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Insurance Motives to Remit

Evidence from a Matched Sample of Ethiopian Internal Migrants

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ABSTRACT

Migration and remittances can be used by rural households as a means of insurance, investment, and income augmentation. Ample attention has been given to studying international remittance flows, since for many countries such transfers comprise a significant fraction of income. Remittance flows from internal migrants are relatively understudied, particularly in Africa, where remittance rates are poor. We use a unique matched migrant sample to study what drives the low remittance rates in Ethiopia. Descriptive statistics suggest remitters are positively selected in terms of wealth characteristics compared with the average tracked migrant. Limited skill transferability and liquidity largely explain low remittance rates in Ethiopia. Weaker evidence suggests migrants are additionally motivated to remit as a form of self-insurance against own shocks to income and investments towards future inheritable assets.

Keywords: migration, remittances, insurance, Ethiopia

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1. INTRODUCTION

One of the primary ways that migrants can help households that they leave is by sending back remittances. Remittances can be used to augment consumption among source household members, implying improved living standards among those left behind. However, remittances are costly to send. From an international perspective, migrant workers typically lack access to inexpensive and reliable modes of transferring income across borders (Ashraf et al. 2010). Transfers from internal migrant workers may also be infrequent if migrants are credit constrained at the destination, or alternatively if the financial system is underdeveloped between the migrant destination and origin.

Theoretically, there are several potential motives underlying the decision to remit, including altruism, implicit insurance contracts between migrants and households they left, and potential bequests (Yang 2011). Altruism exists between the migrant and individuals at the origin, yet the existence and timing of remittances can often be explained through long-term implicit insurance contracts between migrants and households (Hoddinott 1994). The promise of bequests is often cited as a further motivation for migrant remittances (Melkonyan and Grigorian 2010). One challenge in identifying these motives is that data are not typically available directly either from the sender or the recipient of remittances. As a result, researchers are normally left making inferences about or eliciting perceptions of conditions for the other in attempting to understand the rationale for remittances.

While international remittances have become a hot topic in recent years (see, for example, Osili 2007; Freund and Spatafora 2008; Yang 2008; Bollard, McKenzie, and Morten 2010), recent studies of internal remittances are relatively scarce in the literature. That said, internal migration is more likely to affect low-income households than international migration (de Brauw and Carletto 2008), making the study of internal migration pertinent to national poverty reduction strategies. A major exception is studies done on China, where remittances have grown dramatically due to increases in internal migration (Rozelle, Taylor, and de Brauw 1999; Du, Park, and Wang 2005). One potential reason for the emphasis on international remittances is that they often flow through formal channels and therefore are relatively easy to document. Although informal flows between countries exist as well, often through couriers and *hawalas*,¹ it is relatively easy to trace formal sources of remittances through the financial system, making research on both micro- and macro-flows possible.

Furthermore, international migrants frequently remit to their households, making economic impacts on source households more clear. Previous work illustrates that the proportion of households receiving remittances exceeds 80 percent in quite different contexts, such as Mexico (Taylor and Wyatt 1996) and the Kayes area of Mali, Mauritania, and Senegal (Azam and Gubert 2006). Internal remittance rates, at least among self-reports, appear somewhat lower (Table 1.1). Quisumbing and McNiven (2010) find that 68.4 percent of migrants in their sample in Bukidnon province, Philippines, remit to their parent households. In El Salvador and China, we find that around two-thirds of internal migrants remit. But in African countries, internal remittance rates are much lower. Azam and Gubert (2006) predict a remittance rate of 26 percent in the Kayes area of western Mali, controlling for the migrant's residence. Evidence from the 1993 Living Standards Measurement Study collected in South Africa also corroborates the low remittance rates in Africa (29.7 percent), noting the results may be sensitive to the period of history in South Africa.

In this paper, we use a matched sample of households and internal migrants to study the determinants of remittance behavior in Ethiopia. As Ethiopia's population is largely rural and the climate notable for frequent negative shocks, sending labor to distant markets can potentially offer rural households a method of income diversification through remittances. However, labor migration rates are quite low in Ethiopia. In the sample we use, only 15 percent of households had at least one household

¹ Jones (2005) provides detailed descriptions of both systems. The courier system transfers the money by commissioning an individual to physically deliver the money from the host country to the recipient country. The *hawala* system delivers funds by commissioning a *hawaladar* in the host country to receive the funds from a migrant and then transfer the funds to the recipient in the local currency by way of another person stationed in the recipient's country.

member migrate internally in the previous five years. As with the studies above, we find that relatively few internal migrants that we tracked had sent remittances to the source household in the previous 12 months. Only 33 percent of tracked migrants report remitting anything to the source household, and these reports are largely confirmed by the broader household survey.

Table 1.1—Internal remittance rates among migrants, various countries

Country	Internal remittance rate	Source
China	66.4	China National Rural Survey, 2000
El Salvador	66.3	<i>Red Solidaria</i> Evaluation Survey, 2008
Bukidnon, Philippines	68.5	Quisumbing and McNiven 2010
South Africa	29.7	South Africa Living Standards Measurement Study, 1993
Kayes area (Mali), Mauritania, and Senegal	26.0	Azam and Gubert 2006

Source: Compiled by authors.

Similar to the sample in Quisumbing and McNiven (2010), the matched sample offers additional information on the attributes of the migrant, the source household, and the destination when analyzing remittance determinants. This sample allows for the control of potentially omitted variables that would exist if we had information only from either a migrant-level survey or a household-level survey. From the perspective of a migrant survey, we have additional information about source household characteristics and the shocks households faced during the recall period. If one uses a household survey, one cannot measure variables that might affect the remittance decision from the migrant’s perspective, such as shocks faced by the migrant. Understanding factors determining remittance levels from both sides could be particularly important in explaining why remittance rates are relatively low in Ethiopia.

Our primary objective is to understand what factors shape the motivation to remit among internal migrants in Ethiopia who have left the source household primarily for employment. Our findings suggest first that many internal migrants remain constrained in two forms: lack of transferability in skills, and liquidity. We also detect weaker evidence for the enforcement of implicit contracts through the promise of bequests and self-insurance against own shocks. The next section provides a more complete description of the datasets used in the analysis, the Ethiopian Rural Household Survey and the migrant tracking survey, along with descriptive statistics about identified migrants. In Section 3, we present a conceptual framework and review pertinent literature. In Section 4, we describe our empirical model and results, and the fifth section concludes.

