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Remittances as investment in the absence of altruism

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Abstract

In the absence of altruism, there is no obvious reason why a migrant should remit part of his income to his family for investment at the home location. If the family invests such income (in housing for example), why would they give it back to the migrant when he returns? This paper is based on the idea that certain people at a migrant's home location may punish those families who do not return those investments in order to prevent their own possibilities of receiving future remittances and investments from being adversely affected. We find that in equilibrium we can have remittances to be invested and given back to the migrant and remittances for private consumption by the migrant's family even in the complete absence of altruism on either the part of the migrant or his family.
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Keywords: Remittances, Altruism, Migration.

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1 Introduction

Remittances from migrants to their families are a common occurrence in rural-to-urban migration and international migration from less developed to industrialised countries. This paper proposes a new explanation as to why remittances exist where altruism is absent.

The motives for the migrant to send income home can be classified according to the following three groups:

Purely altruistic. This is the most common explanation for remittances. Migrants care about the well-being of their family members who remain in their place of origin ; that is, the well-being of the family enters into the utility function of the migrant. The migrants will remit to maximize their own utility taking into account the well-being of their families (LaLonde and Topel, 1997; Lucas and Stark, 1985).

Another way to look at pure altruism is to consider the whole family as a single economic agent. Lucas (1997) shows that if the risks in the rural and urban environments[1] are uncorrelated, then the rural family can decide to send someone to the city to diversify the risk. Anytime one of the parties (rural or urban) experience negative consequences, remittances take place to maximize family utility.

Partly altruistic. These are explanations for remittances that depend on some degree of altruism but have self-interest features.

Andreoni (1989) says that a person may find utility in giving a gift (in this case, remitting) per se, regardless of the well-being of the receiver. That is, people have a taste for giving and derive utility from it.[2] Remittances are, therefore, caused by altruism as well as by this taste for giving.

Self-enforcing agreements are also used to explain remittances (Lucas and Stark, 1985; Lucas and Stark, 1988; Stark, 1989). Migrants face most of their risk in the early stages of migration and their families face a constant risk.[3] They insure each other, so that whenever there is a bad crop or the migrant faces unemployment, the other more stable party sends remittances. Another way of looking at self-enforcing agreements, is to see the family as a provider

[1] In many models of remittances, rural-to-urban migration takes place.

[2] This assumption was first made by Becker (1974).

[3] Again, rural-to-urban migration is assumed to take place.

of insurance for the migrant in the early stages of migration, when he faces higher risks; the migrant, therefore, remits as a form of premium payments. The migrant finds optimal it to remit even after his risk of unemployment has passed because he cares about his family (altruism). Another two reasons that reinforce such an agreement are the aspiration to inherit and the ongoing risks for the migrant.

When the migrant has some aspiration to inherit, assuming inheritance is conditional on behavior, the migrant may find it optimal to behave nicely remitting money home. The implication of this approach is that the larger the potential inheritance, the larger the remittances (Lucas and Stark, 1985). Altruism from the parents to the migrant is needed, otherwise they would not bequeath to him.

Stark and Falk (1998) explain remittances as a form of insurance against future risks. The idea is that the migrant is sending remittances causes the recipients to develop altruism towards him. Therefore, whenever the migrant faces unemployment, the recipient of the remittances will provide him with assistance. If the value of such an insurance is high enough, the migrant will remit even in the absence of altruism towards his family (or the recipient).

Pure Self-interest. Altruism is not needed in any of these explanations to obtain remittances as a result. It can, however, reinforce the result.

Lucas and Stark (1985) state that the intention to return home "may be suffice to promote remittance for investment in fixed capital such as land, livestock, or a house, in public assets to enhance prestige or political influence, and in what might be termed social assets—the relationship with family and friends."

Lucas and Stark (1985) and LaLonde and Topel (1997) point out that the migrant may want to invest part of his savings at home, trusting his family with the investment and maintenance decisions. Altruism from the family to the migrant "may underlie or enhance such a trust" (Lucas and Stark, 1985). The main problem of this idea is that there is no obvious reason, apart from altruism, for the family of the migrant to return the migrant's investment to him once he has returned. In this paper we show that altruism from the family is not necessary for this type of remittance to exist.

