters that separates him from the initial sample. Participation in the study was restricted to a prior invitation and each invitee received a unique token that enabled us to retrace the paths of invitation. Participants were compensated by being registered each week in a lottery for four prizes of equal value ($50 CAD). After six weeks, the survey reached 418 respondents (1,710 individuals were invited

to the survey); 12 individuals were excluded from the dataset after we detected severe inconsistencies in their answers. Because of the particularities of the sampling procedure, Horvitz-Thompson estimators are used as unbiased estimators of the true population mean. Details of this adjustments and the estimators are presented in Méango (2014) and the adjusted population estimators.

C. Proof of the Bounds in Equation (4)

Note that :

$$P(Y=1|K) = P(Y=1, D=1|K) + P(Y=1, D=0|K),\ K \text{ a.e.}$$

Here, the quantity $P(Y=1, D=0|K=k)$ is the troublesome term, since it is unobserved. Nonetheless, using Equation (2), we can bound $P(Y=1|K),\ K$ a.e. by:

$$\max_{k>K} Pr(Y=1, D=1|K) \leq Pr(Y=1|K) \leq \min_{k\leq K} Pr(Y=1, D=1|K) + 1 - Pr(D=0|K) \tag{C.1}$$

Equation (C.1) can be derived as Proposition 1 from Manski and Pepper (2000). Note that Equation (2) can be interpreted as their MIV assumption. To test whether Equation (C.1) holds, one could check whether the proposed bounds cross each other. If it is the case, the monotonicity assumption can be rejected. There is little chance that the above bounds cross in our case, for they are inherently wide and would necessitate that $Pr(Y=1, D=1|K)$ increases relatively steeply with K.In fact, there is no crossing in the data. Therefore, I assume knowledge of the selection direction. Equation (4) follows immediately from noting that by Bayes's rule:

$$P(Y=1|K) = P(Y=1|D=1;K)P(D=1|K) + P(Y=1|D=0;K)P(D=0|K)$$

and applying the positive selection and monotonicity assumptions, respectively.

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