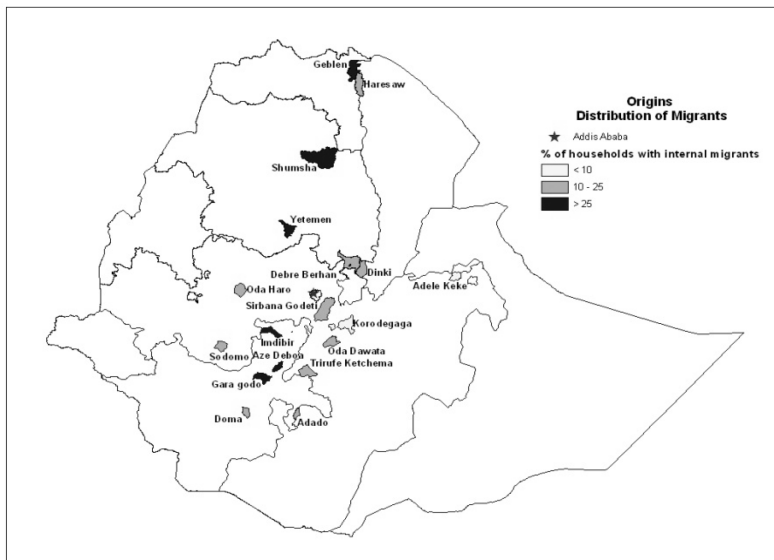
2. DATA

The dataset we use for analysis in this paper matches data from a panel survey, the Ethiopian Rural Household Survey (ERHS), with data from a migrant tracking survey conducted among migrants from the ERHS households in late 2009. The migrant tracking survey was specifically designed to track the type of migrants more likely to be employed and who therefore would be more likely to remit. In this section, we describe how we constructed the sample of matching households and migrants used in this paper.

Ethiopian Rural Household Survey

The Ethiopian Rural Household Survey (ERHS) is a unique, longitudinal household dataset collected by Addis Ababa University, the University of Oxford, and the International Food Policy Research Institute. It follows households from fifteen villages from 1994 to 2009; three additional villages were added to the 2004 round (and were surveyed in 2005); the 2009 round then included all eighteen villages. The villages were initially chosen to account for the diversity of farming systems in Ethiopia. The survey includes modules, among others, on household characteristics, agriculture and livestock, food consumption, health, and women's activities. The most recent two rounds, used in this study, also included modules on self-reported shocks. The ERHS has been used for a large number of papers studying various aspects of risk and poverty dynamics in Ethiopia (for example, Dercon, Hoddinott, and Woldehanna 2007; Fafchamps, Kebede, and Quisumbing 2009; Kadiyala et al. 2009). For the purpose of this study, we focus on the latest two rounds of the panel, which occurred in 2004/05 and 2009. We use data from the expanded 18 villages for our analysis, which are depicted in Figure 2.1.

Figure 2.1—Locations of and migration prevalence from ERHS villages



Source: Migrant tracking survey, Ethiopia, 2009.

Migrant Tracking Survey

Approximately three months after the completion of the primary ERHS survey in 2009, all 18 ERHS villages were revisited to conduct a short migrant tracking survey. Enumerators were given household rosters based on the 2004/05 survey and were asked to identify the location of all household members that were enumerated in that round. After locating the household, the enumerator would ask the household head to identify individuals who no longer lived in the household. If the household head was not found

but the household was identified in the village, the census was administered to another household member who was deemed most knowledgeable about the household's members. In cases in which whole households had moved out of the village, enumerators asked village leaders about the present whereabouts of each household member and the reason for leaving. We were able to identify 1,595 households out of 1,606 households originally sampled in 2004/05.

The focus of the study was to understand more about migration and remittance behavior in Ethiopia. Because of the intent of the study, we asked the tracking survey respondent several detailed questions to further restrict our sample of migrants to those who likely migrated for the purpose of employment rather than, for example, marriage. We initially asked households to list all household members aged 10 years and above who had moved out of the ERHS village to another peasant association (PA) for at least three months. To further filter our sample, household heads were asked to specify the reason each migrant left the household. Based on these responses, we restricted the sample for tracking to individuals who moved due to the loss of land, for employment, or for schooling and who stayed in their destinations for employment, to follow another family member, or for a resettlement program. Finally, we instructed enumeration teams only to follow family members of the household head, since relatives are more likely to send remittances.² When the entire household had moved out of the village, we followed entire households that community leaders reported had left primarily for economic reasons.

Based on our tracking protocol, we found that 406 migrants were eligible to be tracked. Of those 406 migrants, we successfully tracked 313 from 244 source households, a tracking success rate of 77 percent.³ Of those 244 households, 22 were full households, where all members of the household had migrated out of the ERHS village to another destination.

Permanent Out-Migration in the ERHS Villages

Not surprisingly, we find substantial variation in migration rates from ERHS villages (Figure 2.1). Only a small portion of the migrants in our sample move to Addis Ababa (Table 2.1, Panel A); in fact, the most common type of migration is to other rural areas. Defining urban areas as *woredas* (districts) with a town of 50,000 or more inhabitants, we find that 64 percent of migrants in our sample move to rural areas, with the remainder of migration being rural–urban migration. These figures are consistent with evidence found in the 2004/05 *National Labour Force Survey* (CSA 2006), where 40 percent of migrants in Ethiopia move between rural areas and 26 percent move from rural to urban areas. Other migrants in the *National Labour Force Survey* primarily move from urban areas to other urban areas.

The predominant reason for moving among our sample of migrants is to seek employment (Table 2.1, Panel B), consistent with the tracking protocols. A few also report moving for schooling, resettlement, to follow their family, or due to a loss of land. Noting that a portion of these migrants were associated with whole households, these figures demonstrate that households and migrants themselves suggested similar motivations for migration.

² Furthermore, in pilot testing the questionnaire, we found that households had a difficult time helping us with finding non-family members, as they paid less attention to their whereabouts after leaving the household.

³ Because we knew that we would not find some migrants, we randomly allocated households to two different tracking strategies to attempt to identify any sources of attrition bias; unfortunately, the two strategies were equally successful. Nevertheless, there are few statistical differences between households with and without tracked migrants. Tracked migrant households have more adult sons, have a lower propensity to be Muslim, had fewer months in the last year that they were unable to satisfy food needs in the household, and are older. However, the first three differences are only statistically significant at the 10 percent significance level (see Appendix Table A.1). Note that some households had more than one migrant, accounting for the difference in sample size in the appendix.

Table 2.1—Migration characteristics by individual, 2009

	Number of obs.
Panel A: Destination (by Region)	
Addis Ababa	60
Oromia	89
Amhara	59
Tigray	35
SNNP	47
Other	23
Panel B: Reason for Leaving	
Employment	244
Schooling	15
Resettled/followed family	29
Loss of land	13
Other	12

Source: Migrant tracking survey, Ethiopia, 2009.

Furthermore, migrants maintain a great deal of contact with the source household (Table 2.2). A large portion of migrants remain in contact with people in the ERHS villages; for example, 82 and 66 percent of migrants report regular contact with the household they left and friends in the source village, respectively, during the past year. Furthermore, 56 percent returned to the village frequently in the past year. The level of contact can be contrasted with the low intent to return, where only 31 percent intend to live in the village again, indicating that return migration is likely to be low.