The idea is based on peer pressure literature (e.g., Kandel and Lazear, 1992). Not only might be people in the community be willing to punish families who do not return investments, they might also be willing to be

punished themselves. This is because, in this way, they can receive more remittances in the future and benefit more from better investments made by the migrants.

In section 2, we present a simple model: first within the migrant's family without social pressure, then with social pressure and finally with another families over time. In section 3, we present some empirical implications, followed in section 4 by conclusions and possible extensions.

2 Model

Let us assume that the migrant can make an investment at the beginning of the first period at home or at the foreign location. At the foreign location, for each unit invested he will receive r^* at the beginning of the second period. At home, he will receive $r(> r^*)$ but he is unable to make the investment without the help of a parent. His parent makes the investment for him and receive the returns at the beginning of the second period, at which time the parent decides how much to give the migrant who is then returning home.

We are assuming that the migrant can invest in a risk-free asset at both locations with a higher return at home. Since they are risk-free assets, this assumption may not seem realistic. However, since we are also assuming that the migrant returns home for the last period, we can think of some investments that may yield a higher economic value at home. One example is housing. Since building a house takes time, the migrant might prefer to buy a house at the time of his return but the supply of housing may be very scarce especially in small towns. So, the migrant might prefer to send remittances in order for a house to be built for him. Another example may be investment in his own business, which can yield a high return if the business has some market power. Both examples have the characteristic that the migrant has to return in order to receive the benefits of the investment.[4]

In the corresponding peer pressure literature there are two sources of pressure: internal (or guilt), and external (or shame) (Kandel and Lazear, 1992). Altruism can be interpreted as internal pressure since the individual has some disutility that results from behaving badly towards the other players, or from making other players worse off. In this model we will only deal

[4]We can think of the migrant selling his house or business, but there may be no good buyers for it in small towns.

with the external pressure or shame in the form of punishment (or reward) by the rest of the community.

We assume that wages are w^* in the foreign location, w_m in the home location for returning migrants (subscript m) and w_p in the home location for their parents (subscript p).

First we look at the decision process within a single family with no social pressure; we continue by adding social pressure at the family level, and, finally, we allow social pressure to come from sources beyond the family.

2.1 No social pressure

Each family consists of one migrant and his parent. The migrant lives the first period at the foreign location earning a wage w^* and returns to the home location for the second period in which he will earn a wage w_m. We assume that $w^* > w_m$ and that he returns for reasons exogenous to the model. Since the migrant's income is higher in the first period, he may save some of his income in the first period to increase his consumption in the second period. In this model we do not allow the migrant to borrow against future income because we assume that he migrated in order to get higher income at the foreign location.[5]

The parent lives both periods at the home location earning a wage of w_p. We can assume that $w_p < w_m$ to include the effect of the human capital that the migrant is likely to have acquired during his stay at the foreign location. We work without any restrictions on the home wages since it makes no sense to compare the wages of the migrant and his parent in the absence of altruism.

As stated above, the migrant can invest abroad or at home. Let $\rho^*(\geq 0)$ be the investment abroad and $\rho(\geq 0)$ be the remittance to be invested, so the consumption of the migrant in the first period is $w^* - \rho^* - \rho$. At the beginning of the second period the migrant will have $r^*\rho^*$ and the parent will have $r\rho$. The parent gives back $\alpha r\rho$ to the migrant, where $\alpha \in [0, 1]$. That is, α is the proportion of the investment plus the return at home that the parent returns to the migrant, keeping the rest. Note that as the parent is playing the role of a financial intermediary, we would normally expect that the migrant has to pay that service (i.e., $\alpha < 1$).

[5]In many international migration cases, the migrants move from a low-wage country to a high-wage country and borrowing money while they are earning a higher wage makes little sense if they eventually have to return with a lower income.

The model assumes that the parent consumes his share of the investment in the second period. Optimally, the parent would like to consume part of his share in the first period, since w_p is the same both periods. One of the reasons the parent may not keep all the remittance is that, if there are more periods with the migrant at the foreign location, the parent would want to behave well by investing in order to receive future remittances. We could assume that the migrant assigns a payment to the parent for his financial intermediation, which he can spend at any time. We did not assume this because it makes the model less clear and our results do not depend on this. So we are assuming that the parent waits until the second period to consume his share of the investment ($(1-\alpha)r\rho$).

