On Altruism and Remittances

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Abstract

We provide a direct test of the impact of altruism on remittances. From a sample of 105 male migrant workers from Kerala, India working in Qatar, we elicit the propensity to share with others from their responses in a dictator game, and use it as a proxy for altruism. When the entire sample is considered, we find that only migrants' income robustly explains remittances. Altruism does not seem to matter. However, we document a strong positive relationship between altruism and remittances for those migrants that report a loan obligation back home, which is nearly half the sample. We explain the role of loan obligations with a standard remittance model, extended with reference-dependent preferences.

Keywords: remittances, altruism, reference-dependent preferences, dictator game, Qatar. *JEL codes*: O12, O15, D81

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1. Introduction

Monetary remittances by migrants constitute a behavior of significant economic importance. In 2012, cross-national remittances to developing countries were estimated to be over $400 billion, with almost $70 billion in remittances to India alone. In Tajikistan, Lesotho, Moldova, Samoa, the Kyrgyz Republic, Nepal, Tonga, and Lebanon, remittances currently account for a proportion of between 20% and 47% of GDP.[1] Economic studies report a strong impact of remittances on economic growth, business cycles, and the financial development of remittance-receiving countries.[2]

However, despite their economic impact, the motives driving remittances are not well understood. Among the plausible motives, altruism is one of the most prominent (see Stark (1995); Rapoport and Docquier (2006); Carling (2008)). Yet, altruism is difficult to measure directly. Therefore, to determine the importance of altruism as a motive for remittances, economists have traditionally relied on indirect tests. For example, in their seminal paper, Lucas and Stark (1985) propose a common test to discriminate between two alternative models of remittances based on different motives: a model based on altruism and another based on self-interest. Both models predict that remittances increase with the migrant's income, but only in the altruistic model do remittances decline as the recipient household's income rises. Therefore, to assess whether altruism is a relevant motive, they propose to test whether remittances decrease in the household's income.[3]

[1] Source: "Migration and Development Brief, No. 20" The World Bank, April 19, 2013.

[2] For recent evidence, see Agarwal et al. (2011); Mandelman and Zlate (2012); Guiliano and Ruiz-Arranz (2009); Bettin et al. (2012); for a review, see Yang (2011); Rapoport and Docquier (2006).

[3] Also see Agarwal and Horowitz (2002); Bouhga-Hagbe (2006); Osili (2007); Melkonyan and Grigorian (2012) for other discussion of the altruistic motive in remittance behavior.

Such indirect tests, however, face three limitations. First, alternative models of remittances may also predict that the amount remitted is negatively correlated with the recipient household's income. For example, Stark (1995, Ch. 4) presents a strategic motive for remittances and migration, which also predicts a negative relationship between remittances and household income.[4] Second, a non-negative relationship between remittances and the household's income cannot rule out the altruistic motive if past remittances, driven by altruism, substantially raised present household income (Lucas and Stark (1985)). Third, even if a negative correlation between remittances and household income supports the altruistic motive over alternative ones as a reason for remittances, we still cannot assess the direct importance of altruism as a motive rather than one of possibly many causal factors. That is, at best we learn of the direction of the relationship, but not necessarily of the magnitude or importance.

To address these limitations in current methods, our study provides, to the best of our knowledge, the first direct test of the impact of altruism on remittances. To do so, we administered a survey and conducted a behavioral experiment using 105 male migrant workers from Kerala, India working in Qatar.[5] The behavioral experiment consisted of tasks measuring social preferences, including a dictator game, in which each participant received 100 Qatari Riyals (approximately, US $27) and decided how much of that amount to give to another, anonymous individual. From their responses, we elicit the propensity to share with others and use

[4]Rapoport and Docquier (2006) and Cox and Fafchamps (2007) provide further examples.

[5]While our sample is smaller than that in many other studies of migrant remittance behavior (see, e.g., Lucas and Stark (1985); Funkhouser (1995); Agarwal and Horowitz (2002), but also see Osili (2007) that uses sample size similar to ours), our design employs behavioral tasks which take time to administer and for which subjects are paid. This necessarily limits our feasible sample size to one comparable to those used in laboratory experiments.

it to proxy for each participant's degree of altruism.[6]

On many dimensions, the migrants in our sample form a homogeneous group. They are all male, married workers from the same state in India, who have either partially or fully completed secondary education, and are of a similar age. In addition, the characteristics of their households in India are also homogeneous. A vast majority of migrants (84%) report that there is no other income in the household in India, which typically has 3 to 4 members and a home of a comparable quality.

Yet, these seemingly identical migrants differ in one very important dimension that will play a significant role in our analysis. About half of them report having an explicit loan obligation back home. These loan obligations are economically significant – for example, related to the acquisition of a family home. Nonetheless, migrants who do and do not have loan obligations tend to be very similar with respect to their socioeconomic background and their reported priorities for remittances, which are typically home related.

Our main objective is to investigate whether the measured variation in altruism across migrants helps to explain the observed variation in remittance behavior. In contrast to the common perception, for the entire sample we find no relationship between altruism and remittances. This finding, nevertheless, accords with the complex interdependence of various factors and motives for remittances that, unless accounted for, can annihilate the effect of the altruistic motive (for a general discussion, see Stark (1995); Rapoport and Docquier (2006); Yang (2011)). In this study, we uncover one such confounding factor—the possession of a loan

[6]This measure of altruism is widely employed in the behavioral economics literature (e.g. Forsythe et al. (1994); Camerer (2003)). We also employed other behavioral tasks – public good, investment, and ultimatum games – which measure more complex social preferences, such as reciprocity.

obligation. We find that remittances rise with the degree of altruism only for the migrants with a loan obligation. Specifically, the estimated remittance schedule has a smaller intercept and a larger coefficient of altruism for the migrants with a loan obligation than for those without. As a result, we observe that at a low degree of altruism, migrants with a loan obligation remit less than those without, and *vice versa*. Finally, among other variables considered, only migrants' income robustly explains remittances: For every dollar earned, migrants remit, on average, about sixty cents.