Table 2.2—Contact with ERHS household and village, 2009

Question	Percentage reporting “yes”
Reports regular contact with source household in the past year	82.1
Reports contact with friends in source village in the past year	65.8
Returned to village frequently during the past year	55.9
Intends to return to village again to live there	31.0

Source: Migrant tracking survey, Ethiopia, 2009.

3. MOTIVES TO REMIT AND HOUSEHOLD COOPERATIVE STRATEGIES

Harris and Todaro (1970) were the first to formalize the individual's decision to move out of a rural area to an urban one based on maximizing his expected income. A primary weakness of the traditional Harris-Todaro framework for studying migration is that there is no obvious reason for migrants to remit back to their families. Yet remittances occur everywhere and occur frequently, even if only some migrants remit, as in Ethiopia. Several studies investigate the motivation of migrants to remit assuming a strategic framework, where the household decides to send a migrant for the purpose of earning remittances and the migrant in exchange decides to remit for future unemployment insurance or promise of bequests (Yang 2011).⁴ Before reviewing studies relevant to this one in more detail, we provide a brief conceptual framework describing potential motivations to remit from both the migrant and source household perspectives.

Conceptual Framework

We hypothesize a cooperative strategic framework, in which the migrant and those left behind are both at least partially concerned about the welfare of the other (Becker 1974). Within this framework, motivations to remit can broadly be considered rationales that come from either the migrant or household perspective. An additional underlying reason for remitting stems from the preferences of the migrant alone, such as his altruism. With most available datasets, few are able to disentangle the presence of contractual arrangements between household members and migrants in motivating remittance behavior *from* a migrant's altruism (Cox, Eser, and Jimenez 1998; Foster and Rosenzweig 2001). Due to our focus on remittance motives, we briefly discuss the rationales for households and migrants to engage in migration for the purpose of receiving remittances below. We later discuss the challenges in identifying the rationales in a regression framework.

From the household perspective, an initial implicit contract may evolve from migration costs. The household pays an up-front cost to send out a migrant, in forgone on-farm labor productivity and moving expenses, to send out the migrant who reaps higher expected returns to human capital at the destination (Poirine 1997; Ilahi and Jafarey 1999). Returns to human capital are often much greater at migrant destinations than they are at the origin (Clemens 2010). Remittances, then, are sent to the source household as a method of repaying the initial investment. From a data collection perspective, it would be helpful to know the occupation of the migrant prior to leaving. We can proxy for the wage differential between the source and the destination if the migrant had been a wage earner. Moreover, a migrant's prior occupation can reflect his initial skill endowment. Some skills are more transferable in destinations than others. Higher wage differentials and probabilities of employment are potentially linked to higher remittance rates and levels.

An alternative explanation for households to spatially allocate household members is to substitute for formal insurance. Particularly in rural areas, risks to on-farm and off-farm activities are highly correlated (Binswanger and Rosenzweig 1986). As a result, sending a migrant to a distant labor market diffuses the risk faced by the household in its local activities and acts as a substitute for insurance. Such implicit insurance contracts are likely to be imperfect, either due to problems with asymmetric information or enforcement (Foster and Rosenzweig 2001). The insurance motive suggests that if a shock occurs at the migrant source one might observe higher remittance probabilities or levels. To measure vulnerability to shocks, it is important to either collect self-reported information about shocks faced by households or information about shocks from external sources. In our study, we focus on shocks that occurred over the past 12 months since our remittance data are over the same period.⁵

⁴ For a more detailed treatment of the potential motivations behind remittance behavior, see Docquier and Rapoport (2006).

⁵ In only the extreme cases of idiosyncratic ex post risk may we expect migration to be used as an insurance motive, since many informal mechanisms are already in place to reduce these risks in Ethiopia, for example, credit associations and burial societies (Dercon et al. 2008). We instead expect to observe the use of migration to manage covariate ex post risk, such as that associated with droughts and famine.

We have discussed why the household may decide to send household members to participate in the migrant labor force. There are two main reasons why migrants would honor the arrangement by sending remittances back to the source household (Lucas and Stark 1985; Hoddinott 1994; Yang 2011). Migrants might also be inclined to self-insure. By sending money regularly to the source household, migrants might either receive transfers back from the household if shocks occur at the destination, or after a particularly severe shock the migrant would be welcome upon return. Alternatively, migrants might be motivated by potential bequests. If migrants continually send back remittances to households, then they strengthen their claim on future bequests (Melkonyan and Grigorian 2010). As discussed by Lucas and Stark (1985), these two motivations are difficult to distinguish empirically. The bequest motive can be considered through the measurement of household assets; however, it may be unlikely in this context due to relatively low asset levels among households in the ERHS villages. We can, however, adequately control for the self-insurance motive on behalf of the migrant by including measures of own shocks.

The dataset we use in this study has thus has two particular advantages. By design, we can measure the premigration occupation of migrants *and* (self-reported) shocks among both migrants and source households. If motivations to remit are only studied from the migrant or the household perspective, important information can be missed (see, for example, Rosenzweig 2003). In what follows, we review the few studies that have used matched samples to explain remittance behavior, noting most focus on international migrants.

Relevant Literature

Past studies examine the strategic determinants of remittances, excluding information on behalf of the migrant (Lucas and Stark 1985; Hoddinott 1994). The recent body of literature builds upon the aforementioned work by integrating migrant information to corroborate the presence of implicit contracts between the migrant and household and weigh the importance of the underlying motives empirically.

De la Briere et al. (2002) evaluate the contribution of the insurance and inheritance motives to remittance behavior by introducing information from a survey that tracks Dominican Republic migrants who reside in the United States and Dominican Republic cities. They capture the migrant's strategy to invest toward his future inheritance by controlling for the number of heirs in the source household. The number of heirs, they argue, can have positive or negative effects on remittances. From an individual migrant's perspective, an increase in the number of heirs can reduce the return on the investment in a bequest represented by remittances. On the other hand, it can also encourage remittances through increased competition for the inheritance. Among migrants from the Dominican Republic, the authors find strong support for the inheritance motive and weak support for an insurance motive for remittances. Once they account for the migrant's gender and destination, they find robust support for the insurance motive among those without migrant siblings and investment motives among all international migrants.

Amuedo-Dorantes and Pozo (2006) offer an alternative approach to testing altruistic motives to remit separately from insurance motives to remit, by demonstrating correlations between measures of risk in the host economy (the United States) with remittances sent by Mexican immigrants. They argue that remittances sent for altruistic purposes should not be affected by increasing risks in a host country, so they conclude that they are primarily measuring the insurance motive. Migrant's family size is used as a proxy for altruism in the remittance regression. They also distinguish between self-insurance and family-provided insurance by focusing on the end use of remittances. They classify transfers used for the family's consumption as motivated by either interest to insure one's family or altruism, and transfers used to accumulate assets as motivated by one's interest to self-insure. They find that migrants who face higher risks in the host country tend to remit more, in support of the insurance motive. By focusing on the end use of remittances, they are able to distinguish the profiles of immigrants who remit to self-insure versus those who remit to provide their family insurance against risk at home. Migrant's age, education, type of employment, and legal status differentiate the importance of these motives.