Let the utility functions of the migrant (u_m) and the parent (u_p) be :

$$\begin{aligned} u_m = &\quad u_m(x_m^1) + \beta u_m(x_m^2) \\ u_p = &\quad u_p(x_p^1) + \beta u_p(x_p^2) \end{aligned}$$

where x_m^i is the consumption of a composite good by the migrant in period i and x_p^i is the consumption of the composite good by the parent in period i. The discount factor is $\beta \in [0,1]$. Marginal utilities are positive and both $u_m(\cdot)$ and $u_p(\cdot)$ are quasi-concave.

The timing of the game is as follows:

1 At the beginning of the first period, the migrant decides the amount to invest at the foreign location, ρ^*, and the amount to remit home to be invested, ρ. Both quantities are non-negative.

2 At the beginning of the second period, the migrant returns to the home location and the parent decides how much of the investment to keep ($(1-\alpha)r\rho$) and how much to return to the migrant ($\alpha r\rho$).

The payments are:

$$\begin{aligned} u_m(w^* - \rho^* - \rho) + \beta u_m(w_m + r^*\rho^* + \alpha r\rho) \quad &\text{for the migrant and} \\ u_p(w_p) + \beta u_p(w_p + (1-\alpha)r\rho) \quad &\text{for the parent.} \end{aligned}$$

The unique subgame perfect equilibrium is given by the backwards induction equilibrium: in the second period, the parent decides to keep all the investment ($\alpha = 0$) and, knowing this, the migrant decides to invest only abroad. Then $\rho = 0$ and ρ^* satisfies:

$$-u_m'(w^* - \rho^*) + \beta r^* u_m'(w_m + r^*\rho^*) = 0.$$

In the absence of altruism, even if the migrant is willing to pay part of the extra return of the investment to the family in order to earn a higher return, the family has no incentive to return part of the investment to the migrant when he comes back. Given this, the migrant only invests at the foreign location. Obviously this outcome is not efficient since investments at home yield a higher return.

2.2 Social pressure at the family level

Let us assume now that the players can punish or reward each other. To make the model as simple as possible, each individual has to assign a value of θ equal to one (reward) or zero (punish) to any other individual. The average of all θs assigned to an individual is his social acceptance index, Θ_j for $j = e, p$.[6] There are still only two players, the migrant and his parent, and therefore Θ_j is the θ assigned by the other player to player $j = e, p$.

The utility functions of the migrant (u_m) and the parent (u_p) are now:

$$u_m = u_m(x_m^1, \Theta_m^1) + \beta u_m(x_m^2, \Theta_m^2) \quad (1)$$

$$u_p = u_p(x_p^1, \Theta_p^1) + \beta u_p(x_p^2, , \Theta_p^2). \quad (2)$$

As before, x_m^i is the consumption of a composite good by the migrant in period i and x_p^i is the consumption of the composite good by the parent in period i. Likewise, Θ_m^i is the social acceptance index for the migrant in period i and Θ_p^i is the social acceptance index for the parent in period i. Marginal utilities are positive and both utility functions are quasi-concave as before.

In the first period, there is no punishment for either player, since the players are in different locations (i.e., $\Theta_m^1 = \Theta_p^1 = 1$). In the second period players can reward or punish the other player. We allow for a revision of the players θs when a player rewards a player who punished him. This seems reasonable since whenever a player finds out that he is being punished by another player, he is likely to punish back. The timing of the game is as follows:

1 At the beginning of the first period, the migrant decides the amount to invest at the foreign location, ρ^*, and the amount to remit home to be invested, ρ. Both quantities are non-negative.

[6] We use the average because this way Θ is in [0,1] for any number of players in the game.

2a At the beginning of the second period, the migrant returns to the home location and the parent decides how much of the investment to keep ($(1-\alpha)r\rho$) and how much to return to the migrant ($\alpha r\rho$).

2b Having seen α, they simultaneously assign each other θ.

2c If one of the players decides to punish the other one while the other rewards him, the punished one can change his decision and punish in return.

The payoffs are given by the utility functions:

$$\begin{aligned} u_m(w^* - \rho^* - \rho, 1) + \beta u_m(w_m + r^*\rho^* + \alpha r\rho, \theta_{pm}) \quad & \text{for the migrant and} \\ u_p(w_p, 1) + \beta u_p(w_p + (1-\alpha)r\rho, \theta_{mp}) \quad & \text{for the parent,} \end{aligned}$$

where θ_{ij} is the social acceptance given by player i to player j.