We argue that our empirical findings related to the possession of loan obligations are in line with the traditional model of the altruistic motive (Lucas and Stark (1985); Stark (1995, Ch. 4)) extended with reference-dependent preferences. In particular, we characterize a migrant's utility from remittance with a gain-loss function as in Kőszegi and Rabin (2006). The reference point can be thought as the amount of money that the migrant is expected to send home, as determined by existing obligations, family needs, or social comparisons. We discuss the salience of reference dependence for remitting behavior later in the text. We assume loss aversion (Kahneman and Tversky (1979)): A migrant experiences a positive utility if his remittance is above the reference point and a negative utility if below, with losses looming larger than gains.

If migrants without a loan obligation face more uncertainty about the reference point for remittances, an assumption that we justify later in the text, we show that the theoretical predictions of the model closely match our empirical results. At low levels of remittance, an increase in uncertainty about the reference point prompts loss-averse migrants to remit more in order to avoid the risk and resultant disutility of falling short of the expectations. At high levels of remittance, this risk is negligible and, with the diminishing utility of remittances above the reference point, the relationship between remittances and increasing uncertainty

turns negative as migrants prefer more private consumption. Thus, the model predicts a flatter remittance schedule in altruism for migrants without loan obligations in accordance with our empirical results. From a different perspective, the altruistic motive can be diminished by loss aversion coupled with uncertainty about remittance expectations.

The remainder of the paper is organized as follows. In Section 2, we describe the data and compare the characteristics of migrants that report an explicit loan obligation to those that report none. Section 3 presents the empirical analysis. In Section 4, we discuss reference dependence and offer an interpretation of our results. The last section concludes the study.

2. Data

Our data come from two sources. First, data on migrants' personal and household characteristics, their remittances, savings, consumption, and loans were collected through an extensive survey administered between May and June 2012 among migrant workers in Doha, Qatar. To limit heterogeneity, we considered only married migrant blue-collar workers from Kerala, India whose spouses remained behind, and a vast majority of whom had at most a high-school degree. A total of 204 surveys from across seven labor camps were completed.

Our second source of data comes from behavioral experiments we conducted with a subset of the migrant workers who had completed the survey. Specifically, a few weeks after the surveys were completed, we invited all migrants who took the survey to come to the campus of the Georgetown University in Doha and participate in a series of behavioral games. Transportation was provided. A total of 105 migrants accepted the invitation.[7]

[7]Although we invited the migrant workers to come to campus on a weekend, some of them had to go to work, which explains the attrition.

At the session, migrants played the public good, trust, dictator, and ultimatum games. For the present study, which focuses on altruism, we only consider behavior in the dictator game. In this game, the participants were randomly matched in pairs, but the identity of the paired participant was never revealed. Each participant was then asked to decide how much of a 100 Qatari Riyal endowment (approximately US $27, the equivalent of about two-days worth of the average migrant's salary) he would share with his anonymous partner.[8] The mean and median transfers made in the dictator game were 37% and 40% of the endowment, respectively.[9]

Table 1 provides descriptive statistics for our sample of 105 migrants. By design, there is no variation in gender, place of origin, and marital status, and little variation in education. Some variation exists in migrants' salary, age, years in Qatar, expected time remaining until return to India, household income, and household size. In addition, 44% of the migrants report an explicit loan obligation back home, while 56% report none.

Loans

One of the findings of this study is that loan obligations can potentially affect remittance behavior. Therefore, before we present the empirical analysis we provide a short description of the loans and a comparison between the migrants in our sample with an explicit loan obligation and those without.

In our sample, 46 migrants (44%) report having a loan obligation back home.

[8]The English translation of the instructions of the dictator game from Malayalam is available upon request. Along with written instructions, in their own language, the participants were also shown voiced PowerPoint presentations about the games played. Additionally, there were Malayalam-speaking assistants trained to help participants in better understanding the games.

[9]These numbers fall within the range of mean and median offers observed in similar studies, which is between 10% and 50% (see Camerer (2003, Table 2.4, pp 57–58)).

Based on (i) migrants' personal characteristics, (ii) household characteristics, (iii) information on their residence, and (iv) information on other assets in the possession of the household, we observe that these migrants are essentially indistinguishable from the migrants who do not report any loan obligations (see Table 2). In all but one variable ("own telephone") the difference between the migrants with loans and those without is statistically insignificant at the $p < 0.05$ level (see the last column of Table 2). Both types of migrants, on average, earn between \$6,000 to \$7,000 per year, remit around \$3,400, are 40 years old, and have been in Qatar for 5 to 6 years. Moreover, both types of migrants exhibit the same average degree of altruism as shown by the share (37%) of the endowment that they offered in the dictator game. The representative migrant in each group comes from a household of four individuals and owns a home with a cement roof that has 3 bedrooms and 2 bathrooms.[10]

The two groups of migrants are also similar with respect to their preferences for spending. In particular, 76% of the migrants with a loan reported that the loan was taken to "buy a house, repair/build a house, or buy land" (see Figure 1 that shows migrants' reasons for existing loans). Similarly, when asked how the household plans to spend future savings, 73% of the migrants without a loan reported that they would like to "buy a house, repair/build a house, or buy land." Next, we compare how remittances were spent by households for each of the two groups of migrants. The migrants were asked to report the expenses, made out of their remittances, for different spending categories (including savings) during the last 12 months. A summary of the results is available in Figure 2. Panel A shows average dollar spendings by expenditure category and loan type, and Panel

[10]Not surprisingly, we were unable to link any of the background characteristics and degree of altruism to the likelihood that a migrant will have a loan. Results from the probit specification are available upon request.