Focusing on Nigerian immigrants in the United States, Osili (2007) estimates the relationship between migrant and family determinants of migrants' savings in the host country, origin country, and

total transfers. Low-income households receive more transfers, which are attributed to altruistic motives to remit. Osili also finds investment motives present, as savings in the origin country are positively correlated with family wealth. Finally, she finds that skilled migrants donate more but invest less in the place of origin for themselves. Such evidence refutes a precautionary motive story since skilled migrants are less dependent on origin savings, as their future incomes are greater.

Describing Remitters in Ethiopia

One common theme throughout the aforementioned studies is that demographic differences between migrant households that receive remittances and those that do not can be important.⁶ However, we find few demographic differences between households that receive and those that do not receive remittances. Households that receive remittances tend to have more adult daughters (Table 3.1), which could be indicative of an insurance motive, but we do not find other significant differences in household demographics or composition by remittances received (Table 3.1). Similarly, there are no obvious differences in household wealth by remittance status (Table 3.2).

Table 3.1—Demographic characteristics of migrant households, by whether or not remittances received from migrant, 2009

	No remittances received	Remittances received	T-statistic, difference in means
Demographics			
Sons of head	2.06 (0.12)	2.07 (0.18)	-0.04
Daughters of head	1.53 (0.12)	1.90 (0.19)	-1.76
Adult sons of head	0.91 (0.08)	1.10 (0.14)	-1.16
Adult daughters of head	0.41 (0.07)	0.77 (0.11)	-3.16**
Characteristics of Household Head			
Age of household head	53.12 (1.16)	54.65 (1.41)	-0.83
Head is literate	0.299	0.308	-0.16
Head's primary job is agriculture	0.734	0.800	-1.03
Number of observations	81	140	

Source: Ethiopian Rural Household Survey, 2009.

Notes: Standard errors and t-statistics are calculated accounting for clustering at the neighborhood level. ** indicates significant difference at the 5 percent level.

⁶ We define receiving households as any households that report receiving remittances in the 12 months prior to the ERHS survey.

Table 3.2—Migrant household wealth and exposure to shocks, by whether or not remittances received from migrant, 2009

	No remittances received	Remittances received	t-statistic, difference in means
Wealth Measures			
Number of oxen owned	0.93 (0.10)	1.20 (0.20)	-1.43
Tropical livestock units (TLUs)	3.57 (0.40)	4.31 (0.55)	-1.26
Land (hectares)	1.55 (0.17)	1.61 (0.25)	-0.21
Shocks			
Reported drought in past 12 months	0.326	0.375	-0.69
Reported pest infestation in past 12 months	0.159	0.075	1.99**
Reported food price shock in past 12 months	0.435	0.500	-0.88
Reported death in past five years	0.214	0.148	1.22
Reported major illness in past five years	0.229	0.272	-0.67
Number of observations	81	140	

Source: Ethiopian Rural Household Survey, 2009.

Notes: Standard errors and t-statistics are calculated accounting for clustering at the neighborhood level. ** indicates significant difference at the 5 percent level.

Although we do not find many differences at the household level, it could be that individuals who remit are systematically different than those who do not (Table 3.3). We find that fewer remitters than nonremitters are the sole tracked migrant from specific households. This difference corroborates the bequest motive if, for example, the inherent competition for inheritable assets increases the probability of remitting. The variable may alternatively reflect the heavier reliance of the source household on off-farm income. While the majority of migrants left the household for employment, reinforcing the design of the sampling strategy, a greater percentage of the remitters than nonremitters reports having left for employment, and a lower percentage of remitters than nonremitters reports leaving the household to follow a family member.

In the migrant tracking survey, we find that individuals who remit appear to be positively selected on observable characteristics (Table 3.3). For example, we find that a greater percentage of remitters report having completed the fifth grade than nonremitters. Given higher education levels, it is not surprising that remitters are more likely to be employed in skilled occupations. Remitters also tend to have fewer children, which implies that they may be better able to accumulate savings. We find that remitters are also less likely to have been farmers in the 2004/05 survey, which could proxy for the relative youth of remitters relative to others, as the omitted category are students and those who did not appear to work at all. Taken as a whole, these observed characteristics both imply that remitters are not randomly selected among migrants; they appear to be somewhat positively selected on attributes that should be correlated with wealth.

Despite the advantages in human capital at the individual level, other characteristics suggest additional motivations for remittances. We find that all three measures of shocks at the individual level differ by remitting status. A larger percentage of remitters report having had a family member fall seriously ill or pass away. Furthermore, we find that individuals who report having faced increases in food prices during the previous 12 months were more likely to remit. All three of these statistics are consistent with a self-insurance motive for remittances; therefore, we return to this hypothesis in a regression framework.

Table 3.3—Migrant characteristics, by whether or not sent remittances in past 12 months, 2009

	No remittances	Remittances	T-statistic, difference in means
Migrant Characteristics			
Male	0.646	0.565	1.20
Married	0.305	0.250	0.96
Aged 19 to 25	0.524	0.500	0.46
Aged 26 to 40	0.335	0.395	-1.33
Aged over 40	0.037	0.016	1.15
Completed 5th grade	0.634	0.766	-1.98**
Skilled laborer	0.189	0.427	-3.32**
Sole migrant in household	0.707	0.387	4.39**
Son of household head	0.540	0.444	1.40
Daughter of household head	0.233	0.347	-1.80
Years ago Migrant Moved	2.403 (0.152)	2.280 (0.132)	0.67
Destination Household Characteristics			
Number of children present	0.841 (0.127)	0.540 (0.103)	2.14**
Urban destination	0.317	0.435	-1.38
Shocks at Destination			
Ill in previous year	0.049	0.161	-2.68**
Death in household, previous year	0.055	0.145	-2.33**
Reported food price increase	0.268	0.452	-3.12**
Occupation Prior to Leaving			
Skilled laborer	0.037	0.032	0.18
Farmer	0.213	0.113	2.13**
Unskilled laborer	0.049	0.121	-1.78

Sources: All variables come from the 2009 migrant tracking survey except for the occupation prior to leaving, which is from the 2004/05 Ethiopian Rural Household Survey.

Note: Standard errors and t-statistics account for clustering at the neighborhood level. ** indicates significant difference at the 5 percent level.