Let the strategy of any player in [2c] be that if they are punished, then they punish back. This means that is $\theta_{ij} = 0$ then $\theta_{ji} = 0$ also. It does make sense that if one is punished by another member of the community, the natural thing to do is punish to him back. We continue to make this assumption throughout the rest of the paper.

To find the subgame perfect equilibrium of this game, we have to look at the subgame starting in [2b]. Given the above assumption, for any value of ρ and α the subgame is similar to the following static game in normal form:

			blackParent	
			blackReward	blackPunish black
black	black	Rewardblack	1,1black	0,0black
Migrant		Punishblack	0,0black	0,0black

There are two Nash equilibria in this game *(Reward, Reward)* and *(Punish, Punish)*. However, *(Punish, Punish)* is not a *trembling-hand perfect equilibrium*[7] and we can eliminate it as a likely equilibrium. Note that the strategy *Punish* is weakly dominated for both players and both players would be better off with the *(Reward, Reward)* equilibrium.

[7]This basically means that if we allow a small probability of the players making a mistake in their actions, then they would not play that equilibrium. See definition 8.F.1 on page 258 of Mas-Colell et al., 1995.

Given that the only robust equilibrium of the subgame starting in [2b] is ($\theta_{ep} = 1, \theta_{pe} = 1$). Then, as in section 2.1, the only subgame perfect equilibrium[8] is, $\alpha = 0$, $\rho = 0$ and ρ^* satisfying the equation:

$$-\frac{\partial u_m(w^* - \rho^*, 1)}{\partial x_m} + \beta r^* \frac{\partial u_m(w_m + r^*\rho^*, 1)}{\partial x_m} = 0. \tag{3}$$

So the equilibrium of this game will be again that the migrant does not send remittances because the parent would keep them if he does and every player rewards the other player.

2.3 Social pressure at the community level

We have found that, in the absence of altruism, we cannot find a robust equilibrium in which the migrant will send remittances for investment. We now introduce new families over time. To avoid problems of coordination, we are shall have only two families coexisting in each period. The composition of each family and the timing within the family are the same as in section 2.2.

Each family (except for the very first one) has to coexist with two other families: in the first period for the family (while the migrant is abroad), they have to coexist with a family made up of the returning migrant and his parent. For the second period (when the migrant has returned), they have to coexist with a younger family made up of the migrant abroad and his parent. That is, in each period there are going to be four players: A returning migrant and his parent, and a migrant abroad and his parent. A family that has played for two periods disappears and it is replaced by a new family.

The game is played ad infinitum by an infinite number of families. If we number the families by the first period they play (family n is the family whose migrant is at the foreign location in period n), we will add a subscript n to our notation. For example, for migrant n, consumption in his first period in the game (that is, when the migrant is abroad) is x^1_{en}. Also migrant n (or M_n) is the migrant of the n^{th} family and parent n (or P_n) is the parent of the n^{th} family.

Utility functions are given equation (2), where Θ_i is the average of the social acceptances (θs) given to the player i.

[8] That survives trembling-hand perfection.

As before, when at the foreign location, the migrant has $\Theta = 1$ since there is no reason (nor way) to punish him, and he does not reward or punish anyone.

Using $n = 2, 3, 4, 5, ...$ we can describe the timing of the game as follows:

1 At the beginning of first period, there is only one family. M_1 decides the amount to invest at the foreign location, ρ_1^*, and the amount to remit home to be invested, ρ_1. Both quantities are non-negative.

n a At the beginning of each period, M_{n-1} returns to the home location and P_{n-1} decides how much of the investment to keep ($(1-\alpha_{n-1})r\rho_{n-1}$) and how much to return to the migrant ($\alpha_{n-1}r\rho_{n-1}$).

n b Having seen α_{n-1}, M_{n-1} and P_{n-1} simultaneously assign θs.

n c Having seen all actions up to [n b], P_n assigns θs.

n d If one of the players decides to punish another while the other rewards him, the punished one can change his decision and punish in return.