B shows average corresponding expenditure shares of each group. As expected, we observe that migrants without loans save more, but they also spend more under each category both in absolute and relative numbers. However, if we take the post-repayment remittances and then compare the expenditure shares between the two groups, then, except for the savings category, we see much similarity among the migrants irrespective of whether they have a loan obligation or not.[11]

3. Empirical Model

We now turn to our study of how migrant characteristics, and particularly altruism, affect remittances. We first investigate how migrants' background and household characteristics affect remittances. Consider a standard remittance specification[12] that excludes altruism

$$\ln R = a + X\beta + Z\gamma + \varepsilon. \tag{1}$$

Above, $\ln R$ is the log of the annual remittances; X is a vector of migrants' background characteristics (income, age, education, and years employed in Qatar); Z is a vector of household characteristics (income, total savings and size)[13]; and ε is a normally distributed error term. A dummy variable is used to measure educational attainment, with a value of 1 if the migrant sought post high-school education,

[11] Arguably, Figure 2 points to a savings commitment problem among the migrants without loan obligations, as their total savings are less than the sum of savings and loan repayments of the migrants with a loan obligation. This observation is in line with the study of Bauer et al. (2012) on microfinance loans in India, where they argue that the microcredit innovation may also help in fostering self-discipline in financial behavior.

[12] See Rapoport and Docquier (2006) and references cited therein for common methodologies of modeling remittance behavior.

[13] Household savings are the sum of savings in the form of cash, bank and postal accounts, stocks, ROSCA funds (chitty), life insurance plans, market value of gold, and value of land holdings.

and 0, otherwise. The results for the pooled sample and for the No Loan and Have Loan groups are reported in columns 1, 2, and 3 of Table 3, respectively.

In all three models, migrants' income is the only statistically significant explanatory variable at conventional levels ($p < 0.05$). For every dollar earned, migrants remit home about 60 cents. No other characteristic seems to matter. However, there appear to be some differences for the two groups, in models 2 and 3. In particular, if we look at economic significance, we observe that for age, education, and household size the coefficients collapse toward 0 for the group of migrants with a loan obligation. This hints at the possibility that two different models are needed to explain the behavior of migrants with and without loans.

Given that apart from a migrant's income, his background and household characteristics do not seem to explain remittance behavior, we proceed to investigate whether a direct measure of altruism provides any explanatory power. Additionally, to motivate our next specification, we provide scatter plots of altruism and remittances across the two groups of migrants in Figure 3. We observe that for the migrants who report a monthly loan obligation (left diagram), remittances increase in altruism.[14] However, for those without an explicit loan obligation (right diagram), altruism is uncorrelated with remittances.

Our specification that accounts for altruism is as follows

$$\ln R = a_0 + a_1 \ln Y + a_2 LOAN + a_3 ALTR + a_4 ALTR * LOAN + \varepsilon, \qquad (2)$$

where $\ln Y$ is the log of the annual income of a migrant; LOAN is a dummy variable that takes the value of 1 if a migrant reports a monthly loan obligation and 0, otherwise; and ALTR, a proxy of altruism, is the share of the endowment (in decimals) that a migrant offers in the dictator game.

[14]The scatter plot for the group with loans has an outlier. It has, however, no qualitative effect and only a marginal quantitative effect on our findings.

OLS estimates for various models of specification (2) are presented in Table 4. Columns 1–3 report the impact of altruism and of having a loan on remittance behavior for the entire sample. Without an interaction between these two characteristics – i.e., when considering the entire pool of migrant workers as homogeneous – neither having a loan nor being altruistic matters. However, when we interact loan obligations with altruism, we find that both the loan dummy and the interaction term matter, as shown in column 4. To check robustness, we included additional explanatory variables that were originally part of specification (1) in Table 3. As shown in column 5, the magnitude and statistical significance of the loan variable and altruism-loan interaction variable do not change.

Several observations can be made based on the empirical results. First of all, for the entire sample we find no relationship between altruism and remittances. But we find a positive and statistically significant relationship for the subsample of migrants with a loan obligation. Using estimates from column 5 of Table 4, for the migrant with a loan obligation a 10 percentage point increase in the contribution made in the dictator game translates into about a 3.5 percentage point higher remittance. Furthermore, a negative coefficient on the dummy variable for loans indicates non-trivial differences in the amounts remitted across the two groups depending on the degree of altruism. If a migrant is selfish (0% contribution), then he remits by 20% less if he has a loan, but if he is of the average degree of altruism (a contribution of 37%), then he remits by 4% more if he has a loan. In other words, the remittance schedule in altruism estimated for the group of migrants with loans crosses the corresponding schedule of the other group from below.

We also examine whether other variables, such as the ones in vectors X and Z in specification (1), have any explanatory power when interacted with the LOAN dummy. This can happen, for example, if the importance of these characteristics

varies across each group. The results are reported in Table 5. Each column represents a version of specification (2), in which the variable ALTR is replaced with a different variable. Aside from migrants' income, no other explanatory variable in these regressions is statistically significant at conventional levels.

4. Reference Dependence

The finding that altruism does not explain remittance behavior for the entire sample is in line with the view that the altruistic motive can be offset by other motives for remittances or various confounding factors. Our study presents one such confounding factor. Specifically, possessing a loan obligation influences remittance behavior and, particularly, the extent to which altruism is a factor in determining remittances. To provide an explanation for this finding, we turn to a model with reference-dependent preferences. The basic idea underlying this analysis is that an explicit loan obligation brings more certainty about the reference point for remittances.