Challenges in Identifying Motives to Remit

We base our regression analysis on the matched sample of migrants and source households. The advantage of using the matched sample is that we can test for the various hypotheses in a single regression, since we have information on the characteristics and vulnerability of both the source and host households. Because we are interested in understanding the motivations for remittances, we ignore selection into migration here; suffice it to say that households already decide to send out migrants.⁷ The remittance decision, however, involves a second type of selection—as we note, specific individuals appear more likely to remit than others. As a result, as we estimate regressions that explain either the decision about whether or not to remit or the level of remittances, we must be concerned about the potential presence of unobserved differences in household and individual characteristics that affect remittance behavior. It could be that some unobservable attribute of either migrants or source households is correlated with measures that suggest a specific hypothesis explains remittance behavior in Ethiopia, rendering the coefficient estimate on that variable biased. Before discussing how we deal with the potential endogeneity problem, it is worth noting that we can better control for unobservables than some studies due to the nature of our dataset. We can measure shocks to both the migrant at the destination as

⁷ Gray and Mueller (forthcoming) use the recent three rounds of the ERHS to estimate a multinomial model to determine the significance of drought risk on the individual decision to migrate for employment and marriage reasons, differentiating by gender. The sign and significance of the parameters on the household demographic characteristics included in the model do not suggest an obvious direction for selection, meaning there is evidence for both positive and negative selection.

well as to the household, and we can at least crudely measure the occupation of the migrant prior to leaving the village.

Based on the descriptive statistics, we are potentially most interested in hypotheses related to risk coping. In our primary regressions, we use self-reports of shocks that migrants and households have faced. Because the variables are self-reported, one might be concerned that differing unobservable perceptions of vulnerability might be correlated with remittance decisions. There are two ways we can address this problem. The first way is based within the data we have available. For measures of shocks at the household level, we can average over the village, redefining the variable as the proportion of households in each village reporting the shock. For the variable specifically measuring food prices among migrants, we can replace the self-report with measures of food price increases at the *woreda* level computed from data from Ethiopia's Central Statistical Agency, interacted with a measure of each migrant's exposure to food markets. Both strategies help remove the specific problem of potential differences in perceptions of vulnerability.

4. MODEL AND RESULTS

Based on the conceptual framework discussed, we examine the motivations to remit and remittance levels in a multivariate framework. In the empirical work, we highlight differences between results that would have resulted from the use of either cross-sectional data at the household or the migrant level, rather than matched data. Basing regressions primarily on individual migrants, we estimate whether or not migrants remit using the following model:

$$R_{i,2009} = \alpha_0 + X_{i,2009} \alpha_X + H_{h,2009} \alpha_H + S_{i,2009} \alpha_{IS} + S_{h,2008} \alpha_{HS} + l_o + l_d + t_m + \varepsilon_{i,2009}. \quad (1)$$

We initially specify R as an indicator variable for whether or not individual migrant i remits to the household, and estimate equation (1) using the probit model.

On the right-hand side, we use sets of explanatory variables that come from the migrant tracking survey as well as from the ERHS. At the migrant destination, the explanatory variables X include individual characteristics—a gender indicator, an indicator for between 19 and 25 years of age, an indicator for the completion of fifth grade, and a skilled labor indicator—and some characteristics of the destination household, including the number of children present and whether or not it is an urban location. These variables primarily capture differing returns to the migrant’s specific human capital.

We next include a vector of household characteristics, H , from the ERHS data. It includes the number of adult daughters and sons of the household head to measure human capital; landholdings, measured in hectares per capita; tropical livestock units (TLUs) per capita; and an indicator variable for whether or not the migrant is the only one from the household. We then include a vector of self-reported shocks among migrants (S_i) and among the source household members (S_h). Among migrants, we include indicators for whether the migrant reported an illness in the family, whether the migrant reported a death in the family, and whether the migrant reported a rise in food prices. Among households, we measure whether or not households experienced a drought or a pest shock over the previous 12 months. As a robustness check, we test replacing these variables with the share of households within a neighborhood reporting each of these shocks.

Finally, we account for various unobserved characteristics at the origin and destination levels by including dummy variables for the origin, l_o , and destination, l_d , in the regression. We also control for both the influence of competing shocks on remittance patterns and potential remittance decay by including year-of-move dummy variables t_m . We cluster the standard errors at the origin’s neighborhood level to account for any within-neighborhood correlation of outcomes.

Results

We initially estimate equation (1) using the indicator variable to measure remittances (Table 4.1). In the first column, we only include migrant characteristics and shocks at the destination. We find three variables that have a statistically significant relationship with the remittance decision. First, migrants who have skilled employment are more likely to remit. Second, we find that migrants with more children present at the destination are less likely to remit. These two coefficients combine to suggest that liquidity constraints among migrants likely affect the remittance decision. Migrants with skilled positions likely have higher incomes, whereas those with children at the destination have higher necessary expenditures and therefore less liquidity. Finally, we find that migrants who experienced a food price increase are also more likely to remit. This coefficient may imply that migrants remit for at least partial self-insurance.

In column (2), we re-estimate the remittance decision model using only source household characteristics and shocks to the source household. In contrast with the results for migrants alone, we find several variables that have significant correlations with the receipt of remittances. Two demographic variables are correlated with the receipt of remittances; migrants who are the sons of household heads are less likely to remit than other relatives, whereas households with heads who have more daughters have a higher probability of receiving remittances. Older household heads are also more likely to receive

remittances. Suggestive of a bequest motive, one of the two wealth variables, livestock holdings measured in TLUs, is positively correlated with the receipt of remittances. And finally, if the migrant was a farmer prior to leaving the household (measured in the 2004/05 ERHS round), the individual is less likely to have sent remittances.⁸ Perhaps surprisingly, we find no evidence of correlation between the two measures of shocks at the household level and the receipt of remittances.⁹

In column (3), we combine the measures from the migrant tracking survey with measures from the ERHS survey. Many results are similar to those found in columns (1) and (2), indicating that in many cases observing either the migrant or the household in isolation of the other might be sufficient. However, we do find three ways in which the combination of surveys leads to different results than we found when using either one survey or the other. First, the estimated coefficient on the farmer indicator variable declines and is no longer marginally significant. Including measures that describe the present conditions for the migrant appears to lessen the need for controlling for premigration characteristics, at least from the perspective of remittance behavior. Second, we find that the absolute value of the magnitude of the estimated coefficient on the indicator for whether or not the migrant is a son of the household head increases substantially, from -0.516 to -0.826. Finally, the marginal significance (at the 10 percent level) of the destination indicators in columns (1) and (2) is no longer found, suggesting that remittance behavior does not depend upon the destination, once other variables are adequately controlled for. We still find that the origin variables and the year the migrant moved remain statistically significant at the 5 percent level. To make the final specification more parsimonious, in column (4) we remove individual characteristics of migrants and the source household shock variables, and other results are qualitatively similar.