n e Having seen all θs awarded, M_n has to decide the amount to invest at the foreign location, ρ_n^*, and the amount to remit home to be invested, ρ_n. Again, both quantities are non-negative.[9]

Payoffs for family n are:

$$\begin{aligned} u_m(w^* - \rho_n^* - \rho_n, 1) + \beta u_m(w_m + r^*\rho_n^* + \alpha_n r\rho_n, \Theta_{m_n}^{(n+1)}) \quad &\text{for } M_n \text{ and} \\ u_p(w_p, \Theta_{p_n}^n) + \beta u_p(w_p + (1-\alpha_n)r\rho_n, \Theta_{p_n}^{(n+1)}) \quad &\text{for } P_n. \end{aligned}$$

A subgame perfect equilibrium of this game is, as before, no punishments, no remittances, $\alpha_n = 0 \forall n$ and ρ_n^* satisfying equation (3).

There are, however, incentives for the parent of the migrant who is abroad (P_n at time n) to punish the parent of the returning migrant (P_{n-1}) if they keep too much of the investment (low value of α_{n+1}). This is because the parent of the migrant abroad wants the migrant to remit as much as possible.

To find a subgame perfect equilibrium in which the migrant abroad sends a positive remittance, we first propose the strategies that each player has

[9] Even though time [n d] is after all other decisions are made, we assume times [n a] to [n d] are fast and [n e] takes place at the beginning of the nth period.

to follow and then proceed to find the conditions necessary for the subgame perfect equilibrium to exist. All the equilibrium we are going to look at are symmetric in the sense that all migrants choose the same strategy and all parents choose the same strategy also.

We begin with the case in which migrants do not invest any amount at the foreign location; i.e., $\rho_n^* = 0 \forall n$.

Using again $n = 2, 3, 4, 5, ...$, the proposed strategies are as follows:

M_1 Sends ρ^o to his parent at the beginning of the first period for it to be invested at home. At time [2b], if $\alpha_1 \geq \alpha^o$, then rewards his parent, otherwise punishes his parent. He also rewards P_2. At time [2d], if a player punished him while he rewarded that player in [2b], then he punishes back.

M_n He sends ρ^o at the beginning of the nth period to his parent for it to be invested at home (at time [n e]) unless three things happen together:

1. $\alpha_{n-1} < \alpha^o$,
2. P_n didn't punished P_{n-1}, and
3. either P_n didn't punish M_{n-1} or M_{n-1} didn't punish P_{n-1}.

At time [(n+1) b], if $\alpha_n \geq \alpha^o$, then he rewards his parent, otherwise he punishes his parent. Rewards P_{n+1}. At time [(n+1) d], if a player punished him while he rewarded that player in [(n+1) b], then he punishes back.

P_1 At time [2a], chooses $\alpha_1 = \alpha^o$. At time [2b], he rewards everyone. At time [2d], he punishes back anyone who punished him at [2b].

P_n At time [n c], if $\alpha_{n-1} < \alpha^o$, then he punishes P_{n-1}, otherwise he rewards P_{n-1}. If he punished P_{n-1} and M_{n-1} didn't punish his own parent in [n b], then he punishes M_{n-1} also, otherwise he rewards P_{n-1}. At time [(n+1) a], he chooses $\alpha_1 = \alpha^o$. At time [(n+1) b], he rewards everyone. At time [(n+1) d] he punishes back anyone who punished him at [(n+1) b].

First we check if the strategy of P_1 is consistent. P_1 will set $\alpha_1 = \alpha^o$ only if:

$$u_p(w_p + (1 - \alpha^o)r\rho^o, 1) \geq u_p(w_p + r\rho^o, 0). \tag{4}$$

Since the strategies of the other players are to punish him if $\alpha_1 < \alpha^o$, then he would have to be punished if he deviates from his strategy. It is clear that if he deviates, then he will return nothing to M_1. Note that if inequality (4) is satisfied, the rest of his strategy is consistent.

If the strategy of P_1 is consistent, that means that if everyone follows their strategy, P_1 will not deviate from his own, and will choose $\alpha_1 = \alpha^o$. For M_1 to be willing to follow his strategy, we need that:

$$\alpha^o r \geq r^*. \tag{5}$$

Note that he is willing to punish his parent (and punished by his parent in return) because otherwise he will be punished by P_2 and he is indifferent towards both punishments. Inequality (4) is less likely to hold for larger values of ρ^o. This means that if the migrant wants to invest a large enough quantity in the first period, he will find it optimal to invest also at the foreign location. The migrant determines ρ^o based on the first order conditions of his maximization problem and the restriction he has in (4).