The approach is to extend the standard remittance model (Lucas and Stark (1985), Stark (1995, Ch. 1)) with reference dependence. Here, we highlight the main ingredients of our model and introduce it formally in Appendix A. In the model, a migrant worker derives utility from own consumption and from his ability to remit enough to meet a reference point for remittances. Specifically, he experiences a psychological cost or gain if his remittance is below or, respectively, above a reference point, with losses looming larger than gains. The intensity of the psychological factor is in proportion to the migrant's degree of altruism. The reference point is the amount of money that the migrant is expected to send home, as determined by existing obligations, family needs, social comparisons, or other contextual circumstances. The reference point can be, however, uncertain, in which case the degree of uncertainty becomes an important factor for remittance

decisions (Kőszegi and Rabin (2006)).

Generally, utility theories of reference dependence are motivated by empirical evidence about the effects of contextual circumstances on the individual perception of utility. These effects are typically found to take the form of loss aversion with respect to some reference point, determined by the decision maker's current position and expectations, as well as by social norms and comparisons.[15] Regarding remittance behavior, similarly to other realms of economic behavior, there are strong reasons to believe that the subjective utility of remittances depends on contextual circumstances. Examples of such circumstances could be the history of remittances, individual or common beliefs about a "fair" amount of remittances, recipients' expectations or family pressures. For instance, according to Gardner (2012), a study on immigration to the Persian Gulf states, it is often family pressures that are responsible for the decision to emigrate and for the amount of remittances to be sent home. The anthropological study of Osella and Osella (2000) describes a local status categorization of migrant workers from Kerala, based on their ability to earn money abroad, and privileges associated with high status.

Returning to our study, we argue that possessing a loan obligation reduces uncertainty about the reference point for remittances. This assumption can be motivated in two ways. First, specifically to our study, we observe that the two types of migrants, distinguished by explicit loan obligations, have otherwise very similar socioeconomic backgrounds and consumption preferences. In particular, both types report the same purpose of their loans or savings/remittances. When asked about the purpose of their loans, 76% of the migrant workers with a loan obligation report to buy, build, or repair a house. All migrants without a loan list the same purpose among their top priorities. Thus, to the extent that satisfying

[15]Recent applications of reference-dependent preferences include Abeler et al. (2011), Crawford and Meng (2011), Pope and Schweitzer (2011).

this family need is a major influence on the expectation of how much should be remitted, then the presence of a loan obligation provides greater certainty about this expectation and the corresponding reference level for remittances. Second, and more generally, even if not exposed to explicit loan obligations, migrants are frequently bound by implicit family loan contracts, typically made to finance migration costs (for the relevance of such implicit loan contracts, see Poirine (1997)). Remittances are then considered as dividends from the family investment, but explicit financial requirements – which can include a loan obligation – create greater certainty about the exact size of expected dividends for which a migrant is responsible.

Then, assuming that migrants without a loan obligation face more uncertainty about the reference point is sufficient for the model to produce predictions that match our empirical findings. If a migrant remits a small amount, then because of uncertainty there is a risk that the amount remitted falls short of the reference point. An increase in uncertainty also increases this risk, which prompts a loss-averse migrant to remit more as a hedging measure against the increased risk. This explains the negative coefficient of the dummy variable for loans in our empirical results or rather why selfish migrants without loans remit more. Conversely, if a migrant remits a large amount, then the risk of falling short of the reference point is negligible even with an increased degree of uncertainty. Because of the diminishing marginal utility from remittances above the reference point and a low level of private consumption, an increase in uncertainty prompts a migrant to choose more private consumption and, as a result, to lower remittances. This explains our empirical finding that a migrant with sufficiently high degree of altruism and, thus, a high level of remittance remits more if he has a loan obligation, i.e., is more certain about the reference point. To put it differently, our model predicts a flatter remittance schedule in altruism for migrants without loan obligations in

accordance with our empirical results. Figure 4 illustrates the predictions of our model.

5. Conclusion

We study the relationship between altruism and financial remittances of migrants. We find that, overall, there is little evidence of a universal relationship between altruism and remittances. However, we do find that altruism can have a significant effect on remitting behavior for some migrants. This effect depends on accounting for a confounding factor—the possession of loan obligations. In particular, remittances rise in altruism only for migrants with explicit loan obligations.

To account for this pattern of findings, we postulate that for the migrants without loan obligations the importance of the altruistic motive is diminished by uncertainty and loss aversion. Namely, migrants without loan obligations are less certain about the expectations for remittances held at home than those with explicit loan obligations. As a result, when the risk of falling short of these expectations is significant, the former have to remit more in order to hedge themselves against the increased risk, and *vice versa*. Ultimately, these effects make them less responsive to any altruistic motive.

In parallel to the literature on reference-dependent preferences, the current study points to the importance of contextual circumstances for remitting behavior. As in other realms of economic behavior, in migration such circumstances can play an important role for the formation of reference points with subsequent effects on decisions. In our study, the contextual circumstance is the existence of an explicit loan obligation. As a consequence, two seemingly indistinguishable groups can exhibit very different behavior, based on different contextual circumstances and the effects that these have on reference levels. Funkhouser (1995) documents a striking and puzzling difference in migrants' remittances sent to El Salvador and Nicaragua

regardless of very similar country and migrant characteristics, which could possibly be another incidence of reference dependence and contextual circumstances.

More research on the importance of reference dependence and contextual factors for remittance behavior is needed. For instance, the remittance model with reference-dependent preferences could also yield novel predictions on the effects of networks in explaining remittance behavior. As a migrant worker spends a substantial amount of time interacting with his peers, the remittance behavior of his peers, who most often come from the same community back home, may potentially influence expectations and reference levels and, through these, may also influence the migrant's remittance behavior. That is, peers' remittances may serve as a reference point. Thus, in addition to accounting for migrant and household characteristics, understanding the formation of migrant networks may also be important in explaining remittance behavior.