Table 4.1—Motivations to remit, 2009

	(1)	(2)	(3)	(4)
Migrant Characteristics				
Migrant is male	-0.348 (0.247)		0.094 (0.415)	0.070 (0.405)
Migrant is married	0.064 (0.238)		0.11 (0.234)	
Migrant aged 19 to 25	-0.233 (0.177)		-0.233 (0.196)	
Migrant has completed 5th grade	0.091 (0.266)		0.003 (0.245)	
Migrant skilled	0.515 (0.192)**		0.536 (0.234)**	0.555 (0.230)**
Destination Characteristics				
Number of children at destination	-0.385 (0.129)**		-0.443 (0.145)**	-0.384 (0.127)**
Destination is urban	-0.062 (0.273)		0.085 (0.299)	0.084 (0.283)
Shocks at Destination				
Migrant was ill, past 12 months	0.374 (0.317)		0.095 (0.337)	0.114 (0.338)
Migrant experienced death in hh	0.216 (0.247)		0.249 (0.276)	0.245 (0.281)
Food price increase, migrant	0.450 (0.187)**		0.434 (0.199)	0.432 (0.188)

⁸ Other indicators for occupations measured in the 2004/05 survey were not significantly related to remittances and are therefore omitted to keep the specification as parsimonious as possible.

⁹ Although we do not report results here, econometric results do not differ when we use village-level average shocks in lieu of self-reports at the household level.

Table 4.1—Continued

	(1)	(2)	(3)	(4)
Source Household Characteristics				
Farmer prior to leaving		-0.534 (0.281)	-0.384 (0.339)	-0.391 (0.324)
Sole migrant		-0.302 (0.192)	-0.234 (0.204)	-0.275 (0.204)
Migrant is son of head		-0.516 (0.235)**	-0.826 (0.288)**	-0.828 (0.291)**
Migrant is daughter of head		-0.201 (0.241)	-0.202 (0.305)	-0.269 (0.319)
Adult sons		-0.122 (0.090)	-0.155 (0.090)	-0.145 (0.095)
Adult daughters		0.350 (0.124)**	0.271 (0.131)**	0.291 (0.135)**
Source Household Wealth				
Tropical livestock units (TLUs) per capita		0.123 (0.040)**	0.134 (0.045)**	0.126 (0.044)**
Land per capita		-0.199 (0.112)	-0.226 (0.137)	-0.197 (0.138)
Age, household head		0.158 (0.069)**	0.189 (0.072)**	0.191 (0.070)**
Head is literate		-0.256 (0.177)	-0.307 (0.193)	-0.312 (0.185)
Source Household Shocks				
Drought reported, household		-0.309 (0.270)	-0.270 (0.289)	
Pest infestation, household		-0.174 (0.320)	-0.079 (0.312)	
Chi-square, destination dummies	10.96	12.29	4.70	5.04
p-value	0.090	0.056	0.583	0.539
Chi-square, origin dummies	10.15	14.63	12.81	13.99
p-value	0.017	0.002	0.005	0.003
Chi-square, year of moving dummies		15.90	11.74	12.01
p-value		0.007	0.039	0.035
Number of obs.	270	267	267	267

Sources: Migrant tracking survey, 2009, and Ethiopian Rural Household Survey, 2004/05.

Notes: Estimation is by the probit method. Standard errors clustered at the neighborhood level in parentheses. ** indicates significance at the 5 percent level. Destinations include Tigray, Afar, Amhara, Oromia, SNNP, and Addis Ababa. Origins include Tigray, Amhara, Oromia, and SNNP. Statistics reported for sets of dummy variables are for the joint hypothesis test that all coefficients on the dummy variables are equal to zero.

Conditional on remitting, what factors determine remittance amounts is also of importance. We re-estimate the model in equation (1) using the logarithm of remittances as the dependent variable. Since not all migrants remit, we use a Heckman (1979) procedure to account for selection bias by first estimating the inverse Mills ratio and then including it as a regressor in the regression explaining remittance levels.¹⁰ To use a Heckman procedure, we need to find variables that predict remittance behavior but do not affect the level of remittances.

¹⁰ A clear criticism of the Heckman procedure is its reliance on distributional assumptions for calculating the inverse Mills ratio. An option is to estimate it nonparametrically (Das, Newey, and Vella 2003); however, we do not have enough data to support nonparametric estimation of this parameter.

To search for such variables, we initially estimate equation (1) using the logarithm of remittances as the dependent variable and ordinary least squares (OLS), including all explanatory variables used in column (4) of Table 4.1 (Table 4.2). We then compare the results with results from the probit regressions. We find that the number of children at the destination, which affected the probability of remittances, is not correlated with the amount of remittances. Further, the origin indicators were strongly correlated with the probability of remittance receipt but not with the amount of remittances. Therefore, we remove these variables from the model and re-estimate the OLS model in column (2), and find reasonably similar results. Therefore, we use the omitted variables in the first but not the second stage of the Heckman procedure.

Table 4.2—Regressions explaining logarithm of remittances in 2009

	OLS (1)	OLS (2)	Heckman two-step (3)	Heckman MLE (4)
Migrant is male	0.434 (0.325)	0.477 (0.296)	0.476 (0.254)*	0.476 (0.296)
Migrant is skilled laborer	0.585 (0.313)*	0.701 (0.321)**	0.701 (0.291)**	0.702 (0.422)*
Number of children at destination	-0.134 (0.202)			
Destination is urban	-0.197 (0.423)	-0.122 (0.403)	-0.122 (0.385)	-0.122 (0.351)
Reported illness, past 12 months	0.294 (0.363)	0.123 (0.388)	0.124 (0.362)	0.124 (0.374)
Reported death at destination, past 12 months	-0.315 (0.341)	-0.321 (0.374)	-0.321 (0.324)	-0.321 (0.338)
Reported rising food prices	-0.611 (0.269)**	-0.537 (0.274)*	-0.536 (0.285)*	-0.536 (0.337)
Adult sons of head	-0.296 (0.177)	-0.335 (0.187)*	-0.335 (0.134)**	-0.335 (0.165)**
Adult daughters of head	-0.043 (0.197)	0.062 (0.183)	0.062 (0.176)	0.062 (0.178)
Tropical livestock units (TLUs) per capita	0.019 (0.057)	0.023 (0.050)	0.023 (0.057)	0.023 (0.070)
Land per capita	-0.015 (0.187)	-0.044 (0.166)	-0.044 (0.164)	-0.044 (0.185)
Age of household head	0.080 (0.140)	0.107 (0.126)	0.108 (0.120)	0.108 (0.179)
Literacy status, head	-0.069 (0.315)	-0.115 (0.313)	-0.116 (0.267)	-0.116 (0.336)
Migrant was farmer in 2004/05	-1.023 (0.551)*	-0.961 (0.509)*	-0.962 (0.535)*	-0.962 (0.488)**
p-value, destination effects	0.028	0.006		
p-value, origin effects	0.444			
p-value, year moved effects	0.052	0.028		
Inverse Mills ratio			0.003 (0.569)	0.004 (1.011)
Number of obs.	94	94	268	268

Source: Authors' calculations from Ethiopian Rural Household Survey, 2009, and migrant tracking survey, 2009.