The rest of the parents (P_n for $n = 2, 3, 4, 5, ...$) have to be willing to punish any parent that wants to deviate by keeping all the investment. Given the other strategies, P_n is willing to punish P_{n-1} if:

$$u_p(w_p, 1/2) + \beta u_p(w_p + (1 - \alpha^o) r \rho^o, 1) \geq u_p(w_p, 1) + \beta u_p(w_p, 1). \tag{6}$$

That is, if (6) is satisfied, then the parent is better off punishing (and being punished by) P_{n-1} today and receive part of the investments tomorrow, than not being punished but receiving zero remittances. We also need that the parents not to want to keep all the investment. It is clear that the parent is better off if he does not have to punish another parent, in which case he will be in the same situation as the P_1. So, if P_1 does not want to deviate and if P_n is willing to punish the deviant parent, then P_n's strategy is also consistent.

Finally, we have to check if M_n's strategy is consistent. If he knows that P_n is not willing to deviate, then he can play his strategy even in the case of P_{n-1} having deviated, unless P_{n-1} was not punished. If the rest of the players' strategies are consistent then M_n's strategy is also consistent.

Note that ρ^o is determined by the migrants and α^o by the parents, with the restriction that relations (4) to (6) hold. A high value of ρ^o makes relation (4) less likely to hold but relation (6) more likely to hold, this means that the values that ρ^o can take are bounded. The same happens with α^o, since

relationships (4) and (6) are less likely to hold for a large α^o but relationship (5) is more likely to hold.

The migrants can invest more than relationships (4) to (6) allow, but it will have to be at the foreign location. So, it is possible for us to observe remittances for investment and savings at the foreign location. In that case, the outcome of the game is not efficient. If the migrants only invest at home, then the outcome is efficient since they are investing where the returns are higher and there are no punishments.

These strategies form a subgame perfect equilibrium if relations (4) to (6) hold. In that case, the outcome we will see is as follows:

- Migrants remit to their parents for investment and for *parent's consumption.*
- There are no punishments in equilibrium and the parents give back most of the investment to the returning migrant.
- If the wage differential between both locations is large enough, then the migrant may find it optimal to invest in both locations.
- Better investment opportunities (larger r), will result in larger remittances but not always in more investment.[10] This is because $(1 - \alpha^o)$, the proportion kept by the parent, can increase when investments at the home location are better.

3 Empirical implications

This model has a number of empirical implications. The first is that, even in the absence of altruism, we might observe remittances for investment but also remittances for the families to spend on whatever they wish.

The model is also consistent with seeing returning migrants who sent remittances for investment and go back with savings.

This model fits best in communities where ties with the rest of the community are important. We might expect the model to apply better to smaller communities where losing friendships might be worse than in larger communities where people may create new relationships more easily. Also, the importance of the extended family might be important for larger remittances.

[10] As we mentioned above, we are assuming that the parent also invests his share, but he could also consume it in the first period.

Note that all the empirical implications of the model can also be interpreted as the presence of altruism, even though they are the result of a model without it.

This model's results depend on the return of the migrant. One possible implication of the model is that the results are more likely to appear in situations where there is a high probability of return migration. Hence we could conclude that our results are more likely in international migration than in internal migration, or in illegal migration than legal migration.

4 Conclusions and possible extensions

We have shown that, even if no altruism is present, it is possible that remittances for investment and for consumption by the family of the migrant can be seen in equilibrium. This, of course, does not rule out altruism which would make it easier for remittances of this type to be seen but shows that it is not necessary in all cases for the family to display altruism towards the migrant.

The main assumption in the model is that people in a town can put pressure on other people in the town in order to obtain some benefits. Our results show that, in the absence of altruism, we can have a game in which we observe people behaving as if they where altruistic in equilibrium.

There are some possible extensions for this paper. One is to look at how social pressure in the foreign communities can affect remittances and return migration. Another is to model how peer pressure can affect the migrant's behaviour to possibly make him send remittances for present consumption even in the absence of altruism.

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