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Appendix A. Model

The model presented below offers an explanation why the remittance equation for the group of migrants with explicit loan obligations can have a lower intercept but a higher coefficient of altruism. The model is a variation of the standard remittance model of Lucas and Stark (1985) refined with reference-dependent preferences.

Consider a migrant worker who has to divide his earned income $Y > 0$ between remittance $R \geq 0$ sent to his family and private consumption, $Y - R \geq 0$. The migrant's utility from private consumption is given by function $u(.)$ that satisfies $u'(.) > 0$, $u''(.) < 0$, and the Inada conditions $\lim_{x \to Y} u'(x) = 0$ and $\lim_{x \to 0} u'(x) = \infty$. The family's welfare from remittance R is given by function $\mu(R - \overline{R})$, where $\overline{R}$ is a reference point for remittances. We assume that $\mu(.)$ satisfies the properties of a "universal gain-loss function" in Kőszegi and Rabin (2006). Specifically, the migrant experiences a negative utility from remittance if $R < \overline{R}$ and a positive utility if $R > \overline{R}$, where utility losses resonate more than gains. The reference point $\overline{R}$ is uncertain and, for analytical convenience, assumed to be uniformly distributed over an interval $[r - e, r + e]$. The parameter e, $0 < e < r$, measures the migrant's uncertainty about the reference point.

Letting $\alpha > 0$ denote the migrant's degree of altruism, measured as the weight the migrant puts on the family's welfare, we write the migrant's total utility as

$$U(R; Y, e) = u(Y - R) + \alpha \int_{r-e}^{r+e} \mu(R - \overline{R}) \frac{1}{2e} d\overline{R}. \tag{A.1}$$

The optimal remittance level, $R^* = \arg\max_R U(R; Y, e)$, is determined by the first-order condition

$$-u'(Y - R^*) + \frac{\alpha}{2e} \int_{r-e}^{r+e} \mu'(R^* - \overline{R}) d\overline{R} = 0. \tag{A.2}$$

By the fundamental theorem of calculus and algebraic transformations, we get

$$-2eu'(Y - R^*) + \alpha \left(\mu(R^* - r + e) - \mu(R^* - r - e)\right) = 0. \tag{A.3}$$

We assume the existence of an interior solution, i.e., that the second-order condition (SOC) is satisfied (given the concavity of $u(.)$ and the properties of $\mu(.)$, this condition might not hold only under very specific circumstances). From (A.3), we can establish that remittances increase in altruism, i.e., the internal derivative $dR^*/d\alpha > 0$.

Now suppose that the migrant becomes less certain about the reference point $\overline{R}$, which we model by an increase in e. The effect of increased uncertainty on remittance is given by the internal derivative

$$\frac{dR^*}{de} = \frac{2u'(Y - R^*) - \alpha\left(\mu'(R^* - r + e) + \mu'(R^* - r - e)\right)}{SOC}. \tag{A.4}$$

The denominator of (A.4) is negative, but the numerator can be both positive and negative. In particular, it depends on the size of R^*. For small values of R^*, the first term, $2u'(Y - R^*)$, is small as the level of private consumption $Y - R^*$ is large. But, due to loss aversion, the second term can be large and dominate the first term, yielding $dR^*/de > 0$. Conversely, for high values of R^* the marginal utility of private consumption turns large, whereas the effect of loss aversion weakens, resulting in the negative sign of dR^*/de.

To illustrate our argument more precisely, rewrite (A.4) using (A.3) as

$$\frac{dR^*}{de} = \alpha\frac{\frac{1}{e}\left(\mu(R^* - r + e) - \mu(R^* - r - e)\right) - \left(\mu'(R^* - r + e) + \mu'(R^* - r - e)\right)}{SOC}. \tag{A.5}$$

For small values of e, the numerator can be approximated as

$$2\mu'(R^* - r) - \left(\mu'(R^* - r + e) + \mu'(R^* - r - e)\right). \tag{A.6}$$

For small values of R^* so that $R^* - r - e < 0$, the term in brackets dominates the first term as $\mu'(R^* - r - e)$ becomes large due to loss aversion, yielding $dR^*/de > 0$. The migrant increases the amount remitted to diminish the risk of falling short of

the reference point. For large values of R^* so that $R^* - r - e > 0$, the expression in (A.6) can be positive, yielding $dR^*/de < 0$. A sufficient condition for this is $\mu'''(x) < 0$ for $x > 0$. In words, with the diminishing impact of remittances once they are above the reference point, an increase in uncertainty results in a smaller amount remitted because the utility from overshooting the reference point (captured by $\mu'(R^* - r + e)$) is smaller than the utility from increased private consumption.

All in all, our model predicts a flatter remittance schedule in altruism for migrants that are less certain about remittance expectations. As argued in the main text, the case of explicit loan obligations can be related to a greater degree of certainty about the reference point for remittances. Then, the predictions of our model match the empirical patterns obtained.

Table 1 - Descriptive Statistics (%) for Sample Background (N=105)

Age		Occupation	
20-29	6	Carpenter	27
30-39	42	Driver	22
40-49	40	Electrician	12
50-59	12	Other	12
		Plumber	7
Religion		Construction laborer	6
Hindu	77	Mechanic	6
Christian	21	Plant operator	6
Muslim	2	Painter	3
Education		Household Members (excl. migrant)	
Upper Primary school	1	One	1
Some High school	28	Two	4
High school completed	61	Three	46
Some Pre-Degree	6	Four	27
Certification/Diploma	3	Five	18
Undergraduate degree	1	Six	4
Years in Qatar		Income (monthly, Qatari Riyal)	
< 1 year	26	< 1,000	4
< 2 years	13	< 2,000	51
< 3 years	11	< 3,000	37
< 4 years	6	< 4,000	6
< 5 years	8	4,000+	3
< 6 years	11		
6+	24	Bank Account in Qatar	
		Yes	24
Expected Time in Qatar		No	76
< 1 year	3		
< 2 years	2	Have Monthly Loans	
< 3 years	25	Yes	44
< 4 years	6	No	56
< 5 years	5		
< 6 years	6		
6+	31		
Don't know	29		