Notes: Columns (1) and (2) use OLS (ordinary least squares) in estimation; columns (3) and (4) use the Heckman selection method (MLE, maximum likelihood estimation). Standard errors in parentheses are corrected for clustering at the neighborhood level, except when using the Heckman two-step method. * indicates significance at the 10 percent level; ** indicates significance at the 5 percent level.

We present results from the Heckman procedure in columns (3) and (4), using both a two-step estimation procedure and a maximum likelihood procedure. The inverse Mills ratio is not significant in either model, indicating that selection does not appear to affect the level of remittances. Consistent across all four estimation methods, we find four variables that appear to be related to the level of remittances. First, skilled laborers appear to remit more; according to the two-step model, among skilled laborers remittances are 0.701 log points higher than among others who remit. We find a negative coefficient estimate on the number of sons of the household head, indicating that perhaps if there are a number of adult sons, migrants feel it is less necessary to support their parents. We also find negative coefficients on the food price shock variable measured at the destination, which is interesting given that this variable was positively related to remittance receipt by the household. This finding may still be in line with the self-insurance hypothesis; under the conditions of rising food prices, migrants might want to send money back to insure themselves but the amounts are constrained by income. Finally, we find that individuals who were farmers prior to leaving send back less remittances, though these coefficients are normally only significant at the 10 percent level.

In summary, we find potential evidence of two motivations for migration, primarily from the regressions explaining the probability of a remitting. The results on the food price increase variable are indicative of a self-insurance motive. Additionally, the probability of remitting also is responsive to ownership in livestock assets, suggestive of the bequest motive. The latter finding is in line with Hoddinott (1994), who finds evidence of the bequest motive through a land asset measure.

Robustness Checks

As mentioned earlier, it becomes difficult to isolate the effects of motives driven by distinctions in migrants' preferences or risk aversion when using cross-sectional information on migrant behavior. In effect, we are unable to rule out competing hypotheses such as one's altruistic tendencies without being able to explicitly characterize such a variable in the empirical specification or at least control for individual idiosyncrasies.¹¹ Multiple motives can underlie the interpretation of a single coefficient; for instance, both altruistic and bequest motives are underlying the interpretation of the single coefficient of inheritable assets in the Osili (2007) study. Although Osili attributes the negative coefficient to altruism, the presence of altruism does not mean that the bequest motive is nonexistent. Rather, the net effects of inheritable assets on remittances are negative. These discrepancies are what motivate Osili to further inspect investments and savings in the origin and host countries to corroborate or rule out altruistic tendencies with evidence regarding additional relevant outcomes.

Using a similar rationale to Osili's, our first robustness check to validate the self-insurance motive is to examine whether the migrant's own risk is correlated with outcomes that reflect his or her intent to return, using information from the migrant tracking survey (Table 4.3). The idea is that if the individual is indeed interested in self-insuring, then we would also expect his own risk to be correlated with how frequently he maintains contact with the village and his intent to return to the village. Interestingly, we still observe a positive correlation of livestock inheritable assets and visiting the village regularly with intent to return, suggestive of the bequest motive. However, we do not observe any correlation between one's contact with the village or intent to return to the village and one's own risk.

Our second robustness check primarily targets the self-insurance motive. Given that an individual's perceptions of vulnerability may be captured by the indicator variable for facing a food price

¹¹ One could argue that the spirit of altruism always underlies the motives to remit. Previous studies test for the presence of altruism using explanatory variables as proxies. For example, Osili (2007) attributes the negative correlation between one's inheritable assets and the amount of remittances sent to the presence of altruism, meaning altruistic tendencies incline migrants to transfer more when their households are poor. Similarly, Ameudo-Dorantes and Pozo (2006) interpret the positive correlation between the origin household's size and remittance amounts as the presence of altruistic motives. While the interesting contribution of these studies is the analysis with a matched sample because they have information on the origin household and migrant, which allows for various controls to reduce the potential for omitted variable bias, they are still subject to biases that arise with the use of cross-sectional data. It is also possible to test directly for altruistic motives through the design of behavioral experiments.

increase, we might be concerned that this result is affected by omitted variable bias. To deal with this concern, we replace the high food price variable with actual measures of changes in food prices at the reported destination. We choose two of the most important prices, the price of teff and the price of maize, as substitutes for the high food prices indicator.¹²

Table 4.3—Regressions explaining contact with and intent to return to ERHS villages, 2009

	Maintained contact in the last year (1)	Returns to village regularly (2)	Intends to return to live in ERHS village (3)
Migrant Characteristics			
Male	0.106 (0.236)	-0.181 (0.196)	0.471 (0.196)
Skilled laborer	0.833 (0.341)**	0.159 (0.202)	-0.273 (0.254)
Shocks to Migrant			
Reported illness, past 12 months	0.573 (0.443)	-0.321 (0.249)	-0.414 (0.350)
Reported death at destination, past 12 months	0.075 (0.365)	0.004 (0.305)	-0.002 (0.411)
Reported rising food prices	-0.311 (0.203)	0.053 (0.199)	-0.040 (0.219)
Household Characteristics			
Adult sons of head	0.018 (0.085)	0.021 (0.079)	0.084 (0.062)
Adult daughters of head	0.539 (0.195)	-0.078 (0.109)	0.287 (0.112)
Tropical livestock units (TLUs) per capita	0.013** (0.050)	0.106 (0.043)**	0.081 (0.032)**
Land per capita	-0.110 (0.165)	-0.468 (0.157)**	-0.485 (0.147)**
Age of household head	-0.061 (0.080)	0.097 (0.066)	0.090 (0.078)
Literacy status, head	-0.417 (0.206)	-0.106 (0.189)	0.097 (0.200)
Migrant was farmer in 2004/05	0.100 (0.267)	-0.008 (0.296)	0.358 (0.264)

Sources: Migrant tracking survey, 2009, and Ethiopian Rural Household Survey, 2004/05.

Notes: Estimation is by probit method. Standard errors clustered at the neighborhood level in parentheses. ** indicates significance at the 5 percent level.

We estimate the relationship between the indicator for remittances and the indicator for prices using the probit method, as in Table 4.1 (Table 4.4). We find that once we control for other variables at the migrant and source household levels, included in column (4) of Table 4.1, maize prices are positively correlated with the probability of sending remittances, but teff prices do not appear to be correlated with remittance behavior (Table 4.4, column 3). These results are at least weakly suggestive that migrants send back remittances with a self-insurance motive in mind.

¹² We also tested other prices, but some destination-level prices were highly correlated with one another and therefore estimates with more prices included were susceptible to multicollinearity.