Table 2 - Summary Statistics by Loan Group

Group	All (1)	No loan (2)	Loan (3)	Difference (2) - (4)	T-test p-value
(i) Migrant Characteristics					
Annual income (in US $)	6'456	6'657	6'199	458	0.39
Annual remittances (in US $)	3'387	3'414	3'353	61	0.81
Age	40.24	40.49	39.91	0.58	0.70
Completed some post high-school education	10%	12%	7%	5%	0.36
Years in Qatar	5.29	5.69	4.76	0.93	0.41
Altruism (% of endowment offered)	37%	37%	37%	0%	0.92
(ii) Household Characteristics					
Annual income (in US$)	327	449	169	280	0.07
Savings (in US $)*	28'665	26'170	31'866	-5'696	0.24
Size (excluding the migrant)	3.70	3.81	3.54	0.27	0.16
(iii) Type of Residence					
Own home	99%	98%	100%	-2%	0.38
Number of bedrooms	3.02	3.00	3.04	-0.04	0.72
Number of bathrooms	1.77	1.78	1.76	0.02	0.85
Home has cement roof	90%	89%	92%	-3%	0.68
Renovating or building a new home	2%	2%	2%	0%	0.86
(iv) Other household assets					
Own motor car	5%	5%	4%	1%	0.86
Own motor cycle/scooter	14%	15%	13%	2%	0.75
Own Telephone (landline)	62%	71%	50%	21%	0.03
Own flat panel TV	35%	36%	35%	1%	0.93
Own DVD/MP3 player	90%	90%	91%	-1%	0.80
Own refrigerator	70%	71%	67%	4%	0.68
Own computer	6%	5%	7%	-1%	0.76
Number of Observations	105	59	46		

*Household savings refer to the value of land (83%), gold (11%), life insurance plan (4%), chitty (1%) and other (1%).

Table 3 - Regression: Remittances, Income, and Background Characteristics

Groups	All (1)	No loan (2)	Have loan (3)
Migrant's income (ln)	0.595*** (0.0711)	0.532*** (0.105)	0.668*** (0.0744)
Migrant's age (ln)	0.149 (0.120)	0.391* (0.221)	-0.0213 (0.147)
Migrant's education (post-high school dummy)	0.110 (0.0945)	0.128 (0.0943)	0.0483 (0.198)
Years employed in Qatar (ln)	-0.0287 (0.0330)	-0.0120 (0.0460)	-0.0274 (0.0374)
Household size (ln)	0.0506 (0.0790)	0.247 (0.166)	-0.00105 (0.103)
Household's annual income (ln)	0.375 (0.364)	0.498 (0.508)	0.342 (0.280)
Household's savings (ln)	0.0233 (0.0266)	-0.0217 (0.0397)	0.0522* (0.0274)
Constant	0.861 (2.652)	-0.0515 (3.655)	0.717 (2.411)
R-squared	0.560	0.472	0.773
Observations	105	59	46

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
All specifications include a dummy variable for households with no income in India.

Table 4 - Regression Results: Remittances, Income and Altruism

Version	(1)	(2)	(3)	(4)	(5)
ln Y	0.623***	0.617***	0.624***	0.614***	0.589***
	(0.0816)	(0.0765)	(0.0749)	(0.0688)	(0.0593)
LOAN	0.0357		0.0359	-0.232**	-0.232**
	(0.0382)		(0.0393)	(0.0942)	(0.103)
ALTR		-0.00449	-0.00887	-0.349	-0.405
		(0.141)	(0.142)	(0.237)	(0.248)
ALTR*LOAN				0.727**	0.753***
				(0.283)	(0.278)
Constant	4.139***	4.235***	4.128***	4.383***	1.009
	(1.023)	(0.980)	(0.957)	(0.896)	(2.708)
Other Controls	NO	NO	NO	NO	YES
R-squared	0.523	0.520	105	0.569	0.614
Observations	105	105	0.523	105	105

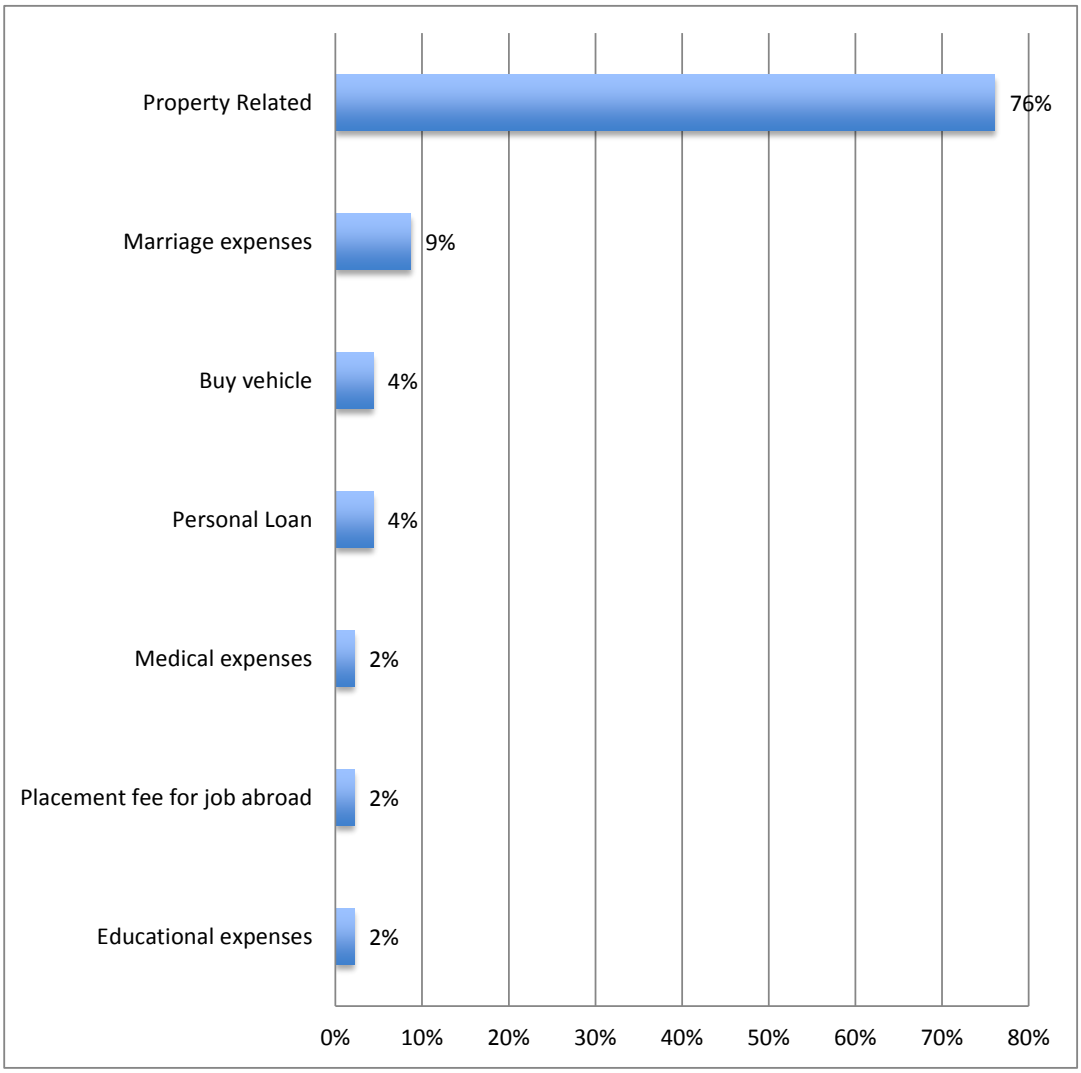
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
The set of controls are migrant's age (ln), having a post-high school qualification, years in Qatar (ln), household size (ln), household's annual income (ln), household's savings (ln) and a dummy for households without reported income in India.
In column 5, the sum of the coefficients on altruism and its interaction with the loan indicator is 0.349 with a standard error of 0.129, t-value of 2.69 and highly significant at conventional levels (p=0.008).

Table 5 - Regression: Remittances, Income, and Background Characteristics. Additional Specifications

Version	(1) X = Migrant Age	(2) X = Migrant Education	(3) X = Migrant Years in Qatar	(4) X=Household Income	(5) X = Household Savings	(6) X = Household Size
lnY	0.615***	0.598***	0.622***	0.620***	0.621***	0.628***
	(0.0810)	(0.0831)	(0.0775)	(0.0789)	(0.0799)	(0.0791)
Have_Loan	0.625	0.0408	0.0724	0.0198	-0.479	0.177
	(0.647)	(0.0380)	(0.0630)	(0.0350)	(0.532)	(0.238)
lnX	0.115	0.103	0.00470	-0.00151	0.00368	0.0877
	(0.140)	(0.0921)	(0.0440)	(0.0155)	(0.0464)	(0.144)
lnX*Have_Loan	-0.160	-0.0301	-0.0317	0.0216	0.0513	-0.109
	(0.177)	(0.197)	(0.0515)	(0.0176)	(0.0525)	(0.174)
Constant	3.814***	4.442***	4.144***	4.179***	4.125***	3.964***
	(1.190)	(1.038)	(0.999)	(1.002)	(0.998)	(0.985)
Other Controls	NO	NO	NO	NO	NO	NO
R-squared	0.526	0.531	0.526	0.532	0.536	0.526
Observations	105	105	105	105	105	105

The dependent variable is the log of remittances, lnR. Robust standard errors are in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

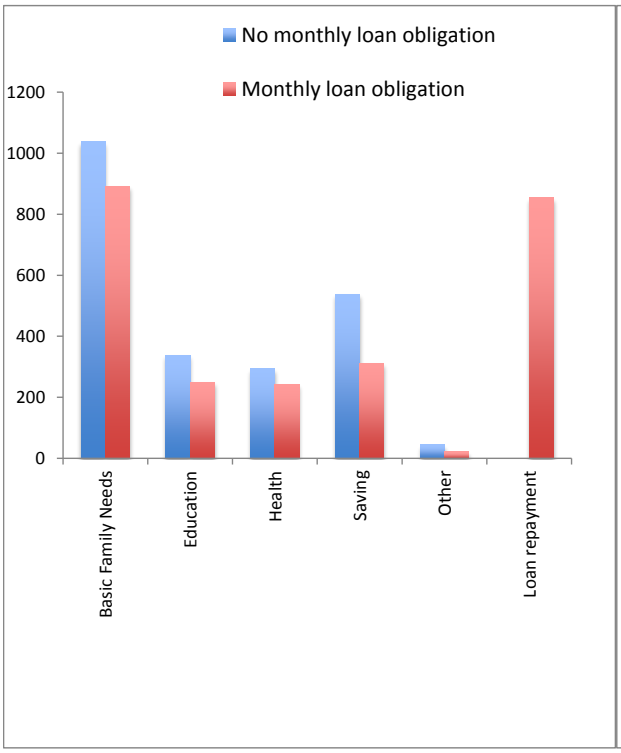
Figure 1 - Reason for Existing Loans



The figure above shows the reasons why 46 migrants in our sample took out a loan. Each row represents the percentage of these migrants that chose that answer as the reason for the loan. *Property Related* adds up the "Build a house" (30 individuals), "Buy a house" (3 individuals), "Repair a house" (1 individual) and "*Buy land*" (1 individual) explanations.