Table 4.4—Reduced form regressions correlating likelihood of remitting with grain prices at destination, 2009

Price	(1)	(2)	(3)
Teff price, destination	-0.059 (0.137)	-0.023 (0.148)	-0.004 (0.137)
Maize price, destination	0.302 (0.200)	0.338 (0.196)	0.426 (0.205)**
Migrant variables?	no	yes	yes
Source household variables?	no	no	yes
Number of obs.	270	270	268

Sources: Migrant tracking survey, 2009, and Ethiopian Rural Household Survey, 2004/05.

Notes: Estimation is by probit method. Standard errors clustered at the neighborhood level in parentheses. ** indicates significance at the 5 percent level.

5. DISCUSSION AND CONCLUSION

Remittances are potentially an auxiliary source of income for households in rural areas of Ethiopia and furthermore are not subject to local agricultural shocks. In this paper, we have studied motivations behind remittance behavior among migrants from ERHS villages using a matched sample of migrants and source households. We find evidence consistent with two hypotheses found in the literature. First, migrants appear to send remittances in response to one specific shock, increasing food prices. Although we find that the probability and level of remittances appear to increase with variables that proxy for migrant wealth, such as skilled employment, we otherwise do not find that migrants are remitting to guarantee the source household a steady stream of income. Second, we find that remittances are more likely and larger if source households have more livestock, but not more land. The latter result is at least weakly suggestive of a potential bequest motive underlying remittances.

One issue that became clear in the introduction and warrants further discussion is why migrants are not likely to send back remittances in Ethiopia. The best method we have available is to consider the primary results of the remittance indicator variable, but in reverse. Perhaps the most interesting finding, from this perspective, is that individuals are less likely to remit if they do not have skilled employment. In fact, only around one-third of migrants have skilled employment, and about 75 percent of those with skilled employment remit. From the migrant perspective, it could simply be that those who do not have skilled employment have living standards at the destination that are similar to standards in the source village. Therefore, it might not be surprising that they do not remit as a rule; even if migrants with and without skilled employment are both altruistic, it might not make sense for unskilled migrants to remit in the presence of transaction costs when remitting.

We do, however, find that remittance probabilities and levels are both positively correlated with livestock holdings. Although this result is suggestive of a potential bequest motive underlying remittances, it is at odds with findings related to land; landholdings at the source are likely to be far more valuable than present livestock holdings. One potential explanation for this discrepancy is that the migrants might perceive themselves as part owners of any livestock and therefore become more likely to send back remittances to households to ensure they receive returns to larger livestock holdings (such as cattle). Alternatively, it could be that households with larger livestock holdings face higher liquidity constraints, due to the need to feed and care for their livestock. Sending out migrants in these cases could be a specific component of the overall household income portfolio, to ensure that liquidity is available to keep up the livestock herd. This hypothesis is consistent with the household-level finding that the level of remittances increases as the size of the livestock holdings increases. However, it would be necessary to do further research to disentangle any of these explanations for this positive correlation.

Therefore, we conclude that migrants appear to remit in part for precautionary motives in Ethiopia. There are two avenues of further research suggested by this paper. First, although our matched data allowed us to control for one possible source of omitted variable bias, we do not have a source of random variation to exploit to confirm or reject the precautionary motive hypothesis. Using a matched sample, one could design an experiment to test whether migrants would send a positive shock to their earnings, or a portion thereof, to the source household, potentially by having sample migrants enter a lottery, with a specific follow-up of source households. Second, it is important to assess whether living standards improve for both migrants and source households as a result of migration. Households that send out migrants could benefit either through remittances or through the removal of one household member, improving the resources available per member. Migrants might simply not remit because their living standards in general at the destination are not all that different; given the amount of rural–rural migration in Ethiopia, this explanation seems plausible, though a question for further research.

APPENDIX

Table A.1—Source household characteristics by tracking status

	Has tracked migrants			Untracked migrant hhs			Mean diff. untracked-tracked t-test
	N	Mean	SD	N	Mean	SD	
Household wealth and demographics							
Number of oxen owned	213	1.033	1.272	47	1.064	1.436	0.13
Tropical livestock units (TLUs)	218	3.840	4.069	50	3.664	4.109	-0.27
Land (hectares)	219	1.569	1.627	50	1.605	1.588	0.14
Sons	221	2.068	1.572	51	2.020	1.543	-0.21
Daughters	221	1.670	1.472	51	1.588	1.236	-0.46
Adult sons	221	0.977	1.068	51	0.745	0.796	-1.77*
Adult daughters	221	0.538	0.823	51	0.451	0.730	-1.02
Network outside of village dummy	221	0.348	0.478	51	0.235	0.428	-1.40
Head of household characteristics							
Amhara ethnicity	218	0.289	0.454	50	0.220	0.418	-1.10
Oromo ethnicity	218	0.239	0.427	50	0.240	0.431	0.02
Tigrayan ethnicity	218	0.119	0.325	50	0.140	0.351	0.52
Gurage ethnicity	218	0.083	0.276	50	0.060	0.240	-0.50
Kembata ethnicity	218	0.096	0.296	50	0.080	0.274	-0.32
Welayta ethnicity	218	0.078	0.269	50	0.140	0.351	0.80
Gedeo ethnicity	218	0.032	0.177	50	0.020	0.141	-0.91
Gamo ethnicity	218	0.014	0.117	50	0.040	0.198	1.12
Erob ethnicity	218	0.009	0.096	50	0.020	0.141	0.51
Argoba ethnicity	218	0.014	0.117	50	0.020	0.141	0.29
Orthodox Christian	220	0.573	0.496	48	0.521	0.505	-0.72
Muslim	220	0.145	0.353	48	0.271	0.449	1.77*
Protestant	220	0.209	0.408	48	0.188	0.394	-0.34
Age	219	53.872	13.211	50	50.040	11.981	-1.93***
Literate	212	0.307	0.462	50	0.280	0.454	-0.36
Primary job is in agriculture	219	0.758	0.429	50	0.840	0.370	1.37
Exposure to shocks							
Self-reported drought shock in 2000†	218	0.344	0.476	51	0.294	0.460	-0.85
Self-reported pest shock in 2000†	218	0.128	0.335	51	0.137	0.348	0.16
Self-reported food price shock in 2000†	218	0.459	0.499	51	0.451	0.503	-0.10
Self-reported death shock in last five years†	221	0.190	0.393	51	0.157	0.367	-0.57
Self-reported illness shock in last five years†	221	0.249	0.433	51	0.353	0.483	1.47
Number of months in last year was unable to satisfy food needs of household	214	2.318	2.067	50	3.000	2.680	1.94*
Household suffered shortage of food last rainy season	218	0.596	0.492	50	0.660	0.479	0.94

Source: All variables come from ERHS 2004/05 round unless indicated.

Notes: † indicates from ERHS 2009 round. T-statistics use village-clustered standard errors. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

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