Figure 2 - Most Important Uses of Remittances over the Last Year by Loan-Type Group

Panel A: Average spending by category (in US $)



Panel B: Percentage of expenditure by category

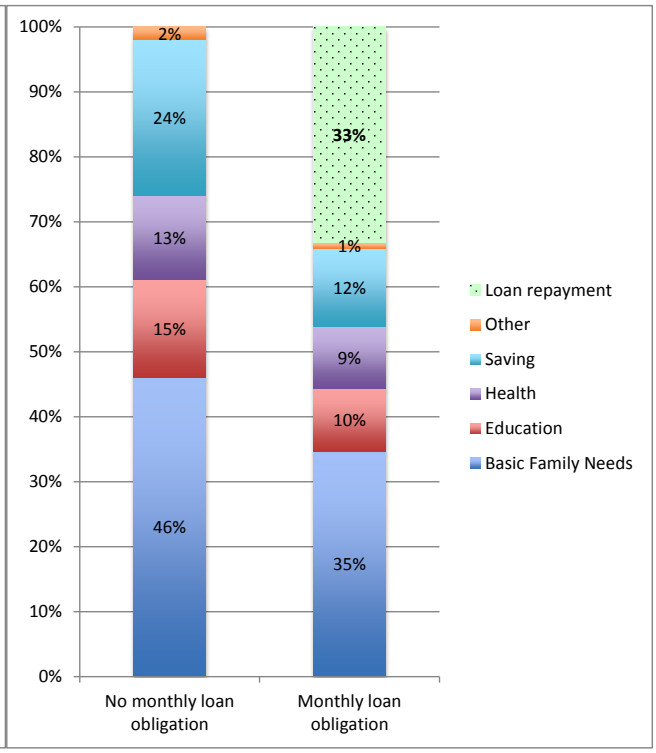


Figure 3 - Scatter Plot of Altruism and Remittances for Migrants With and Without Loans

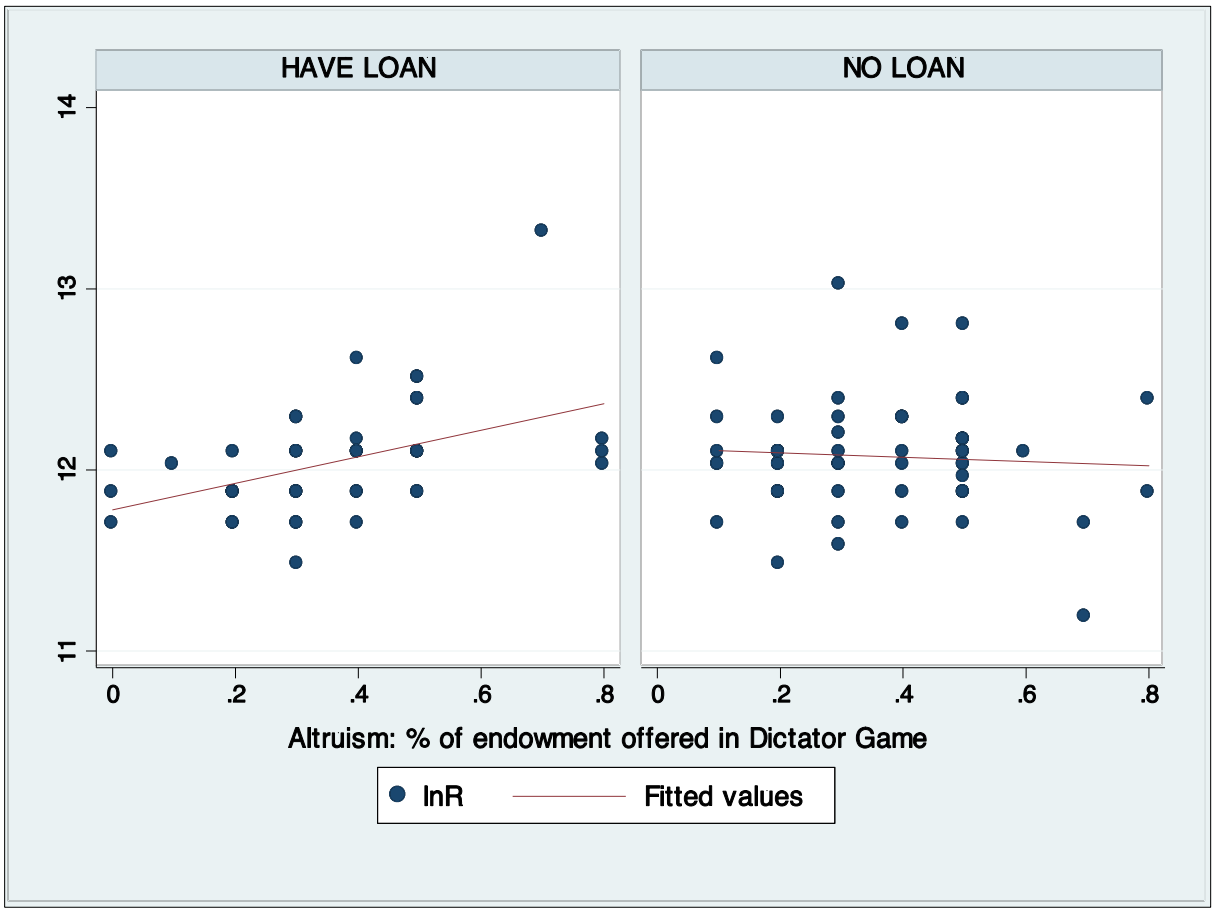


Figure 4 – Predicted Remittance Schedules in Altruism